



Republic of Yemen
Ministry of Water and Environment
Environment Protection Authority

National Capacity Self-Assessment (NCSA) Project



NCSA REPORT AND ACTION PLAN FOR ENVIRONMENTAL CAPACITY DEVELOPMENT



JANUARY, 2008



National Capacity Self-Assessment (NCSA) Project

NCSA REPORT AND ACTION PLAN
FOR
ENVIRONMENTAL CAPACITY DEVELOPMENT

JANUARY, 2008

I. ACKNOWLEDGMENT

Preparation of the National Capacity Self Assessment (NCSA) project has been made possible with support and contributions of several institutions and individuals. The Environment Protection Authority (EPA) acknowledges the contributions of all those who participated in the process of developing this report. EPA is grateful to the Global Environment Facility (GEF) for the financial support provided for this process through the United Nations Development Program (UNDP).

The Project is grateful to EPA, Chairman for continued administrative support during the project life period. Thanks also goes to the three Focal Points for the project thematic areas namely, the Convention on Biological Diversity (CBD), United Nations Convention to Combat Desertification (UNCCD), and United Nations Framework Convention on Climate Change (UNFCCC), as well as the team of national consultants for their contribution during the whole NCSA process.

Special thanks are extended to all stakeholders and individuals in the following institution for their contribution during the consultation process: Ministry of Water and Environment (MWE), Ministry of Planning and International Cooperation, Ministry of Electricity and Energy (MEE), Marine Science Research Authority (MSRA), Ministry of Agriculture and Irrigation, Agricultural Research and Extension Authority (AREA), General Department of Forestry and Combating Desertification (GDFCD), United Nations Development Program (UNDP), the Universities of Sana'a and Aden, the Non Governmental Organizations (NGOs) and all individuals who participated in all the NCSA meetings and workshops.

NCSA Project Management



II. FORWARD

Yemen is a least developing country that relays on its limited natural resources in the economic and social development and the Government believe that sustainable management of natural resources is of great important to achieve sustainable development, and as a signatory to MEAs and the Government willing to implement the commitments of these agreements.

However, it was clear that the most important challenge to fulfill obligations and commitments stipulated in the conventions was found to be the lack of or inadequate capacity technical and financial.

The MEAs provide an opportunity to achieve national development objectives through promotion of partnerships, technology transfer and capacity building for sustainable natural resource management.

The NCSA Project was a result of the Global Environment Facility (GEF) Capacity Development Initiative, which aimed at making broad assessments of capacity building needs. However, the goal of the Yemen NCSA is to determine the priority needs and to establish a plan of action for developing national capacity to meet commitments at national and global environmental challenges.

The policy restructuring proposed by NCSA action plan will ensure close linkages and synergies with on-going restructuring initiatives.

Conservation of environment, however, requires full participation of multiple stakeholders, who may bring to bear their respective resources, competencies, and perspectives for full implementation of environmental policies. Recognizing this fact, the NCSA action plan calls for adoption of participatory approaches in planning natural resources at both central and local levels.

The NCSA aimed to enable governmental and nongovernmental environmental institutions to work together in addressing environmental issues and implement the recommendations of this project. The **implementation strategies** to achieve this target involve, among others, establishment of inter-sectoral collaboration mechanisms, and inclusion of environmental NGOs, business sectors, and local communities in environmental management.

I would like to express my sincere thanks to the GEF and UNEP for financial and technical support. Especial thanks also to all national consultants and staffs who contribute in preparation of this project.

Prime Minister

Dr. Ali Mohamed Mougaur



III. PREFACE

The issue of capacity building has become a major priority to the Global Environment Facility (GEF), within the global conventions and the international community as a whole. Yemen is a signatory to a number of Multilateral Environmental Agreements (MEAs) including the Rio Conventions on biological diversity, climate change and desertification. However, the country's capacities to meet its obligation towards implementing these conventions are limited at different levels. It was considered appropriate to build capacity of the country while the Rio Conventions are in different stages of implementation. During early stage of implementation, it was clear that there are needs for technical and human resources. Technical capacity need is crucial to enhance capacity of the country to take part in the global negotiation processes and link decisions taken at the global level to match actions at the country level. Enough qualified and trained national staff ensure successful implementation of NCSA and develop country capacity in a sustainable manner. Identifying capacity building needs at all the three levels (individual, institutional and systemic) and strengthening existing capacities are urgently needed.

The focus of this project was to identify the concerns related to critical capacity constraints for implementing the MEAs; formulate strategic plan how to develop national capacity for thematic issues as well as issues that cut across focal areas; increase awareness on various issues with regard to national capacity for the MEAs; and link past and ongoing activities for the MEAs with overall national development policies. The NCSA Project examines the issue of sustainable development and develop a national strategy for sustainable development. The Project therefore seeks to develop a planned and coordinated activities to achieve high performance in implementing MEAs.

The Yemen NCSA is a living document own by the stockholders through an extensive consultative process and reflected examination for the way forward in sustainable development for the country. That is, the integration of the environmental, economic and social facets of the decision-making process and finding ways for more in-depth collaboration and cooperation, between related ministries and agencies. The priority needs to develop country's capacity to fulfill global environmental objectives and to ensure sustainable development for Yemen as well based on its own criteria and priority issues.

It was prepared through an extensive consultative process. With the concerned ministries, Government agencies, research institutions, academics from the universities, civil societies, NGOs, development partners, experts, environmental practioners, press as well as other relevant stakeholders involved in this process. Final NCSA document was submitted to the final national workshop for wide discussion to reach its final stage and placed for approval.

Minister of water and environment

Abdulrahman F. Alaryani



IV. PREFACE

Republic of Yemen has signed and ratified a number of Conventions and protocols on environment, including CBD, UNCCD and UNFCCC, which were the focus of the National Capacity Self Assessment (NCSA) project.

The Environment Protection Authority (EPA) is pleased to present the NCSA report. The Project was a result of the Global Environment Facility (GEF) Capacity Development Initiative (CDI), which aimed at making broad assessments of capacity building needs of developing countries and countries with economies in transition to address global environment issues. Yemen was eligible for this funding and, fitted in all other eligibility requirements for GEF funding.

I would like to extend my sincere thanks to the GEF and UNDP for financial and technical support, and to the expert and all stakeholders who participated and provided input in the preparation of this report.

The project, through a highly consultative process, has identified gaps and priority needs for capacity building in the country at various levels, to help implement global environmental conventions, mainly focusing on CBD, UNCCD and UNFCCC. The project also identified the cross cutting issues and overlaps between these conventions and proposals to build on the synergies have been made.

The implementation of the recommendations contained in this report requires involvement and participation of everyone. It provides an opportunity to enhance implementation of the MEAs in Yemen for the benefit of the present and future generations.

EPA, Chairman

Mahmoud M. Shidiwah

V. ACRONYMS

AREA	Agricultural Research and Extension Authority
CAMA	Civil Aviation and Meteorology Authority
CBD	Convention of Biological Diversity
CBOs	Community Based Organizations
CC	Coordination Committee
CCD	Convention on Combat Desertification
CCU	Climate Change Unit
CDI	Capacity Development Initiative
CDM	Clean Development Mechanism
CITES	Convention on International Trade in Endangered Species
CO ₂	Carbon Dioxide
CSMP	Civil Service Modernization Project
CSOs	Civil Society Organizations
EIA	Environmental Impact Assessment
EPA	Environment Protection Authority
EPL	Environment Protection Law
EQPC	Earth Quake Prediction Center
ESR	Environment Status Reports
EU	European Union
FFYP	First Five-Year Plan
FNC	First National Communication
GDFCD	General Department of Forestry and Combating Desertification
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gases
GIS	Geographical Information System
GOY	Government Of Yemen
GRC	Genetic Resources Center
HDSRP	Human Development Strategy and Recruitment Plans
ICT	Information and Communication Technology
LMOs	Living Modified Organisms
LPG	Liquid Petroleum Gas
M&E	Monitoring and Evaluation
MAI	Ministry of Agriculture and Irrigation
MCS	Ministry of Civil Service
MDGs	Millennium Development Goals
MEAs	Multilateral Environmental Agreements
MEE	Ministry of Electricity and Energy
MFW	Ministry of Fish Wealth
MITC	Ministry of Information Technology and Communication
MLA	Ministry of Legal Affairs
MOC	Ministry Of Construction
MOE	Ministry Of Education
MOHE	Ministry Of Higher Education
MOI	Ministry Of Information
MPIC	Ministry of Planning and International Cooperation
MSRA	Marine Science Research Authority



Final Report and Action Plan for Environmental Capacity Development

MWE	Ministry of Water and Environment
NAPA	National Adaptation Program of Action
NAPCD	National Action Plan to Combat Desertification
NBSAP	National Biodiversity Strategy and Action Plan
NCSA	National Capacity Self Assessment
NEAP	National Environmental Action Plan
NEIC	National Environmental Information Center
NGOs	Non-Governmental Organizations
NMP	National Mitigation Plan
NPC	National Project Coordinator
NSES	National Strategy for Environmental Sustainability
NWRA	National Water Resources Authority
POPs	Persistent Organic Pollutants
PRSP	Poverty Reduction Strategy Paper
R&D	Research and Development
RAMSAR	Convention for the Conservation of Wetlands
RNRRC	Renewable Natural Resources Research Center
SFYP	Second Five-Year Plan
SNRMP	Sustainable Natural Resources Management Programme
TFR	Total Fertility Rate
UNCCD	United Nation Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank
WRA	Water Rural Authority



VI. TABLE OF CONTENTS

I.	ACKNOWLEDGMENT	3
II.	FORWARD	4
III.	PREFACE	5
IV.	PREFACE	6
V.	ACRONYMS	7
VI.	TABLE OF CONTENTS	9
VII.	EXECUTIVE SUMMARY	11
1	INTRODUCTION	25
1.1	NATIONAL CAPACITY SELF-ASSESSMENT (NCSA)	25
2	NCSA PROCESS AND METHODOLOGY IN YEMEN	28
2.1	INCEPTION PHASE	28
2.2	THEMATIC ASSESSMENT PHASE	29
2.3	IDENTIFICATION OF SYNERGIES AMONG THE MEAS	31
2.4	ACTION PLANNING PHASE	31
3	GLOBAL ENVIRONMENTAL MANAGEMENT IN YEMEN	32
3.1	COUNTRY CONTEXT	32
3.1.1	<i>Geographic Location and Land Area</i>	32
3.1.2	<i>Climate</i>	33
3.1.3	<i>Population</i>	33
3.1.4	<i>Gender Policies</i>	33
3.1.5	<i>Education</i>	34
3.1.6	<i>National Economic Features</i>	34
3.1.7	<i>Land Resources and Land Use</i>	34
3.1.8	<i>Biodiversity</i>	35
3.1.9	<i>Water Resources</i>	35
3.1.10	<i>Energy</i>	36
3.2	KEY COMMITMENTS AND ACTIONS	37
3.2.1	<i>The Poverty Reduction Strategy Paper (PRSP) 2003 – 2005</i>	37
3.2.2	<i>Vision 2025</i>	37
3.2.3	<i>The Millennium Development Goals</i>	38
3.2.4	<i>National Environmental Plans</i>	38
3.2.5	<i>Environmental Programmes</i>	41
3.2.6	<i>Legal Frameworks Supporting MEAs Implementation and Environmental Management</i>	43
3.2.7	<i>Institutional Framework</i>	43
3.2.8	<i>Environment Status Reports (ESR) 2005</i>	45
3.2.9	<i>Civil Service Reform</i>	45
4	KEY CAPACITY GAPS AND CONSTRAINTS	46
4.1	UNSUSTAINABLE USE AND MANAGEMENT OF NATURAL RESOURCES	46
4.1.1	<i>Desertification</i>	46
4.1.2	<i>Biodiversity Loss</i>	47
4.1.3	<i>Weak Capacity to Mitigate and Adapt to Climate Change Issues</i>	48



4.2	CROSSCUTTING CAPACITY ISSUES	50
4.2.1	<i>Weak Planning Capacity of Natural Resources</i>	51
4.2.2	<i>Inadequate Funding for Delivery of Environmental Policies</i>	51
4.2.3	<i>Inadequate Institutional and Legislative Frameworks</i>	51
4.2.4	<i>Weak EIA Enforcement</i>	52
4.2.5	<i>Ineffective Manpower to Handle Emerging Environmental Issues</i>	52
4.2.6	<i>Limited Environmental Research</i>	53
4.2.7	<i>Weak Information Base</i>	53
4.2.8	<i>Low Public Awareness of Environmental Issues</i>	54
5	GOAL AND STRATEGIC OBJECTIVES	55
5.1	STRATEGIC OBJECTIVES	55
5.2	THE SCOPE OF THE ACTION PLAN	55
6	FRAMEWORK OF ACTIONS, EXPECTED RESULTS, AND IMPLEMENTATION STRATEGIES	56
6.1	POLICY DEVELOPMENT AND PLANNING	56
6.1.1	<i>Policy Integration</i>	56
6.1.2	<i>Participatory Planning of Natural Resources</i>	58
6.1.3	<i>Community Involvement in Environmental Planning</i>	59
6.1.4	<i>Resource Mobilization</i>	60
6.2	INSTITUTIONAL AND LEGISLATIVE STRENGTHENING	61
6.2.1	<i>Institutional Restructuring</i>	61
6.2.2	<i>Cross-sectoral Cooperation</i>	63
6.2.3	<i>Human Resources Development</i>	65
6.2.4	<i>Strengthening EIA and Law Enforcement</i>	66
6.2.5	<i>EIA Enforcement</i>	68
6.3	RESEARCH AND TECHNOLOGY DEVELOPMENT	68
6.3.1	<i>Stimulation of Integrated Researches</i>	68
6.3.2	<i>Strengthening Environmental Monitoring and Disaster Preparedness</i>	70
6.3.3	<i>Data and Information Collection, Dissemination and Monitoring</i>	72
6.4	RISING ENVIRONMENTAL AWARENESS AND EDUCATION OF YEMENI SOCIETY	73
6.4.1	<i>Raising Environmental Awareness</i>	73
6.5	CONSERVATION AND SUSTAINABLE USE OF NATURAL RESOURCES	75
6.5.1	<i>Sustainable Land Use</i>	75
6.5.2	<i>Conservation and Sustainable Use of Biodiversity</i>	78
6.5.3	<i>Biosafety</i>	79
6.6	SUSTAINABLE CLIMATE CHANGE AND ENERGY MANAGEMENT	80
7	ANNEXES	83
7.1	ANNEX (1): NCSA ACTION PLAN:	84
7.2	ANNEX (2): THEMATIC ASSESSMENT ISSUES\ GAPS ANALYSIS:	100
7.2.1	<i>Desertification Issues\ Gaps:</i>	100
7.2.2	<i>Biodiversity Issues\ Gaps:</i>	108
7.2.3	<i>Climate Change Issues\ Gaps:</i>	120
7.3	ANNEX (3): CROSS CUTTING ENVIRONMENTAL ISSUES\ GAPS ANALYSIS.	130
7.4	ANNEX (4): PROJECT PROFILES:	137
7.5	ANNEX (5): PAST AND ON-GOING ENVIRONMENTAL PROJECTS:	168
7.6	ANNEX (6): TABLES OF ENVIRONMENTAL LAWS AND BYLAWS PRODUCED BY THE GOVERNMENT:	174
7.7	ANNEX (7): LIST OF NATIONAL CONSULTANTS:	175

VII. EXECUTIVE SUMMARY

The goal of the Yemen NCSA is to determine the priority needs and establish a plan of action for developing Yemen's capacity to meet its commitments for national and global environmental management. NCSA was a highly participatory and consultative process that produced number of technical reports with a primary focus on capacity needs assessments in the three main areas: biodiversity conservation, climate change and desertification, land degradation, particularly in the context of MEAs compliance and implementation of the National Environmental and Action Plan (NEAP) as a policy document highly linked to the said thematic areas. This Action Plan for Environmental Capacity Development is the final product of the NCSA and is based on three earlier assessment reports **(included in the Annex 2)** addressing the following:

- Thematic situation assessment reports on the status of MEAs implementation in Yemen.
- Thematic profiles highlighting priority capacity needs for implementation of the MEAs. and
- Areas of synergies for enhanced implementation of the MEAs.

The NCSA project implementation was initiated by Environment Protection Authority (EPA) in 24th of September 2005, stakeholders were identified, extensive consultations and workshops held, stocktaking and thematic reports produced and cross-cutting analysis completed leading to this final document that presents the National Action Plan for Environmental Capacity Development in Yemen.

NCSA process had been conducted in consultation with all key stakeholders and the implementation of NCSA activities were guided by the Environment Protection Authority (EPA) in cooperation with Ministry of Planning and International Cooperation, Ministry of Agriculture and Irrigation, Ministry of Fish Wealth, National Water Resources Authority (NWRA), the Ministry of Water and Environment (MWE), the Ministry of electricity and energy, the United Nations Development Programme (UNDP), and the Environmental Supporters Society, a Non-Governmental Organization (NGO). The EPA and UNDP appointed a Project Coordinator to follow up day-to day project implementation via shortlist interview based on wide national announcement for the position. Under the National Project coordinator, the EPA convened three thematic tasks forces –to systematically undertake situational analyses and capacity needs assessment with regard to implementation of the three thematic areas, UNFCCC, the CCD and the CBD conventions. Each task force was composed from a team leader assisted by 3-4 national consultants specialized in the respective thematic areas **(See list of experts in Annex 7)**. Overall all activities were coordinated closely with UNDP/GEF funded NCSA project. Total budget allocation for the project was \$200,000 which was fully granted from GEF.

Yemen first step towards meeting the country obligations under the “Rio Conventions” (i.e., the CBD, CCD, and UNFCCC) was in 1996 when the EPA in cooperation with World Bank launched the National Environment Action Plan (NEAP) aiming at addressing the following priority environmental issues:

- Water depletion, pollution and supply.
- Land degradation, including desertification.
- Habitat degradation, covering biodiversity loss.
- Waste management.

This first NEAP formed the basis for the environmental chapters in the Five Year Development Plan for the period 1996-2000, and for international technical assistance over same period and the subsequent five years. Over this period the Government in cooperation with international donors has made remarkable efforts in implementing NEAP activities and this joint efforts have led the following are most important results of these efforts:

1. Formulation of Eco-tourism strategy.
2. Identification of fifteen protected areas.
3. Declaration of five nature reserves as protected areas.
4. Formulation and implementation of five management Plans (for Socotra islands, Aden wetlands and Jbal Bura’a conservation zones).
5. Formulation and implementation of three coastal zone Management Plans for Aden, Balhaf, and Jathmon-Sherma.
6. Enactment of management bodies for four protected areas.
7. Establishment of ecotourism department.
8. Conducting flora and Fauna surveys, and socio-economic studies for Socotra islands, Aden wetlands, Jabal Bura’a, Bir Ali-Broum, Sherma-Jatmoon and Hawf conservation zones.
9. Studies on Yemen flora and fauna, coastal habitat, agro-biodiversity, socio-economic, and traditional practices.
10. Surveys of marine habitats and resources of the Red sea.
11. Establishment of GIS system for the red sea coastal area.
12. The biodiversity conservation zoning plan for Socotra archipelago.
13. Master plan for Development of Socotra Archipelago of protected areas, and forest conservation in.
14. Establishment databank and genetic resources unit in AREA.
15. Desertification and land degradation maps.
16. Watershed database and maps.
17. Implementation of several programmes on desertification, sand dune stabilization and the regeneration of watersheds etc...

In 2007 NEAP implementation was assessed and based on which the government developed NEAP II which deals with emerging priority environmental issues such as: water depletion, pollution and supply, over extraction of ground water, lack of water allocation and conservation systems, water pollution, inadequate water supply services, land degradation, soil erosion, deforestation, agricultural and range land deterioration, loss of farm land due to urban encroachment, habitat degradation, degradation of natural habitats (forests, wetlands, coastal habitats), loss of biodiversity (extinction of endemic, rare and endangered species), lack of management of ecotourism, waste management, solid waste management, hazardous waste management, and pesticide management.



Besides NEAP development, Yemen has taken a number of measures to conserve environmental and improve natural resources management. These measures culminated in the adoption of the National Water Strategy, the Third National Development Plan and the Poverty Reduction strategy Paper.

More importantly, Yemen's commitment to implementation of the RIO conventions is reflected in the signing and ratification of the following instruments.

- The United Nations Framework Convention on Climate Change (UNFCCC), February 1996.
- The Convention on Biodiversity Convention (CBD), February 1996.
- The Desertification Control Convention (CCD), January 1997.
- Basel Convention on Transboundary Movement of Hazardous Waste.
- Vienna Convention on Protection of Ozone Layer.
- Convention on International Trade on Endangered Species.
- Stockholm Convention on Persistent Organic Pollutants (POPs).

Under UNFCCC, key activities include the production of National Adaptation Program of Action (NAPA), the First National Communication (FNC), the GHG inventory, mitigation analysis, policy frameworks for the reduction of GHG emissions and the enhancement of forest sinks.

Under the CBD, key activities include preparation of the National Biodiversity Strategy and Action Plan (NBSAP) in 1999, the submission of first report on the status of biodiversity, the biosafety frameworks, implementation of several projects on biodiversity conservation and protected area.

To meet its commitment under the CCD, the government completed the National Action Plan to Combat Desertification (NAPCD) in November 2000 and subsequently formulated the Second National Report on the Implementation of UNCCD/NAP In April 2002. The NAPCD examines the direct and indirect causes of desertification; physical and sociological aspects of desertification; and identify desertification policies and programs, and action plan to combat desertification.

Thematic Assessments:

The NCSA identified national capacity constraints and priorities to meet binding commitments contained in the UNFCCC, CBD, and CCD conventions. **(See thematic assessment matrix in Annex 2).**

Capacity development options were highlighted and prioritized as follows:

1. Desertification:

The thematic assessment conducted for desertification highlighted the following priority capacity constraints hindering the attainment of meeting UNCCD commitments:

- Weak institutional capacity to implement the UNCCD.
- Weak planning capacity of desertification issues.
- Inadequate policy, legal and enabling frameworks.
- Weak cooperation and networking with international organizations.
- Unsustainable management of land resources.
- Limited public education and awareness of UNCCD issues.

- Limited integrated research in on land degradation.
- Inadequate monitoring of land degradation.
- Inadequate information and data collection, analysis and dissemination.
- Lack of drought and other disaster management plans.
- Lack of integrated plans for management of rangelands.
- Insufficient opportunities for alternative livelihood systems.
- Lack of financial resources and poor infrastructure.

2. Biodiversity:

The biodiversity thematic assessment identified the following priority capacity constraints hindering the country from fully meeting its obligations under the CBD convention:

- Weak enforcement of policies and legislations related to the conservation and sustainable use of Biodiversity.
- Weak in the ability to collect and document the Genetic Resources and regulate their use.
- Insufficient enforcement of EIA in development Projects.
- Weak capacity in Protected Areas Management.
- Weak National Capacity to protect ex-situ biodiversity components.
- Inadequate studies and inventories on biodiversity components.
- Low social consciousness in the issues of conserving and protecting biodiversity.
- Weak capacity in preparing, implementing plans and programs and reporting in biodiversity.
- Limited Research activities and training in biodiversity.
- Lack of using modern technologies in biodiversity and Biosafety.
- Weakness in technical and scientific collaboration as well as exchange of information at local, regional and international levels in the field of Biodiversity.
- Lack of vision and incentives for protection and sustainable use for biological diversity.

3. Climate Change:

The thematic assessment conducted for climate change identified following priority capacity constraints hindering the country from fully meeting its obligations under the UNFCCC convention:

- Weak institutional structure of climate change unit.
- Inadequate policy framework for integrating change issues in the national development planning.
- Limited capacity to formulate and plan climate change issues.
- Inadequate policy and legal framework and weak law enforcement.
- Weak general foundation for regularly updating and publishing national GHG inventories and projections on self-reliant basis.
- Limited reporting capacity to regularly update national communication meeting overall all needs and covering all areas as stated by the conventions.
- Limited Climate Change related Research.

- Inadequate capacity for promoting educational programs, conducting public awareness campaigns and Programme on Climate change themes.
- Inadequate capacity to plan and adapt against the negative impact of climate change.
- Lack of funding for implementing climate change Programs.

Cross-cutting Issues:

The major constraints identified by the NCSA process were entirely cross-cutting for the three thematic areas (See Annex 3) and, therefore, merit a synergistic intervention approach concluded after wider discussion with stakeholders in two different provinces in two workshops which includes to the following:

- Weak planning capacity of natural resources.
- Weak Information base.
- Weak scientific and technical cooperation and information exchange.
- Inadequate funding for delivery of environmental policies.
- Inadequate institutional and legislative frameworks.
- Weak EIA enforcement.
- Ineffective Manpower to handle emerging environmental issues.
- Limited environmental researches.
- Inadequate Monitoring and Evaluation (M&E) mechanisms.
- Low public awareness of environmental issues.
- Unsustainable Natural resources management.
- Weak capacity to mitigate and adapt to climate change issues.

Scope of NCSA Action Plan:

Based on review and analysis of capacity intervention options contained in the three thematic assessment reports, the national stakeholders in the Sixth and Seventh workshops dated 14 and 21 November 2007 categorized overall interventions of three thematic areas either as synergistic or convention specific capacity interventions. The synergetic capacity interventions were then re-prioritized and re-clustered under the following synergistic capacity building intervention areas:

1. Policy Development and planning.
 - Resource mobilization.
2. Institutional and legislative strengthening.
3. Research and technology development.
 - Data and information collection, dissemination and monitoring.
4. Rising environmental awareness and education of Yemeni society.

The conventions specific priority capacity building interventions were regrouped under the following convention specific capacity areas:

1. Sustainable use of natural resources.
2. Sustainable climate change and energy management.

Goal, Strategic Objectives and Implementation Strategy:

The goal of the Yemen NCSA is to determine the priority needs and establish a plan of action for developing Yemen's capacity to meet its commitments to national and global environmental management.

POLICY DEVELOPMENT AND PLANNING:

Strategic objective 1: Strengthening the performance of environmental policies through the promotion of participatory national and local planning of natural resources:

Policy Integration:

Output 1.1: Integration of environmental concerns in policies, plans, programmes, and projects for economic and social development.

Actions:

- Development of guidelines for mainstreaming environmental issues in the national and district development plans.
- Readjustment of Yemen policies in line with MDG and environmental priority needs.
- Review and update of watershed management plans and marine and coastal management plans.
- Review and update of land use, water and land tenure policies.
- Formulation Adaptation Programme of Action- on climate change.
- Formulation and application action plan for rehabilitation of degraded natural habitats.
- Revival of best traditional knowledge of herding practices and rotational use of ranges.

Expected results will include, among others, the following:

- Guidelines for mainstreaming environmental issues into the national and district development plans.
- National environmental policies harmonized in line with Yemen MDGs, national priorities, and MEAs requirement.
- Integrated management approaches widely applied in natural resources planning at both national and district levels.

Participatory Planning of Natural Resources:

Output 1.2: Promotion of participatory national planning of natural resources.

Actions:

- Stimulating and expanding public partnerships in the planning and management of natural resources.
- Expand youth role in environmental protection through supporting youth clubs.

Expected results will include, among others, the following:

- A nationwide societal partnership in planning and management of the natural resources.
- Mobilization of optimal resources from all sectors of society.
- Increased government- public trust, and good governance in natural resources management as a result of government-community partnerships.

Community Involvement in Environmental Planning:

Output 1.3: Strengthening local community involvement in planning the protection of environmental resources.

Actions:

- Promote community-based planning model over management of natural resources.
- Promote sustainable livelihood approaches in the management of nature reserves.

Expected results will include, among others, the following:

- Enforcement of local council law No.4 as results of shifting to community-based planning model in managing natural resources.
- Significant change in community attitudes towards environment as a result of moving to decentralized management in protected areas, rangeland and coastal zones.
- The livelihoods of local community adequately considered when protecting nature reserves.
- Indigenous knowledge widely applied in management of natural resources.

Resources Mobilization for Policy Execution:

Output 1.4: Strengthening resource mobilization capacity of MEAs focal points through enhanced awareness, information base, and capacity building.

Actions:

- Raise awareness of public and policy makers on conventions and funding mechanism of MEAs.
- Capacity building on resource mobilization, planning and Project formulations and negotiation skills.
- Capacity building on strategic planning and Project formulations.
- Provide financial support for local communities livelihoods and programmes.
- Establish national information center for MEAs focal points and provide training on data base, and networking.

Expected results will include, among others, the following:

- Better articulation of environmental policies as a result of enhanced capacity on strategic planning and enhancement of information base.
- More accessible resources for implementation of environmental policies due to increased policy makers' awareness on MEAs conventions and their eligibility requirements for funding MEAs projects.

INSTITUTIONAL AND LEGISLATIVE STRENGTHENING:

Strategic objective 2: Rationalization of legislative and regulatory frameworks for effective environmental protection:

Institutional Restructuring:

Output 2.1: Streamlining internal structure of environmental agencies.

Actions:

- Review and harmonize mandates of relevant agencies.
- Review and amend organization structure and job description of relevant agencies.
- Prepare by-laws/internal operation system.

Expected results will include, among others, the following:

- Mandates, role, and responsibilities of environmental agencies harmonized.
- Organization structures, job descriptions, by-laws/internal operation for environmental agencies clarified.
- Enhanced relationships among environmental actors for enforcement of natural resource laws and policies.

Cross-sectoral Cooperation:

Output 2.2: Strengthening environmental management through integrated and participatory management of natural resources at central and local level.

Actions:

- Promote participation of local authorities, community-based groups and private sector in environmental management.
- Create appropriate coordination bodies for management and use of natural resources at both national and local levels.
- Prepare by laws for smooth functioning of the coordination committees.
- Create environmental NGOs at local and central levels to act as advocacy groups to support environment protection.
- Activate private community involvement in environmental management through enforcement of contractual and concession policies.

Expected results will include, among others, the following:

- Effective delivery of environmental laws and policies due to enactment of agreed-upon inter-institutional collaboration mechanisms.
- Maximum resources ensured for implementation cross-cutting issues.
- Increased advocacy for MEA issues and sensitization of the private sector on their role in implementation of MEAs.

Human Resources Development:

Output 2.3: Strengthening manpower performance through systematic capacity building and motivation.

Actions:

- Gap assessment of manpower.
- Establish national data base for human resources.
- Training needs assessment.
- Prepare human development strategy and recruitment plans.
- Implement capacity building programs.

- Establish staff performance and control/appraisal system for the public administration.
- Enforce fair and competitive salary scale.
- Develop employment policy.
- Enhance internal communication and networking.
- Establish internal monitoring systems for staff presence or performance.

Expected results will include, among others, the following:

- Adequate manpower and expertise ensured for effective environmental management.
- Brain drain to outside country halted by government based on fair salary scale and good governance.

Strengthening Law Enforcement:

Output 2.4: Strengthening law enforcement through updating and harmonization of environmental laws.

Actions:

- Establish an effective coordination mechanism for revival, integration and enforcement of environmental laws.
- Gaps assessment of environmental laws.
- Update and harmonize laws.
- Institutionalize the promotion of community-based model in the management of natural resources nationwide.
- Enact local council law No. 4 by creating effective local management structures of natural resources.

Expected results will include, among others, the following:

- Legislation inadequacies and gaps reduced by passing new laws and by-laws where needed.
- Environmental laws adequately harmonized and enforced as a result of enactment of law enforcement mechanism and supports societal and organizations.

EIA Enforcement:

Output 2.5: Strengthening enforcement capacity of EIA.

Actions:

- Subject overall development projects, programmes to EIA.
- Establish and enact by-laws penalizing EIA violation.
- Create branches for (EPA) in major agro ecological zones.
- Build the capacity of EIA unit of EPA on EIA development and enforcement.
- Involve business community in EIA applications.

Expected results will include, among others, the following:

- Adequate infrastructure and human resources granted for EPA for EIA enforcement.
- Reduced pressures on environmental resources as results of enforcement of EIA regulations.

RESEARCH AND TECHNOLOGY DEVELOPMENT:

Strategic objective 3: Streamlining research effort to improve understanding of the natural resources capacity to deliver goods and services and support livelihoods of Yemeni people sustainably.

Stimulation of Integrated Researches:

Output 3.1: Stimulate integrated research on natural resource.

Actions:

- Experts committee for coordinating integrated research.
- Initiate researches on, rare and endangered species and their habitats.
- Undertake stock assessment studies for the living marine resources.
- Research to quantify and forecast the response of genotypes, species, habitats, ecosystems and landscapes under anticipated climate change.
- Develop methodologies for adaptation and conservation policies.
- Assessment on needs to adapt and mitigate climates change.
- Assessment needs for mitigating impacts of earth quake, land slides and industrial accidents.
- Develop flora, fauna, and marine inventories.
- Provide funds and infrastructure for research institutions to develop research programs in the target areas.
- Conduct forest, range, soil and desertification surveys.
- Support traditional and environmentally sound land use practices.

Expected results will include, among others, the following:

- Research outputs widely disseminated and used in planning and management of natural resources.
- Better knowledge and understanding of available environmental resources and their capacity to provide goods and services.

Strengthening Environmental Monitoring and Disaster Preparedness:

Output 3.2: Promoting the transfer and application of science and technology in the management of natural resources, and monitoring of causes and consequences of man-hazards and natural disasters on natural resources.

Actions:

- Promote satellite based for monitoring natural resources, including monitoring extreme weather events such as and drought cyclones, and floods rains... etc.
- Establish information systems, including networks, application and expansion of GIS systems.
- Develop adequate networks for observation and monitoring of environmental variation.
- Revive and apply traditional knowledge, innovation and good practices in environmental management.
- Promote research on renewable and alternative energy.
- Capacity building on weather monitoring and predictions of extreme weather events.
- Capacity building on biodiversity assessment, climate molding, GIS, networking, and newly introduced technologies and monitoring equipments.

Expected results will include, among others, the following:

- Reduced level of human and animal death as a result of introduction of early warning system.

- Smooth flow of environmental information between institutions.
- Well-equipped research centers to deal with natural disaster risks.
- Better understanding and knowledge on causes and impact of natural disasters.

Data and Information Collection, Dissemination and Monitoring:

Output 3.3: Strengthening information base and free flow environmental information.

Actions:

- Establish environmental communication units in relevant environmental agencies.
- Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information.
- Train staff of media and communication units on data acquisition, processing and production and dissemination of awareness materials.

Expected results will include, among others, the following:

- Free flow of information between environmental agencies.
- The MEAs focal points and research centers fully equipped with up to date ICT and data management technologies.
- Information gaps and uncertainty reduced.

PUBLIC AWARENESS AND EDUCATION:

Strategic objective 4: Rising environmental awareness of Yemeni society by integrating environmental themes in university and school curricula, promoting green media, and launching nationwide public awareness campaigns.

Rising Environmental Awareness and Education of Yemeni Society:

Output 4.1: Raising environmental awareness through a nationwide public campaigns, and national programmes for integrating environment themes into national educational curricula at all education levels.

Actions:

- Prepare national awareness strategy on values, importance and maintenance of major environmental assets.
- Promote environmental public awareness campaign through TV and radio mass media, community workshops, fact sheets and brochures production, electronic information and other communication materials.
- Expand establishment of green media and NGOs to act as advocacy groups for the protection of nature and the environment.
- Promote and facilitate community awareness and involvement in protection of environment.
- Assess capacity needs for incorporating environmental themes into schools and universities curricula.
- Develop Programmes for integrating environment themes into educational curricula at all education levels.
- Integrate green themes into the education curricula of schools and universities
- Develop training programs for teachers, to enable them developing and teaching environment themes.
- Establishment of youth green clubs in schools in all governorates.

Expected results will include, among others, the following:

- Environment themes adequately integrated into educational curricula at university and school levels.
- Constructive change of student and teachers attitudes towards environmental issues.
- Environmental advocacy groups among youth created to support the environmental issues.

CONSERVATION AND SUSTAINABLE USE OF NATURAL RESOURCES:

Strategic objective 5: Promote the conservation and sustainable use of natural resources.

Sustainable Land Use:

Output 5.1: Promoting sustainable land use management plans and practices.

Actions:

- Mobilize resources for updating and implementation of the NAPCD.
- Monitoring desertification processes through mapping of sand dunes; surveying and mapping of decertified lands.
- Promote public participation in land management.
- Harmonization of GDFCD mandates and role.
- Development of meteorological and hydrological networks, and improvement of the climatologically data base; research and assessment of climate aspects of desertification, including droughts.
- Establishment of early warning systems for drought preparedness, and for combating desertification.
- Revival and application of traditional systems terraces and rangelands conservation and in water sheds.
- Mobilizing resources for demonstration and application of appropriate methods for reducing wind and rainfall erosion, stabilize dunes, surface-water harvesting and ground-water; assessment, development and management of ground-water resources in critically decertified areas.
- Prepare and implement rangelands management plans.
- Mobilizing resources for initiation and management of pilot projects for integrated village development and grazing-lands rehabilitation.
- Promoting the use of natural fertilizers in replacement of imported agrochemicals.
- Promoting the integrated pest management techniques.
- Implementation of long-term Programmes, involving forestation, agro forestry, terraces rehabilitation, dune and wadi bank stabilization, shelters belts, greenbelts and windbreaks, and watershed management and protection (Ministry of Finance, Ministry of Planning).

Expected results will include, among others, the following:

- Reclamation of fragile ecosystems for productive use based on revival and application of good practices.
- Prevention of further desertification and land deterioration through forestation, agro forestry, and sand dune fixation Programmes.
- Improve country adaptation and preparedness for mitigating potential impacts of such drought and extreme weather events.

Conservation and Sustainable Use of Biological Resources:

Output 5.2: Strengthening ex-situ and in-situ conservation capacities.

Actions:

- Formulate national policies for the protection of flora, fauna and their habitats.
- Promotion of the conservation and development of protected areas through the formulation and implementation of community-based management plans.
- Prepare and implement recovery and rehabilitation plan for threatened plant and animal species.
- Formulation of relevant instruments to govern accessibility to crop plant genetic resources.
- Establishment and maintenance of data bases on plants, animals and protected areas.
- Assessment of the status and trends of wildlife and habitat conservation.
- Assessment and management of *ex situ* crop and fodder plant genetic resources.
- Mapping and prioritization of threatened endemic species and habitat.
- Development of guidelines for collection, maintenance and reintroduction of plants and animal species in ex-situ programmes.
- Research and surveys on endangered flora and fauna.
- Development and strengthening capacity for *ex-situ* conservation through the establishment of gene banks, seed banks, national herbarium, natural history museum and public gardens.
- Use of a combination of in situ and ex situ conservation to maintain species and genetic resources.

Expected results will include, among others, the following:

- Endangered species protected through number of ex-situ and in-situ conservation measures.
- Well-equipped institutions to recover and rehabilitate threatened flora and fauna.
- Adequate and reliable information base generated for the sound planning and management of biological resources.

Biosafety:

Output 5.3: Strengthening institutional capacity of the National Committee for Biotechnology and Biosafety.

Actions:

- Prepare and apply national policy for bio-technology and Biosafety.
- Assess options for the safe transfers and use biotechnologies.
- Establish data base for Biotechnology and Biosafety and activate information exchange programme.
- Control and manage the side effects of using the genetically modified organisms.
- Strengthen the capacity of organizations in the field of Biotechnology and Biosafety through establishing specialized laboratories and train the local staff.

Expected Results:

- National Biosafety Framework developed.
- Survey of existing biotechnologies and status of safety in biotechnology application completed.

CLIMATE CHANGE AND ENERGY USE:

Strategic objective 6: To mitigate the adverse impacts of GHG emissions.

Output 6.1: Strengthening mitigation and adaptations capacity.

Actions:

- Enhance the capacity of the joint mechanism of the CDM, to enable it to fulfill its role.
- Enhancement of the newly established CCU to continuously handle climate change issues, whether on the national, regional or international level.
- Develop and implement national mitigation plan for energy sector.
- Promote adoption of clean technologies by industry, in particular in the small and medium sector, through regulatory and fiscal measures, and standards setting.
- Implement the National Adaptation Programme of Action (NAPA).
- Enhance information base through creating and maintaining a national climate change web page with links to national, regional and international sources of information.
- Create a database on clean technologies, and promote dissemination of new technologies developed both in Yemen and abroad.
- Promote climate change and technology research.
- Increase awareness of decision makers and encourage/support research community.
- Provide training to new GHG inventory experts and university students for each GHG inventory category.
- Building capacity in developing and appraising clean technology switchover and project proposals.

Expected results will include, among others, the following:

- Rational energy use and reduction of CO₂ emissions as a result of promotion of clean technologies, and the enforcement of norms in energy related sectors.
- Energy production scheme of lower pollution and cost promoted due to introduction of renewable energy.
- Higher population access to electricity ensured in rural poor areas as a result of shift to renewable energies.

1 INTRODUCTION

The Action Plan for Environmental Capacity Development resulted from National Capacity Self-Assessment that identified, through country-driven consultative process, priorities for capacity development to enhance national efforts for global environmental management. The Action Plan should be viewed together with the thematic assessment for biodiversity conservation, climate change and land degradation (**included in the Annex 2**). It describes the current situation regarding both global and national environmental management in Yemen, including the country's strength, constraints and capacity needs.

The Action Plan is organized as follows:

- Chapter 1 introduces NCSA.
- Chapter 2 outlines strategic objectives of the Action Plan, and scope of NCSA action plan.
- Chapter 3 summarizes expected results and proposed actions, proposes potential implementation arrangements and establishes the linkages with other relevant initiatives, processes and reforms currently underway in Yemen or planned in the context of country development and sustainable environmental management.

Annex 1 presents the detailed and complete Action Plan in a matrix format, organized around six core objectives, key activities, indicators of success, indicative timeframes and approximate costs of action, leading and collaborative agencies.

1.1 National Capacity Self-Assessment (NCSA)

The NCSA is an assessment and planning exercise financially supported by the GEF through two of its implementing agencies the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP), but driven by country participants¹. Over 150 developing countries have embarked on this process and Yemen has been part of this important endeavor.

The primary goal of NCSA is to determine national priorities for capacity development to better address global environmental issues. The NCSA analyses the country's capacity strengths, constraints and needs, and recommends capacity development actions to address them.

The focus is on a country's capacity requirements to implement the three "Rio Conventions" – biodiversity (CBD), land degradation (CCD), and climate change (UNFCCC) – and other relevant Multilateral Environmental Agreements (MEAs). In addition, the NCSA process aims to identify cross-cutting capacity issues and foster synergies among the MEAs.

¹ In Yemen, the country received the GEF funding and implementation support through UNDP



The country-driven approach of the NCSA enables countries to integrate their plans for capacity development in improved environmental management with broader national sustainable development goals and programmes. This integration will help to secure follow-up to the NCSA, and ensure that the NCSA leads to measurable improvements in environmental management at both global and national scales.

The main concepts and guiding principles are at the core of NCSA implementation and have been closely followed by the NCSA in Yemen and served as the main conceptual framework for the NCSA assessment.

Capacity development: the process by which individuals, organizations, institutions and societies develop abilities [individually and collectively] to perform functions, solve problems and set and achieve objectives (UNDP, 2002).

There are three levels of capacity that are strongly interconnected and at which capacity development efforts should take place:

- At the *individual* level, capacity development refers to the process of changing attitudes and behaviors, most frequently through imparting knowledge and developing skills through training. However it also involves learning by doing, participation, ownership, and processes associated with increasing performance through changes in management, motivation, morale, and levels of accountability and responsibility.
- Capacity development at the *institutional* level focuses on overall performance and functioning capabilities, such as developing mandates, tools, guidelines and information management systems for the ability of the organization to adapt to change. It aims to develop its constituent individuals and groups, as well as its relationship to the outside.
- At the *systemic* level capacity building is concerned with the creation of “enabling environments”, i.e. the overall policy, economic, regulatory, and accountability frameworks within which institutions and individuals operate. Relationships and processes between institutions, both formal and informal, as well as their mandates, are important.

The following are the main functions of capacity that occur at all three levels:

Capacity development dimensions and functions:

1. Capacity to conceptualize and formulate policies, legislations, strategies, and programmes.

This category includes analyzing global conditions that may affect country needs and performance in a given area, developing a vision, long-term strategizing, and setting of objectives. It also includes conceptualizing broader sectoral and cross-sectoral policy, legislative and regulatory frameworks, including synergies between global environmental conventions. It further contains prioritization, planning and formulation of programmes and projects.

2. Capacity to implement policies, legislations, strategies, and programmes.

This category includes process management capacities that are essential in the implementation of any type of policy, legislation, strategy and programme. It also includes execution aspects of programme and project implementation. It includes mobilizing and managing human, material and financial resources, and selection of technologies and procurement of equipment.

3. Capacity to engage and build consensus among all stakeholders.

This category includes issues such as mobilization and motivation of stakeholders, creation of partnerships, awareness-raising and developing an enabling environment for civil society and the private sector, stakeholder identification and involvement, managing of large group process and discussion, including mediation of divergent interests, as well as the establishment of collaborative mechanisms.

4. Capacity to mobilize information and knowledge.

This category pertains to the mobilization, access and use of information and knowledge. It includes issues such as effectively gathering, analyzing and synthesizing information, identifying problems and potential solutions, as well as consulting experts and peers. It further covers specific technical skills that are related specifically to the requirements of the sub programs and associated Conventions, including the capacity to carry out scientific and technical assessments in the areas relevant to GEF focal areas and related Conventions.

5. Capacity to monitor, evaluate, report and learn.

This category pertains to the monitoring of progress, measuring of results, codification of lessons, learning and feedback, and ensuring accountability to ultimate beneficiaries and partners. It also covers aspects such as reporting to donors and global conventions. It naturally links back to policy dialogue, planning and improved management of implementation.

The following seven **guiding principles** of NCSA is part of the GEF's operational guidance to the NCSA implementation:

- Ensuring national ownership and leadership, and the use of national or regional experts.
- Using existing coordinating structures and mechanisms.
- Paying due attention to provisions and decisions of the three Conventions, as they relate to capacity building.
- Ensuring multi-stakeholder participation, consultation and decision making, through appropriate institutional arrangements.
- Building on ongoing/existing work relevant to NCSAs, for instance through GEF-supported enabling activities, and national reports related to the Conventions.
- Adopting a holistic approach to capacity building that addresses capacity needs at the systemic, institutional and individual levels while integrating such capacity building into wider sustainable development efforts.
- Adopting a long-term approach to capacity building within the broader context of sustainable development.

2 NCSA PROCESS AND METHODOLOGY IN YEMEN

As recommended by the NCSA resource kit, the NCSA process of Yemen was implemented in four phases devoted for:

- 2.1 Inception phase,
- 2.2 Thematic situation analyses and capacity needs identification,
- 2.3 Identification of synergies among the MEAs, and cross cutting issues,
- 2.4 The NCSA action plan process.

2.1 Inception Phase

This phase was initiated by the appointing the National Project Coordinator (NPC) on date 24th of September 2005 According to the project document, NPC was responsible for mobilizing project inputs and achieving project outputs. The overall project implementation and endorsement of its outputs were under the responsibility of the Environment Protection Authority (EPA) and the UNDP were responsible of project activities implementation in corporation with the Ministry of Planning and International Cooperation (MPIC), Ministry of Agriculture and Irrigation (MAI), Ministry of Fish Wealth (MFW), National Water Resources Authority (NWRA), The Ministry of Water and Environment (MWE), the Public Electrical Corporation of the Ministry of Electricity, the United Nations Development Programme (UNDP), and Non-Governmental Organization (NGO).

Having completed the formation of the NCSA management structures, the Project management was provided with an office, within the EPA main office in Sana'a, to be used for NCSA management and coordination activities during the project lifetime which was started on 24th of September 2005 and ended up on 31st of December 2007. To make this office operational, it was further equipped with computers, printers, photocopy machine and office furniture needed for the functioning of coordination units, the national consultants worked for the NCSA process. Pursuant to the Project document and the Management structure of the NCSA process, the national consultants who were selected for project implementation reported directly to the NPC, who in turn, reported to the EPA chairman, the executing agency of the project.

Following his appointment as National Project Coordinator Mr. Gamal Al Harrani guided by Mr. Mahmoud Shidiwah, the EPA chairman and the UNDP economic growth team leader, preceded with implementation of project activities planned for this phase. Recalling that NCSA planning has been early completed during the formulation of NCSA Project, the activities planned for this phase were mainly dedicated to clarify the projects' scope, its implementation strategy, and NCSA work plan to the stakeholders concerned with MEAs implementation.

2.2 Thematic Assessment Phase

The goal of the Yemen NCSA is to determine the priority needs and establish a plan of action for developing Yemen's capacity to meet its commitments for national and global environmental management. The NCSA was a highly participatory and consultative process that produced number of technical reports with a primary focus on capacity needs assessments in the three main areas: biodiversity conservation, climate change and desertification, land degradation, particularly in the context of MEA compliance and implementation of the National Environmental and Action Plan (NEAP) as a policy document highly linked to the said thematic areas. This Action Plan for Environmental Capacity Development is the final product of the NCSA and is based on three earlier assessment reports **(included in the Annex 2)**.

This phase completed through establishment of three thematic core groups to systematically undertake situational analyses and capacity needs assessment with regard to implementation of the UNFCCC, the CCD and the CBD conventions. Each thematic team was composed of a team leader assisted by 3-4 national consultants specialized in the respective thematic areas **(See list of experts in Annex 7)**.

Before initiating the thematic assessment, thematic core groups submitted an inception report, highlighting a methodology for conducting the thematic assessment, to the EPA chairman and other stakeholders and approval of proposed methodology. Having approved the methodology, each team then proceeded with the thematic assessment in two sub-phases, the first of which was dedicated for thematic assessment on the status of implementation of the MEAs conventions, while the second for the assessment of capacity needs to fully comply with Yemen's obligations as stated by the three conventions. The situation analysis was completed by each team through literature review and analysis of legal frameworks, national environmental strategies and plans. Based on such reviews, each thematic group prepared an initial un-prioritized long list of capacity gaps in the respective thematic area. These gaps were later presented to stakeholders in three consultation workshops with aim to create consensus among stakeholders regarding gaps/constrains. In every workshop held for every thematic area BD, CD and CCD, the stakeholders formed four specialized groups to analysis the gaps/constrains using problem tree analysis and develop logic frame, outlining the cause-effect relationship for each capacity constraint identified by national experts.

By finalizing these logic frameworks the stakeholders then held another meeting dedicated for prioritization of such capacity issues and redevelopment of the logic framework in reprioritized formats. In order to proceed with prioritization process, the participants of the workshop split into three specialized groups, and each group was guided by the relevant core experts group of the thematic area convene several discussion meetings with aim to prioritize capacity issues based on the following benchmarks:

- Irreversibility: An environmental issue/problem would rank highest, in terms of priority of attention to it and taking action, if it has reached a stage at which it can never be corrected in the short term if no action is taken.

- Geographical Extent: The geographical extent affected by the environmental issue/problem whether *national, sub-national or localized* would determine the priority of actions to mitigate the problem.
- Urgency: It denotes the urgency needed to address a given environmental issue/problem which needs *immediate action* because of the magnitude of its adverse impacts if no action is taken.
- Relevancy to the national development priorities and Poverty Eradication Action Plan.
- Health Impacts: The third priority would be given to an environmental issue/problem that would have adverse impacts on human health if it is left to continue with no correction made. The larger the number of individuals affected, the higher is the priority for taking action to minimize the effects. The severity of an environmental problem affecting a portion of the population (such as babies, kids, females, males, old people) may make it of a high priority.
- Issue of cross-sectoral impacts/benefits - if the issues impacting more than one sector.

The results derived by each discussion groups, were then presented to the plenary meeting of the workshop, which approved the newly prioritized capacity issues.

Once the situation analysis has been completed, the core a group of national experts were called to review the findings of capacity actions on the three thematic areas for considering by stakeholders. The appointed teams through questionnaires, interviews, field visits, and roundtable discussions prepared long lists of capacity needs for implementation of the three MEAs; and also proposed the following criteria for selecting the prioritized experts' lists of capacity actions:

- Effectiveness: the degree to which the system achieves its objectives.
- Efficiency: the degree to which it generates its products using a minimum of inputs.
- Relevance: the degree to which the system's objectives and activities reflect the necessities and priorities of key stakeholders.
- Financial sustainability: the conditions to make a system financially viable.

The national stockholders agreed to apply the priority criteria recommended by national experts and based on which they reproduced the initial capacity actions in new lists containing the most priority capacity building needs for the three thematic areas.

Based on these findings, the team leaders of each thematic area drafted the thematic assessment reports outlining the key capacity constraints and the priority actions for developing Yemen's capacity to meet its commitments for national and global environmental management. All thematic reports disseminated to stakeholders concerned with MEAs implementation and based on their feedbacks the drafts were amended incorporate the stakeholders inputs into the reports.

2.3 Identification of Synergies among the MEAs

To develop cross-cutting report, the NPC - Mr. Gamal Al Harrani - appointed one of the team leaders to review the thematic assessments reports and to formulate a report, outlining existing synergetic areas among the priority capacity issues identified during the earlier NCSA consultation process. The report identified crosscutting issues as well as conventions specific issues, constraints and interventions for implementation of the three conventions. It also identified the opportunities for integration of the synergistic capacity building interventions into the existing policies and plans. The report was discussed by national experts and stockholders at a workshop held in Sana'a. The participants of the workshop, through same agreed-upon prioritization criteria used in earlier prioritization process, re-prioritized the synergistic capacity building issues, constraints and interventions (**Annex 3**).

Based on the overall findings of the workshops, cross-cutting report amended. The same meeting also identified the strategic objectives for reversing current capacity issues towards fully meeting country commitment stated by the three conventions.

2.4 Action Planning Phase

Having identified the strategic objectives for reversing current environmental situations, the Project designated a national consultant to prepare an action plan addressing a number of priority issues in addition to priority conventions specific issues. The selected consultant through the review of synergetic report formulated the first draft of the action plan, containing key outputs, actions, indicators, and budget estimates, and inputs to implement the corresponding outputs (**Annex 1**).

The draft NCSA action plan was then disseminated to around 100 national experts who were also called to attend a workshop to discuss and approve it on behalf of their agencies. The workshop held and during which the participants after being divided into three working groups evaluated the proposed actions and corresponding outputs and recommended to the plenary meeting of the workshop to approve it. Based on the review of working groups and the comments of the feedbacks of the plenary meeting, the action plan were then amended by the consultant and approved in later consultation meeting.

3 GLOBAL ENVIRONMENTAL MANAGEMENT IN YEMEN

3.1 Country Context

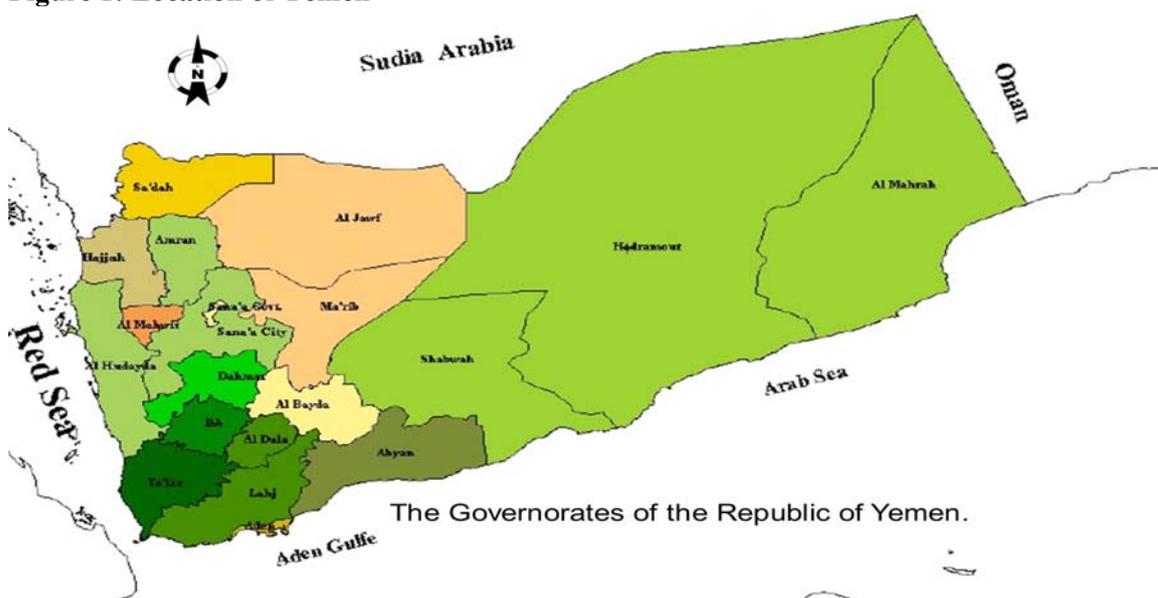
3.1.1 Geographic Location and Land Area

Yemen is an arid Middle Eastern country, occupying an area of 527,970 square kilometers at the south western tip of the Arabian Peninsula. It is bordered to the north by Saudi Arabia and to the East by Oman. It has a 2,250-kilometer coastline along the Gulf of Aden and the Red Sea. Yemen is characterized by five major ecological systems:

1. Hot-humid Coastal Plain,
2. Temperate Highlands,
3. Yemen High Plateaus and Hadramout–Mahra Uplands,
4. The Desert Interior, and
5. The Islands Archipelago.

This geographic diversity demonstrates the global significance of most of Yemen's ecological zones, which though fragile and confined to small areas, human communities, flora and fauna are highly adapted to subsist within them. Other ecological zones are much larger, and are supporting the majority of the country's agricultural production. In both cases, climate change poses a major threat. Changing climatic conditions, resulting in changes in the distribution and productivity of Yemen's natural resources – in particular, its surface water, but also its soils, grasslands, mangroves, and forests – will have significant repercussions for scores of its people.

Figure 1: Location of Yemen



3.1.2 Climate

Climate of Yemen is characterized by five major land systems:

1. Hot and humid coastal plain,
2. The temperate Yemen Highlands,
3. The Yemen High Plateaus and Hadramout – Mahra Uplands,
4. The desert interior, and
5. The islands.

Reflecting this geographic variation, rainfall varies widely, from less than 50 mm along the coast, rising with the topography to between 500 and 800 mm in the Western Highlands, and dropping again to below 50 mm in the desert interior.

Rainfall and temperature are the most important factors for life. Because moisture from rainfall is the minimum factor it 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.

Rainfalls primarily in spring and summer, and is determined by two main mechanisms: the Red Sea Convergence and the Inter Tropical Convergence Zone. Temperature depends primarily on elevation, and in the coastal areas, is determined by distance from the sea. Mean annual temperatures range from less than 12°C in the Highlands (with occasional freezing) to 30°C in the coastal plains. Yemen lies within the northern stretches of the tropical climatic zone and its border with the sub-tropical climatic zone. The extreme differences in elevation are largely responsible for the great variations in temperature and climate over the country. Mean annual temperatures range from less than 15°C in the highlands to 30°C in the coastal plains.

3.1.3 Population

In the last three decades, Yemen has witnessed rapid population growth, reflected in the population increase from an estimated 12.8 million in 1990 to 14.5 million in 1994, and to 19.7 million in 2004. Moreover, the population is characterized by a young age structure, where 45% of the population is below 15 years of age as per 2004 population census. The natural population growth has declined from 3.7 to 3.00 percent per annum between 1994 and 2004, respectively. The population density is 43.2 persons per sq. km.² Though Total Fertility Rates (TFR) has declined from 7.4 in 1994 to 6.1 per woman in 2004 which is still high and this is attributed to widespread of illiteracy between females, and modest participation of females in the labor power.

3.1.4 Gender Policies

Yemen's constitution declares equal rights and obligation for men and women, and makes discrimination on the basis of sex illegal; the government capacity to enforce such laws is weak, mostly due to inadequacy of the administrative apparatus. New laws introduced since Yemeni unification provide women more security rights, yet without effective enforcement, these are virtually ineffectual.

In 1997, the government adopted the Yemeni Women's National Strategy. Among the institutions established to work on women's issues is the women National Committee. Its duties include cooperating with local, regional and international organizations involved in women's projects, conducting studies relating to women, contributing to women's legal awareness, and holding workshops and conferences. Its effectiveness is hampered, however, by lack of adequate funding; absence of coordination at a national level, unavailability of data disaggregated by gender, and ambiguity of its goals.

3.1.5 Education

Illiteracy also persists, where an estimated 49.4 per cent of the populations are illiterate; and explains high rates of unemployment and poverty, as well as degraded human resources.

In 1990, illiteracy was estimated at 64% and basic education enrollment was at a low 59.6% (especially female 37.6%). The unified state of Yemen has paid special attention to meet the education and training needs. Over the period 1990-2000 public expenditure on education has attained an average of 18% of total public expenditure, which assisted in making considerable progress in expanding educational capacities of schools, institutes and universities. Nonetheless, basic education enrollment has lost six percentage points in total enrollment during that period, to the benefit of secondary and university education, whilst vocational training and technical education share remained unchanged.

Illiteracy, low enrollment and school drop out take precedence over other challenges that impede socioeconomic development and its sustainability. The present situation is far from satisfactory, as the illiteracy rate remains high at around 55.7% of the population aged 15 years and above (36% males and 74.1% females). Facing these challenges, the Government has launched a national strategy for literacy and non formal adult education. However, the limited financial resources allocated for those programs and lacks of community participation have led to achieving partial results. Only 290 thousand illiterate persons have become literate during the First Five-Year Plan (FFYP).

3.1.6 National Economic Features

The economy grew by an average of 8.3 per cent per year during 1995-97. Output growth declined in 1999 to 3.7 percent. High oil prices in 2000, however, improved all macroeconomic indicators (oil accounts for 70 per cent of government revenues and 87 per cent of goods and services exports). Gross Domestic Product (GDP) growth recovered to 5.1 per cent in 2000, the budget noted a record surplus of 8 per cent of GDP, and the current account of the balance of payments has gone from a deficit of 4.3 percent of the GDP in 1998 to a record surplus of 24.2 per cent in 2000.²

3.1.7 Land Resources and Land Use

Despite the continuous declining share in GDP, agriculture remains the most important sector employing 54% of Yemen labor force, and contributed around 21% in the total GDP. Yemen current total cultivable area is about 16,700 km², of

² World Bank, Yemen, Country Brief Series, www.worldbank.org

which 72% uncultivated utilizing rain-fed, flood, and ground water irrigations schemes. Rangelands together with forest and woodlands comprise 34% of total area. This land is grazed by 8 million sheep, 7.9 million goats and 1.5 million cattle (Statistical Yearbook CSO 2005). Other land, mostly desert with limited use potential constitutes about 49% of the total area. This area also includes roads and residential areas. The deterioration of soil resources poses a genuine environmental threat, due to high salinity of soil and desertification, which threatens approximately 97% of the land throughout the country and destroys 3-5% of arable land every year.

The fisheries sector witnessed high growth during the FFYP, averaging at 12.3% against a planned target of only 7%. In view of its potential, the sector's performance remains modest as its contribution to GDP has not exceeded 2.4% and its exports have not surpassed YR 4 billion in 2000. The Sector has been suffering from many difficulties and obstacles; most prominent are limited infrastructure and basic services provided to fishing activities, lack of accurate and reliable statistical database, weak sector management and policies, and an incomplete legislative and regulatory framework. Moreover, the fish wealth and marine resources are exposed to over-exploitation and illegal fishing, in addition to inadequate quality control systems and measures.

Perceiving the relative priority given to the Sector by Yemen's Strategic Vision 2025, and its potential in contributing to alleviate poverty and unemployment, the SFYP targets achieving an average growth of 13% in fish production, which will increase final year's production to 248 thousand tons. The value of output will also increase at an average 11.8% per annum, while fish exports are expected to achieve an average growth of 11.5% per annum reaching a total of 38 thousand tons in 2005.

3.1.8 Biodiversity

Quick environmental deterioration has resulted in a clear recession of the wild plant cover, thus causing a threat to wild life and biodiversity in general. This situation has recently pushed the Government to declare some forest areas wild life reserves to protect rare Species. The Yemen Government has signed several international agreements, set to safeguard biodiversity, such as the international agreement for protecting biodiversity, the agreement on preventing desertification and the agreement on the protection of threatened plants and animal species: Annual forests areas depletion rate during the period 1990 to 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 plant cover is being over depleted. Depletion exceeds tree planting by far thus creating a serious environmental situation. Threats to coastal environment are multitudes. They include: construction expansion on coastal cities, demolition, of coasts, sanitation, and ships waste.

3.1.9 Water Resources

In Yemen, average annual per capita share of water resources is 137 m³, vis-à-vis 1250 m³ in Middle Eastern and North Africa countries group and 7500 m³ as world average. Since mid 1970s, with the introduction of pumping technology, Yemen

has witnessed great expansion of groundwater pumping. Extraction of ground water has exceeded the level of replenishment capacity causing water depletion. Many regions in the country are threatened by serious depletion of water resources. Also, while water policies and conservation measures are virtually absent, several institutions, with overlapping and conflicting mandates attempt to draw strategies that ensure proper management of water resources and implement the water sector policies. Implementation failures are partially attributed to the absence of a system of supervision and maintenance. Also, diesel subsidy has encouraged the over-extraction of groundwater.

Recent studies indicated that water resources imbalance reached a deficit of 900 million m³ in 2000. The crisis is manifested by pointing out that over 90% of water consumption is used for irrigation, and a great portion of that reflects irrigation efficiency below 40%. Water needs are estimated at 3,521 million m³ in 2010, with a decline of irrigation share to 2,869 million m³ as a result of improved irrigation efficiency to 75%. Household share and other uses are expected to increase to 563 million m³ and 89 million m³, respectively, implying the widening of the gap to 921 million m³ annually. Underground water in the various basins reaches 20,000 million m³. Obviously, a deficit of about 700 million m³ in 1995, expected to increase to 921 million m³ in 2010 would result in the depletion of 12,157 million m³ of ground water by 2010. However, the growing gap does not imply proportional and regular impact among the various regions and water basins. Over-extraction reaches between 250-400% in some regions such as Taiz, Sa'dah, Sana'a and Abyan.

3.1.10 Energy

The availability of energy e.g. electricity plays an important role in development and economic growth. The percentage of electrification of Yemen is estimated to be 29% of the total population in 2000³. 40% of the urban and 26% of the rural population has access to either central or decentralised provided electricity. The country faces a shortage in satisfying the increasing demand of electricity due to aging and inefficient electrical power stations, distribution networks, and rising lost estimated at 38% in 2000, bypassing known international standards. The shortage of energy is regarded as one of the main investment obstacle in the country, without mentioning other institutional, technical and administrative problems.

The Government plans to use natural gas to generate electricity which is regarded as a suitable alternative source to generate power, and started to promote renewable energy e.g. solar and wind, to increase the electrification rate to 40%. To achieve these targets major measures need to be adopted, such as the development of a coherent strategy, the cut of diesel subsidies, technology transfer and the mobilization of further resources.

³ Ministry of Planning and Development, Second Five Year Plan (p209)

3.2 Key Commitments and Actions

Yemen ratified the UN Framework Convention of Climate Change in February 1996, the Convention to Combat Desertification in January 1997, and the Convention of Biological Diversity in June 1992. The Republic is also party to number of relevant UN conventions and regional protocols including, the Vienna Convention for Ozone Layer Protection, its Montreal Protocol and the London and Copenhagen Amendments, the Basel Convention on Trans-boundary Movement of Hazardous waste, (UNDRR), the RAMSAR Convention for the conservation of wetlands, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention to combat Persistent Organic Pollutions (POPs), World Heritage Convention, Washington Convention, and Bonn Convention for migratory species.

3.2.1 The Poverty Reduction Strategy Paper (PRSP) 2003 – 2005

The PRSP aims to reinforce sustainable management of natural resources, mobilize beneficiaries, involve the poor and support the role of women and youth in environmental conservation through number of measures, including:

1. Enhancing technical capacities of relevant institutions to develop comprehensive environment and development programmes based on community participation;
2. Improving and enacting legal frameworks, and empowering local organizations;
3. Enhancement of environmental awareness;
4. Financial support to environmental projects by providing soft loans thus generating job opportunities;
5. Reinforcement of water resources institutions; Environmental assessment; and
6. Environmental impact assessment.

3.2.2 Vision 2025

Evaluating the First five year development plan, the government came to a conclusion that the goals of sustainable development can never be reached through a short-term vision. A new approach was needed to concentrate on long-term vision and solutions since most of Yemen's development challenges require continuous action over a long period of time. Such long-term vision should however be flexible and liable to revision and correction through short to medium-term plans. As a result, the government developed vision 2025, which included the following environmental interventions and measures:

1. Developing and implementing sustainable management and monitoring programmes for water and land resources, agriculture, coastal zone, biodiversity and waste management.
2. Developing desertification control programme.
3. Providing energy substitutes.
4. Adopting environment-friendly technologies and enhancing renewable energy resources.
5. Enhancement of environmental awareness activities aiming to induce behavioral changes.

3.2.3 The Millennium Development Goals

The main objectives are:

1. Eradicate extreme poverty and hunger.
2. Achieve universal primary education.
3. Promote gender equality and empower women.
4. Reduce child mortality.
5. Improve maternal health.
6. Combat HIV/AIDS, malaria and other diseases.
7. Ensure environmental sustainability.
8. Develop a global partnership for development.

3.2.4 National Environmental Plans

The Government of Yemen through support from the international community, has produced a range of national policy, plans, and Programmes addressing environmental problems, of which the following are most important:

- The National Environment Protection Action Plan in 1996 (NEAP I) and its update of 2006 (NEAP II).
- The National Strategy for Environmental Sustainability (NSES) 2006.
- The National Biodiversity Strategy and Action Plan (NBSAP), 1999.
- National Action Plan to Combat Desertification (NAPCD), 2000.
- Yemen First National Communication, 1996.
- Environment Status Reports (ESR), 2005 and its update of 2006.

In 1996, the Government of Yemen published its first National Environmental Action Plan (NEAP). The NEAP I promote sustained use of natural resources through a set of legislative, institutional, economic and financial measures, improved information base, and through community involvement. The main environmental problems stated by NEAP I are: Water depletion, pollution and supply, land degradation, Habitat degradation and, waste management.

This first NEAP formed the basis for the environmental chapters in the Five Year Development Plan for the period 1996-2000, and for international technical assistance over same period and the subsequent five years. Over this period the Government in cooperation with international donors has made remarkable efforts in implementing NEAP activities and the most important results of these joint efforts are the following:

- Formulation of Eco-tourism strategy.
- Identification of fifteen protected areas.
- Declaration of five nature reserves as protected areas.
- Formulation and implementation of five management Plans (for Socotra islands, Aden wetlands and Jbal Bura'a conservation zones).
- Formulation and implementation of three coastal zone Management Plans for Aden, Balhaf, and Jathmon-Sherma.
- Enactment of management bodies for four protected areas.
- Establishment of ecotourism department.
- Conducting flora and Fauna surveys, and socio-economic studies for Socotra islands, Aden wetlands, Jabal Bura'a, Balhaf, and Jathmon-Sherma and Hawf conservation zones.
- Studies on Yemen flora and fauna, coastal habitat, agro-biodiversity, socio-economic, and traditional practices.

- Surveys of marine habitats and resources of the Red sea.
- Establishment of GIS system for the red sea coastal area.
- The biodiversity conservation zoning plan for Socotra archipelago.
- Master plan for Development of Socotra Archipelago protected area,
- Formulation and implementation of three management plans for conservation of Socotra, Hawf and Bura'a nature reserves.
- Establishment databank and genetic resources unit in AREA.
- Desertification and land degradation maps.
- Watershed database and maps.
- Implementation of several programmes on desertification, sand dune stabilization and the regeneration of watersheds... etc.

In 2007, NEAP implementation was assessed and based on that the government developed NEAP II which deals with emerging priority environmental issues such as: water depletion, pollution and supply, over extraction of ground water, lack of water allocation and conservation systems, water pollution, inadequate water supply services, land degradation, soil erosion, deforestation, agricultural and rangeland deterioration, loss of farm land due to urban encroachment, habitat degradation, degradation of natural habitats (forests, wetlands, coastal habitats), loss of biodiversity (extinction of endemic, rare and endangered species), lack of management of ecotourism, waste management, solid waste management, hazardous waste management, and pesticide management.

The National Strategy for Environmental Sustainability (NSES) 2006

The National Strategy for Environmental Sustainability (NSES) was completed in 2006 through UNDP's Sustainable Natural Resource Management Programme (SNRMP). The NSES examined the environmental problems in terms of impacting causes, Pressures and Driving Forces and hence suggests strategic framework and action plan for environmental Sustainability. The NSES calls undertaking a numbers of short and medium term interventions to address the following critical environmental issues:

1. Water.
2. Land resources.
3. Biological diversity.
4. Coastal and marine environment.
5. Waste management.

The NSES attempts to link the effect of environmental degradation on poverty, and seek to investigate means to achieve the Millennium Development Goals (MDGs).

The National Biodiversity Strategy

Another important policy document is the first National Biodiversity Strategy and Action Plan (NBSAP) which was formulated in 1998. The NBSAP sets priority activities in six programmes, setting timelines and identifying responsible parties. It covers a range of actions, including capacity building for biodiversity conservation.

National Action Plan to Combat Desertification

In its effort to address Yemen commitment stated in the United Nations Convention to Combat Desertification and Drought (UNCCD), the Government developed the National Action Plan to Combat Desertification (NAPCD) in Year 2000. The plan was prepared following a consultative process outlining the direct and indirect causes of desertification; its physical and socio-economic aspects, anti-desertification policies, and the strategic framework and action plan to mitigate drought effects. The NAPCD also provides a preliminary picture of the national capacity building needs and constraints for land degradation management.

The First National Communication

With the GEF/Netherlands financial/technical assistance (1997-2001), the GOY completed important enabling activities for climate change including, the First National Communication (FNC), the GHG inventory, mitigation analysis, policy frameworks for the reduction of GHG emissions and the enhancement of forest sinks. Moreover, a top-up activity for climate change has been undertaken and aimed at developing a project proposal on renewable energy.

Development Plans

In 1996, the government launched the First Five Years Plan (FFYP) for the period 1996 to 2001. The overall objective was to generate and distribute economic and social development opportunities among governorates⁴ in order to reduce the current wide disparities. Also provisions were made for the protection of natural resources (especially water) in order to sustain economic growth and development with a fair distribution of benefits.

After the First Five Years Plan, the government developed the Second Five Year Plan (SFYP) (2001-2005). The main thrust of both plans is to increase per capita income in Yemen by overcoming the almost complete reliance on the oil and gas sector and by diversifying GDP generation sources.

The Second Five Years Development Plan, which was launched in 2001, also addresses sustainable development priorities and sets as an objective “to preserve the nation’s natural resources and maintenance of the ecological system through a balance between socio-economic growth and available resources”. The plan proposes a number of measures and actions including institutional restructuring, strengthening of natural resources planning and management capacities, establishment and operation of environmental monitoring systems, upgrading of legal frames and information bases, resource mobilization and supporting the participation of relevant agencies, target groups and local communities.

Recently, the government is executing the *third Quinquennial Plan -2006-2010-* whose focus devoted mainly for *good governance, particularly the following areas:*

- Develop the Judiciary System and Support Its Independence.
- Strengthen Security and Stability.
- Develop Legislative Structures.
- Modernize the Civil Service and State Administration.

⁴ An administrative division of a country

- Upgrade the Capacity of Audit and Control.
- Combat Corruption.
- Support Human Rights.
- Support Democracy Implementation and Political Partnership.

3.2.5 Environmental Programmes

Environmental and Sustainable Development Investment Program 2003–2008

The plan presents an outline strategy and priority interventions aimed at controlling and gradually reversing environmental impacts. Six main areas of interventions were identified in the plan. The total proposed investment budget is estimated to be US \$ 30.2 million. The six main areas of interventions are:

1. Habitat and biodiversity conservation.
2. Sustainable land management.
3. Sustainable water resources management.
4. Sustainable waste management.
5. Sustainable climate change and energy management.
6. Institutional development/capacity building.

Within each program area, the plan proposes priority actions and budget for each action. The total proposed investment budget is estimated to be US \$ 30.2 million.

The list depicted in the plan does not reflect priority areas for interventions, but emphasizes areas where some funding was available under ongoing projects.

Pasts and Ongoing Project Addressing MEAs Conventions

In its attempts to address desertification issues, the Government has been very active in combating land degradation and acceded to the United Nations Convention to Combat Desertification (UNCCD) on January 1997. Further, it has implemented a number of projects which dealt with combating desertification and mitigating the effects of drought. This includes, among other, the following:

1. Land and Water Conservation Project (1995- 1999),
2. The World Bank, Forestry Development,
3. Environment Resource Assessment for Rural Land Use Planning (Switzerland- 1994-1999),
4. Tehama Environment Protection Project (IFAD 1996-2003),
5. Wadi Hadhramout Agricultural Development (WP 1990-1997),
6. Sustainable environmental management, (1997-2003-UNDP/GEF/The Netherlands).

The main results derived from above-mentioned interventions include, among other, the following:

- Establish a national land resource data base suitable for physical planning of agricultural development.
- Land resource utilization studies and plans for watersheds in Abyan and Shabwa.
- Developing and guidelines and manuals for land resource utilization planning and land degradation monitoring.
- Soil survey, classification and mapping for Shabwah and Abyan Governorates.

- Comprehensive study on underlying causes of desertification in Yemen.
- Developing desertification and land degradation maps for critical areas.
- Developing forest policy and law.
- Revival of traditional grazing reserves pilot areas.
- Rehabilitation and development of dam reservoirs.

As for biodiversity area, the Government, over the past 15 years, has secured donors' funding for executing a number of oriented biodiversity activities/programmes, including the following:

1. National Biodiversity Strategy and Action Plan (YEM/96/G31- 1997 – 2004),
2. (YEM/97/G31), Conservation and Sustainable Use of the Biodiversity of Socotra Archipelago,
3. Protection of the Marine Ecosystems of the Red Sea Coast Yemen, YEM/97/G32, 1997 – 2004,
4. (YEM/97/G32) RAB: Strategy Action Plan for the Red Sea and Gulf of Aden,
5. UN-Nexen Water Resources Management,
6. Natural Resources Management Programme (2004 – 2007),
7. Sustainable Development and Biodiversity Conservation for the People of Socotra Islands (YEM/03/004- 2003 –2008),
8. National Programme for Integrated Water Resources Management, (YEM/03/013, 2003- 2003).

The main results derived from above-mentioned joint donors/government efforts include, among other, the following:

- Eco-tourism strategy prepared.
- Fifteen protected areas have been identified for purposes of conserving biodiversity, and these include forest reserves and national parks.
- Of which, five areas regions announced as protected areas (these are: Socotra islands, Aden wetlands, Jbal Bura'a, Otuma, and Hawf conservation zones).
- Three management Plans (for Socotra islands, Aden wetlands and Jbal Bura'a conservation zones) formulated and implemented.
- Protected area Management plans for Hawf formulated and partly executed.
- Two coastal zone Management Plans for Balhaf, and Jathmon-Sherma formulated and approved.
- Management bodies for four protected areas formed and functioning.
- Ecotourism department established.
- Flora and Fauna surveys in addition to socio-economic studies for Socotra islands, Aden wetlands, Jabal Bura'a, Balhaf, and Jathmon-Sherma and Hawf conservation zones completed.
- Studies on Yemen flora and fauna, coastal habitat, agro-biodiversity, socio-economic, traditional practices.
- Surveys of marine habitats and resources of the Red sea completed.
- GIS system for the red sea coastal area established.
- Genetic resources databank established in AREA research center.

In climate change area, Yemen has been conducting a number of enabling project on Climate Change, which includes:

1. National Adaptation Programme of Action (YEM/03/G37-2003 – 2004),
2. The Netherlands Climate Change Assistance Program,
3. The Socotra Conservation project.

Through the projects Yemen identified priorities and capacity building needs with respect to Climate and GHG emissions. Yemen submitted its first national communication to the COP-UNFCCC in October 2001, and a top up was approved by GEF-Sec expedited financing to enable the GOY to assess its capacity building constraints and needs in climate change and to develop its second national communication. (See list of projects in Annex 4).

3.2.6 Legal Frameworks Supporting MEAs Implementation and Environmental Management

Over the last 15 years, Government has put in place the Environment Protection Law (EPL) in addition to a number of environment related legislations addressing sustainable natural resource management. These laws contribute to the achievement of national sustainable development and poverty alleviation goals, and also provide the basis for implementation of RIO conventions. The EPL of 1996 and its update of 2007 embodied the main principles of Rio Declaration, 1992 on sustainable development. Among others, the EPL is based on the principles calling for environment protection, maintenance of balance in the ecosystem and rational utilization of the natural resources for the benefit of the present generation without affecting the ability of the future generation to utilize these resources. Other main environment and environment related legislation produced by Yemeni government are provided in Annex 6.

3.2.7 Institutional Framework

The law gives the responsibility of environment protection to EPA and number of line environmental Agencies, emphasizes the incorporation of environmental consideration at all planning levels and the undertaking of environmental impact assessment for developmental projects. These include:

1. The Ministry of the Water and Environment (MWE) was established by the Government in 2003. The Ministry is responsible for Water Resources Management and serves as the focal point for environmental management. The Ministry's Mission is to address environmental issues and ensure the sustainable use of Yemen's natural resources by monitoring the implementation of Government policy pertaining to environmental protection and conservation of the natural resources. Specifically, the Ministry is responsible for initiating and implementing policies' pertaining to environmental protection, pollution control, conservation and sustainable exploitation of natural resources.
2. The Environment Protection Authority (EPA) is a body "to do all such things which are necessary to protect, the environment, control pollution and to ensure the health and welfare of persons, animals and the environment in general". The primary function of EPA is to advise the Government through the Minister of the Water and Environment, on formulation of policies relating to good management of natural resources and environment on one

hand and development of appropriate environmental legislation on the other. Specifically, the EPA is responsible among other things for:

- 2.1. Conducting studies and making recommendations on pollution control standards and for their enforcement.
- 2.2. Coordinating the activities of all Ministries and other bodies concerned with protection of the environment.
- 2.3. Obtaining information and data on management of natural resources anywhere in Yemen.
3. The Ministry of Planning and International Cooperation (MPIC) is responsible for planning and coordination of all development activities and for resource mobilization. MPIC works in conjunction with the Ministry of Finance. MPIC mobilizes external aid in form of grants and provides the main link between the macro and micro-economic frame works by ensuring that planned investment programs of the Government are in line with stated national objectives. In addition coordinates the preparation of the Public Investment Program and monitors its implementation in line with stated goals for sustainable human development.
4. The Ministry of Agriculture and Irrigation is responsible for food security, land and soil conservation, land use planning and Irrigation, water management and Water Resources Management in conjunction with the MWE.
5. Ministry of Public Works and Highway is responsible for human settlements, road constructions and urban and semi-urban development.
6. The Ministry of Tourism is responsible for Wildlife Management and development of the tourist infrastructure.
7. The Ministry of Oil and Minerals is responsible for the oil and gas and mining sectors.
8. Other Government institutions with responsibilities in the environment sector include:
 - 8.1. The Civil Aviation and Meteorology Authority (CAMA) for climate monitoring.
 - 8.2. The Agricultural Research and Extension Authority (AREA) for Scientific Research.
 - 8.3. Renewable Natural Resources Research Center (RNRRC) for natural resources studies and research.
 - 8.4. National Water Resources Authority for water management.
 - 8.5. National Water and Sanitation Authority have responsibility for the urban sector.
 - 8.6. The General Authority of Rural Water Projects and certain municipalities have responsibility for the rural sector.
 - 8.7. General Department of Forestry and Combating Desertification (GDFCD).
9. Non-Governmental Organizations (both local and international) also play an important role in the management of natural resources and in environmental protection and are expected to participate in the various activities of the sub-programs.

3.2.8 Environment Status Reports (ESR) 2005

The reports on the Status of Environment in 1995, 2000, and 2005 give general description of the environmental situation in the country and provide broad qualitative assessment on trends associated with natural resources. This is mainly due to the inadequacy/lack of quantitative data on parameters concerning the quality of the environmental resources. At the national level, there is no environmental monitoring of air quality, water quality, wastewater quality and other environmental resources. Furthermore, there is no proper resource management of important economic resources such as fisheries.

3.2.9 Civil Service Reform

Under the Civil Service Modernization Project (CSMP) funded by World Bank (WB), and the Support for administrative reform funded by the EU, the government is currently reviewing mandate, roles and responsibilities of seven government agencies with aim to enhance policy and institutional performance of the selected agencies. The initiative is expected to restructure the selected agencies through adoption number of reengineering strategies addressing human resources, information technology internal business process issues. The Ministry of Civil Service (MCS) through the support of the CSMP has recently established a computerized systems full entity verification of government personnel based on bio-print and unique facial contours.

In 1998, the government adopted the Civil Service Modernization Strategy aiming at restructuring public administration and developing a modern administration apparatus. In addition the strategy aims to promote the involvement of private sector and Civil Society Organizations (CSOs) in the socio economic development initiatives. Since the early 1990s, there has been an increase in the number of Civil Society Organizations (CSOs) concerned with environmental issues, comparing to one organization prior to 1990. Preoccupations and concerns of these organizations have covered a multitude of areas, including chemical and radiological pollution, preserving bio-diversity and preventive health... etc.

The CSO's activity in the area of environment protection was reflected at three levels:

1. Organizations and societies active in the field of environment protection in general. There were 31 societies by the year 2000.
2. Organizations specializing in a specific aspect of environment protection, such as the pollution prevention societies, including among others the palm-trees protection societies, horses and water protection societies.
3. Local development societies, which dedicate part of its activities to environment protection activities, including the development of water resources, palm-tree planting, water and stream harvesting, combating desertification developing range land, and preventing over-cutting of trees, protecting fisheries and implementing sanitation projects, cattle breeding, developing bee-hives and conservation of heritage... etc.⁵

⁵ Source: Human Development Report - Yemen 2000\01

4 KEY CAPACITY GAPS AND CONSTRAINTS

4.1 Unsustainable Use and Management of Natural Resources

4.1.1 Desertification

Thematic Issues

Land resources of Yemen face the threat of desertification with its various symptom, including sand dune encroachment, water resources depletion, degradation of terraces and rangelands, overgrazing, deforestation, wind and water erosion, and salinity, which, in turn, result from excessive human and animal pressure and poor management of farms and pastures.

Desertification is closely related to severe droughts, which result from climate fluctuations but are themselves aggravated by desertification. Watershed ecosystems are rapidly changing through accelerating soil erosion, landslides, deterioration of range resources, and loss of biological diversity. Their ability to support water resources development, regulate runoff, maintain down-stream resources and structure, and support the livelihood of their inhabitants is becoming increasingly limited. Erosion of the highland terrace systems has negative consequences on the overall watershed management. Crop and irrigation patterns exacerbate water scarcity and result in salinity of aquifers. In addition, deforestation and desertification through wood cutting and overgrazing are becoming real threats to sustainable human development. Moreover, considerable agricultural land is lost due to desertification and dune encroachment, particularly along the coastal areas. Degradation of the coastal environment threatens the country's fishery wealth, which if appropriately conserved could constitute a valuable assets. Over cultivation to meet rapidly growing needs for food, combined with insufficient attention to the environmental effects of agricultural and pastoral practices, have increased the rate of desertification.

Desertification Capacity Issues

Desertification impact is accelerating in many parts of Yemen due to outdated National Action Plan for Desertification Control (NAPDC) combined with the lack of policies and programmes, as well as the human and financial resources, to execute such policies effectively. This situation is often aggravated by weak public and community support and involvement in desertification control and management. The lack of regulating policies and the low level of public awareness of environmental problems increase the rate of deterioration of land resources and agriculture productivity. This status is further complicated by the lack of strong institutional mechanisms at local government level to put in place and enforce by-laws and ordinances on sustainable land management. In addition, more agricultural land is lost due to soil loss and decrease in soil fertility under current inadequate agricultural practices, including the excessive application of chemicals, fertilizers and pesticides, and inappropriate land tenure combined with recession of traditional systems on land use.

4.1.2 Biodiversity Loss

Thematic Issues

Under current accelerating growth of economy, Yemen's biological resources are fast deteriorating as a result of numerous environmental problems, including deforestation; pervasive and coral reef destruction; massive pesticide poisonings; degradation and erosion of agricultural lands; pollutants intrusion into aquifers; irresponsible tourism activities; marsh and mangrove destruction; loss of forest and green cover associated with massive urbanization; industrial pollution; continual reliance on non-renewable energy sources; destructive fishing methods; and indiscriminate oil exploration. Furthermore, the unplanned use and conversion of land has resulted in agricultural land degradation, and even loss, of certain natural habitats, as well as causing large-scale pollution.

In recent years, agricultural practice in the Republic of Yemen has been characterized by a significant increase in the use of mechanization, fertilizers and pesticides; bad soil fertility management; poor plant nutrition; and overgrazing. These inappropriate practices impact directly on the quality of land resources limiting the options for other land use needs. The continued application of chemicals would likely result in some change of the soil structure. The results of increasing amounts of fertilizers led to losses of soil nutrients. One of the long-term consequences of this is desertification. As the soil becomes less fertile, and costs rise in using the area, it may often be abandoned. Coastal and Marine Habitat Degradation is in general the result of over fishing, the use of ground dragnets in fishing or the use of explosives, unplanned coastal reclamation, expanded physical destruction, liquid and solid waste pollution from sewage, industrial plants and ports facilities, oil pollution from passing ships, over-cutting of mangroves for wood and use of mangroves for feeding camels, agro-chemicals flushed by floods and from the waste of electric power generating stations.

Biodiversity Capacity Issues

The limited knowledge, the lack of effective system for sharing of biodiversity information databases, the retardation of indigenous knowledge and skills, lack of facilities, inadequate expertise in species identification, and poor means of monitoring trends in biodiversity resources are the major constraints affecting biodiversity conservation of Yemen.

Effective management of natural habitats is hampered by; ineffective regulatory and economic policies; limited information base; limited public awareness on biological resources at the individual, communal, and national levels. Ineffective management related to the conservation of biodiversity in Yemen is attributed to: lack of adequate legislation to protect flora and fauna. The effective management, monitoring and evaluation of the Yemen's biological resources is further constrained by inadequate political will to streamline public support and community participation in biodiversity conservation. In addition, existing institutional setup is not appropriate in mobilizing adequate resources for biodiversity conservation. Shortcoming in this area is attributed to limited personnel in conservation issues, lack of coordination between ministries, and lack of enforcement capacity.

Another issue is related to low level of public awareness of environmental regarding the protection of biodiversity. The lack of regulating policies and the low level of public awareness of environmental problems are increasing the rate of deterioration of natural resources and agriculture biodiversity of the country. Therefore, immediate actions are needed to safeguard the remaining natural resources and to prevent genetic deterioration. These include: apply traditional agriculture knowledge in the management and use of natural resources, preservation of plant genetic resources by establishing genetic banks and botanical gardens, adopt integrated pest management, raising public awareness on implication of the natural resources degradation, national environmental policies/strategies, and law enforcement.

Finally, the local communities have not yet been developed to the level of meeting their commitment because of limited capacity to mobilize and access government and donors funding required for active involvement in the country conservation initiatives. More importantly, the dynamics of consultation and mode of learning, that is required to keep these local individuals and communities engaged in process of protecting their resources, have not yet been stimulated.

Biotechnology and biosafety are relatively new issues in Yemen for which there is poor understanding and knowledge on the nature and extent of the risks of the transfer of biotechnology and the use of Living Modified Organisms (LMOs) on human being and environment. Furthermore, there is no specific entity responsible for handling the safe use and transfer of biotechnology and LMOs. These deficiencies, combined with unavailability of policy and legislation framework for regulating biotechnology and biosafety issues, are likely to cause high level of risk on the country fragile ecosystems and its endemic species. Therefore in order to foster this situation and halt any further biodiversity destruction, there is a need to develop a national biosafety framework.

4.1.3 Weak Capacity to Mitigate and Adapt to Climate Change Issues

Thematic Issues

Yemen CO₂ emission for 1998 was 14158 Gg of CO₂-equivalent, which represents only 0.1 per cent of global CO₂ production with most of which comes from liquid fuels use, and the transportation sector is the largest producer. Regardless the very low level of GHG emissions, the current patterns of energy use and consumption pollute and degrade the environment resources and threatens the stability of natural resources.

While Yemen is not a major contributor to GHG emissions, its natural systems and economy is anticipated to suffer from projected climate change. The nature and magnitude of the potential risks as addressed by Yemen's vulnerability and impact studies are widespread particularly on ecosystems, agricultural potential, water resources, coastal and marine resources.

Yemen vulnerability studies show that potential wheat yield is predicted to decrease in rain-fed farming systems as a result of change in spatial and temporal precipitation patterns. In addition to the decline of crops there will be a decline in crops quality in different climatic zones combined with change in cropping patterns and change in land use. Crop productivity is likely to be affected by



salinity in the southern and western coasts. Simulation studies also shows that rainfall level may decrease over much of Yemen territories, the timing of rainfall, the intensity of individual storms, and the onset of rainfall seasons may all change. The annual decrease and shift in rainfall distribution when combined with changes in potential evaporation rate would result in a new water regime for Yemen which would impact water supply, demand and water use for agriculture industry and households. Agriculture sector would face deficit of water supply as result of drying of Wadies Delta which in turn would lead to abandonment of agriculture in the many delta.

Simulation studies shows that climate change threats on biodiversity will be aggravated, causing mores stress on critical habitats such as mangrove, sea grass, and other important marine and coastal resources. One of the potential climate thereat concluded by Yemen's vulnerability study is triggering water erosion which would result in the coastal plains increase of Wadi beds sedimentation, destruction of woody vegetation, increasing bank erosion, widening of Wadi beds and loss of arable land closed to Wadi banks. This feature coupled with elevated sea level rise would lead to coastal infrastructure damage, destruction of critical habitats, increased saline water of coastal aquifers, the decline of mangroves, the deterioration of marine water quality and the bleaching of marine reefs. Coastal zone erosion along the red sea and the Gulf of Aden may be further affect agriculture, mangrove, range and fisheries.

Recognizing climate change threats, the government of Yemen ratified the United Nations framework convention and immediately initiated implementation process to meet the commitments of the Convention in cooperation with international community. Since the ratification of the convent, Yemen has been engaged through the cooperation with international community in implementing several climate change activities with special focusing on: policy development and planning, climate research and monitoring, human and institutional capacity building; capacity-building of national focal points; development of national communications and GHG inventories; vulnerability and adaptation assessment; planning of adaptation programs; assessment of mitigation options; research and systematic observation, education and public awareness; and establishment of databases.

Climate Change Capacity Issues

Although of incredible progress made by Government in environmental policy system, climate change is not of top priority for the country, and the country capacity in terms of human, administrative, finance and technical resources for implementing this commitment is insufficient.

The state's general system of Yemen is not adequately mainstreamed towards climate change issues and so the largest segment of the society has modest role or no role in the planning and management process of climate change issues. As a result community and private sectors are seldom mobilized for implementing climate changes projects and the burden of projects' funding rest on donning communities.

Also the weak recognition of the climate change issue relative to other development issues at different levels of decision making and this undermines their ability to mainstream related climate issues into general planning and strategy formulation.

The NCSA analysis identifies a number of capacity constraints that hinders the country capability in meeting its commitment as stated by the UNFCCC convention. Of these constraints are: absence of an institutional structure aimed at integrating climate change issues into national plans., extensive use of high carbon content fuels, weak enforcement of existing standards for air-pollution control, lack of national mitigation and adaptation plans for climate change, limited public awareness on climate change, biodiversity issues, and friendly technologies, lack of human resources to address climate issues, weak recognition of the climate change issue relative to other development priorities.

The republic of Yemen, as most of the developing countries, has its own pressing development problems that determine its national priorities. At present, climate change is not one of those priorities. National planners and policy makers have never taken the threat of climate change into account; neither their planning tools nor practices are suitable for this. Due to lack of sufficient capacity the national institutional arrangement is not yet well prepared to deal with climate change issues.

Clean technologies are promising option to minimize the generation of energy waste in generation and consumption phases. Based on this fact the plan calls for Promoting the adoption of clean technologies by energy providers, including industry, particularly in the small and medium sector, through regulatory and fiscal measures, and standards setting.

Barriers to the adoption of clean technologies are: First, the fact that many of them are highly protected by strong patent regimes internationally. Second, there is inadequate funding for switching existing production facilities to clean technologies. Third, there is lack if not absent capacity in Research and Development (R&D) with regard to developing viable clean technologies locally.

4.2 Crosscutting Capacity Issues

Perverse production and consumption practices are the immediate causes of environmental degradation, but an exclusive focus on these aspects alone is insufficient to prevent environmental harm. The causes of degradation of environmental resources lie ultimately in a broad range of policy, and institutional, including regulatory shortcomings, leading to the direct causes. However, the range of policies, and legal and institutional regimes, which impact the proximate factors, is extremely wide, comprising fiscal and pricing regimes, and sectoral and cross-sectoral policies, laws, and institutions. Accordingly, apart from programmatic approaches, review and reform of these regimes to account for their environmental consequences is essential. In addition, there is lack of awareness of the causes and effects of environmental degradation, and how they may be

prevented, among both specialized practitioners of the relevant professions, including policymakers, as well as the general public, which needs to be redressed.

4.2.1 Weak Planning Capacity of Natural Resources

Yemen policy setup within which sectoral plans and Programs are developed is neither adequately responsive to mobilize reliable information for policy development, nor is effective to mobilize optimal government and societal resources for delivery of environmental policy. Under current policy set-up, MEA concerns are not fully integrated into the national/district development planning, and the livelihoods of local community are not fairly addressed in environmental policies. Furthermore, policy development responsibilities are fragmented among several highly centralized agencies and there is no vital role for the private sector, local community, and NGOs in planning and implementation of environmental policies. The coordination of national and international agencies involved with environmental protection programmes is weak, environmental monitoring is feeble and overlapping, and public awareness are not well developed and enforcement procedures of existing policies are not clear.

Finally, the capacity of MEAs focal points to develop strategies action plans is weak and their capacity for execution of such policies is constrained by weak national capacity to mobilize resources from national/international sources, limited expertise on UN Conventions, and weak Scientific and Technical Cooperation as well as exchange of information on environmental issues.

4.2.2 Inadequate Funding for Delivery of Environmental Policies

In Yemen environmental issues are not considered among most pressing concerns compared with social issues such as poverty, health and education. Consequently, government funding for environmental issues is inadequate for meeting Yemen commitment as stated by MEAs conventions. This funding inadequacy is further aggravated by weak focal points capacities to mobilize resources from international agencies associated with low level awareness of national staff on MEAs conventions, their funding mechanism and funding eligibilities. These challenges are compounded by a weak information base for policy development, poor expertise in project and strategy formulation, lack of networking, and weak scientific and technical cooperation with international agencies.

4.2.3 Inadequate Institutional and Legislative Frameworks

The institutional setup within which environmental policy is evolved and executed in Yemen faces a number of difficulties. The major problem is inflated, distorted public administration, which is the root cause of the multiplicity of implementing organizations that require coordination to achieve effective delivery of environmental policy. The current over-centralized nature of the public administration system has marginalized regional and local authorities and lead to weakening of their capacity to plan and implement environmental policies and development projects/programmes.

The loose and decentralized working relationship between concerned agencies has resulted in a weak coordination, integration, and harmonization of overall efforts devoted for halting natural resources degradation. The limited financial and information resources limit the abilities of organizations and institutions to

collaborate. Furthermore, there are number of root causes which influence the performance of national agencies responsible for environmental management. These include: insufficiency of qualified specialized manpower; unclear and duplicated mandates of environmental agencies, absence or incomplete organizational structure and job descriptions, and lack of appraising system for evaluating staff performance associated with absence of by-laws and internal operation system.

The Republic of Yemen, over the past fifteen years, has enacted large number of laws and by-laws conducive to environment. However, most of the existing national legislations in the Republic of Yemen have evolved in an ad-hoc, fragmented and uncoordinated manner, leading to overlapping jurisdictions, and weak enforcement of the said laws. Furthermore, some legislation which is currently in place is either outdated or inadequately addressing environmental concerns, particularly MEAs issues. On top of above constraints, many laws lack complementary by-laws, guidelines and standards for their effective enactment. Inadequacies in legislative framework of national institutions have weakened the institutional performance in managing of natural resources leading to accelerate environmental degradation.

4.2.4 Weak EIA Enforcement

Though the Environment Protection Law No. 26 of 1995 (EPL) and its draft update of 2007 both confirmed the application of the Environment Impact Assessment (EIA) in the development projects, the EIA is not widely applied in these, thereby causing many threats to the country limited natural resources. Weak enforcement of environmental impact assessment is attributed to the limited managerial and technical capacity of the human resources available to EPA and other agencies concerned with EIA enforcement. This situation is further constrained by the very limited physical infrastructure and facilities as well as the lack of EIA by-laws, procedures, clearer criteria, and responsibilities for EIA application and enforcement.

4.2.5 Ineffective Manpower to Handle Emerging Environmental Issues

Manpower performance of Yemen's public administration is constrained by limited human resources, uncompetitive salary scales, unfavorable terms and conditions of public service in addition to inexistence of fair criteria and benchmarks for staff appraisal and promotions. These constraints coupled with lack of employment policy causes high level of brain drain. This situation is further triggered by improper internal system for communication and management of information combined with ineffective internal monitoring systems for staff presence or performance and improper system for delegation of authority.

Yemen also experiences a shortage of specialists in several environmental related disciplines such as, taxonomy, marine biology, entomology, land-use planning, project development and planning, climate modeling, development of climate scenarios, projection of GHG emissions, assessment of sectoral climate impacts, data management, and application of remote sensing techniques. This situation is aggravated by lack or shortage of funds and resources to conduct proper training on a regular and systematic basis. The NCSA thematic assessment reveals that no systematic framework exists for training and continued development of technical

skills in all institutions involved in natural resources management including: EPA, GDFCD, AREA, NWRA, Ministry of Water and Environment, Ministry of Agriculture and Irrigation and many others. Therefore there is a real need to develop comprehensive training plans for the four agencies and to ensure their financing.

Training courses provided by of local universities are not market-oriented and thus not responding, in term of research, studies and graduates, to local needs with regard to desertification, biodiversity and climate change issues. Environmental agencies and local universities in Yemen should address these concerns and work together to re-adjusting education and research in the universities to meet local requirements. In this context, it is need to assess capacity need of universities for introducing desertification, biodiversity and climate change courses into Sana'a, Aden and Hadramout universities.

4.2.6 Limited Environmental Research

Research on climate change, biodiversity and desertification issues is still poor or nonexistent. This is partly due to inadequate financial resources, infrastructure and facilities for research institutions, and partly to the lack of trained human resources.

Financial constraints is the most limiting factor, which hinder research institution capacity to deliver concrete scientific knowledge to improve policy makers and public understanding of environmental issues, thereby causing low level of societal commitment towards these issues.

Because of financial constraint, research institutions have limited infrastructure and facilities for environmental and disaster monitoring and for research investigation. This status is further aggravated by poor environmental database, shortage of Information Technology (IT) equipment, trained personnel, and information networking. In addition, the Yemen capacity to adapt and transfer clean technology is constrained by high cost of friendly technology, the lack of financing mechanisms for introducing clean technologies; lack of incentives to support technology, poor investment of business community in this area, lack of research centers in energy and friendly technology, and lack of skills and experience to assess new technologies.

4.2.7 Weak Information Base

As for information constraints related to policy development and research, it is worth mentioning that Yemen has considerable difficulties in allocating funds for the acquisition of reliable and timely information base as a prerequisite for appropriate planning and implementation of sustainable development strategies and management of natural resources.

Generally, most of environmental agencies lack the reliable information system for developing sound and realistic policies. Specifically, policy development capacity, especially within MEAs focal points, is constrained by shortage of data base combined with lack of human resources to develop and maintain data bases in addition to the lack of monitoring mechanisms associated with the absence of monitoring indicators for effective understanding of environmental issues and

hence effective policy development. Information exchange between key environmental actors is still weak owing to lack of information networks, differences in database formats, lack of hardware, software and internet facilities in addition to lack of GIS systems in most of environmental agencies.

The available environmental data are often outdated or incomplete and the development of effective information management system, including the introduction of both networks and Geographical Information Systems (GIS) is proceeding slowly and in fragmented manner. While most sectors are lacking the indispensable effective information management system, their attempt has resulted in a proliferation of equipment difficult to maintain and to operate, due to lack of training opportunities and lack of expertise as well as funds, and more importantly due to lack of field data.

4.2.8 Low Public Awareness of Environmental Issues

There is a lack of qualitative and quantitative data on the status of natural resources in the country. Consequently, public awareness of environmental degradation, especially among decision-makers and relevant agencies is still very poor.

This is further complicated by the lack of awareness and communication strategy and action programmes. Furthermore, there is inadequate integration of environmental issues into formal education programs and curricular, which in turn limits public appreciation of such issues.

5 GOAL AND STRATEGIC OBJECTIVES

The goal of the Yemen NCSA is to determine the priority needs and establish a plan of action for developing Yemen's capacity to meet its commitments to national and global environmental management.

5.1 Strategic Objectives

In order to achieve this goal, five strategic objectives were identified by stakeholders to guide and govern the subsequent selection of the types and scope of actions and interventions for inclusion into the NCSA action plan. The strategic objectives are as follows:

- Strategic objective 1: Strengthening the performance of environmental policies through the promotion of participatory national and local planning of natural resources;
- Strategic objective 2: Rationalization of legislative and regulatory frameworks for effective environmental protection;
- Strategic objective 3: Streamlining research effort to improve understanding of the natural resources capacity to deliver goods and services and support livelihoods of Yemeni people sustainably;
- Strategic objective 4: Rising environmental awareness of Yemeni society by integrating environmental themes in university and school curricula, promoting green media, and launching nationwide public awareness campaigns;
- Strategic objective 5: Promote the conservation and sustainable use of natural resources;
- Strategic objective 6: To mitigate the adverse impacts of GHG emissions.

5.2 The Scope of the Action Plan

To achieve above objectives, the action plan were designed to contain a number of environmental interventions and measures categorized under two groups. The first deals with priority synergistic capacity building needs and these are clustered under the following capacity building areas:

1. Policy Development and planning;
 - Resource mobilization.
2. Institutional and legislative strengthening;
3. Research and technology development;
 - Data and information collection, dissemination and monitoring
4. Rising environmental awareness and education of Yemeni society.

The second group is to deals with convention-specific capacity needs and these are regrouped under the following areas:

1. Sustainable use of natural resources;
2. Sustainable climate change and energy management.

Under each intervention area, the plan proposes priority actions and estimated budget for each action **and this budget is reflected in action plan matrix with total amount of US\$ 11,160,000.**

6 FRAMEWORK OF ACTIONS, EXPECTED RESULTS, AND IMPLEMENTATION STRATEGIES

As contribution to the stated strategic objectives to achieve sustainable environmental capacity development in Yemen the following outputs have to be delivered:

6.1 Policy Development and Planning

Strategic objective 1: Strengthening the performance of environmental policies through the promotion of participatory national and local planning of natural resources:

6.1.1 Policy Integration

Output 1.1: Integration of environmental concerns in policies, plans, programmes, and projects for economic and social development:

Under current policy setup, Yemen environmental policies are weakly integrated and environmental concerns as well as the local community needs are inadequately addressed by the national development policies. To resolve this policy deficit the NCSA action plan identifies a number of interventions and measures, which are mainly oriented to enable national and local partners to integrate physical, socio-economic and environmental factors in the formulation of public policies and in the national and district development plans. To attain this goal, the plan calls for training of sufficient number of people on strategy development and planning, development and application of guidelines for promoting technical co-operation and information exchange and the incorporation of local community concerns and environmental objectives into the national and district development plans. Training will be increasingly based on a decentralized system of institutions functioning as a network. Communications skills and information gathering will be enhanced. The action plan is to facilitate co-operation with relevant organizations to create community-based management plans for rangeland, coastal zone, and protected areas management. To facilitate continuing improvement of policies, programmes and the functioning of governmental institutions, increase emphasis will be given to their review and evaluation.

To sum-up, this output is designed to contain a number priority measures and interventions, which addresses capacity deficit of environmental policies, including the following:

- Readjustment of Yemen policies to account for environmental issues at both districts and central levels. Specific focus will be given to: update of NEAP, development of National Strategy for Environmental Sustainability (NSES), and formulation enforcement of number of integrated forest and range lands management plans (EPA, GDFCD, and AREA).

- Review and update of watershed management plans and marine and coastal management plans (EPA, GDFCD, AREA, NWRA, MAI, MWE, MSRA, and MFW).
- Review and update of policies of land use and land tenure.
- Formulation and implementation of Yemen Adaptation Programme of Action on climate change (EPA, AREA, NWRA, MEE, MAI, MWE, MSRA, MFW, and CAMA).
- Development and the application guidelines for mainstreaming environmental issues in the national and district development plans, focus will be given to climatic issues in the land use planning (EPA, GDFCD and AREA).
- Formulation and the application of a national plan on control and use of alien invasive species.
- Formulation and the application of water use policy (NWRA).
- Formulation and the application action plan for rehabilitation of degraded natural habitats (EPA).
- Formulation and the application plan for revival of best traditional knowledge of herding practices and rotational use of ranges implemented (EPA, AREA and GDFCD).

These interventions **will ensure** the existence of harmonized policies in line with Yemen MDGs, national priorities and international requirement as spelled out by MEAs conventions. In addition, they will facilitate integration of environmental concerns into the national and district development planning.

The integration of environmental issues in the context of overall national economic policy will attract more many partners, including international financial institutions to allocate an increasing proportion of funds for implementation of interventions and measures identified for policy restructuring. This will ensure will improve the conditions of the environment and support sustainable development.

The interventions identified in action plan would be implemented by a number of institutions, including EPA, GDFCD, AREA, NWRA, MEE, MAI, MWE, MSRA, MFW, and CAMA. To ensure effective implementation of above interventions results gained from ongoing reforms initiatives such as the Civil Services Modernization Project (WB), EU project on support for administrative reform, and Health Reform Support Project (WB) will be built on. The project will also built on results of policy restructuring exercise completed under UNDP Programme on Sustainable Natural Resources Management (SNRMP).

The policy restructuring exercise proposed by NCSA action plan will ensure close linkages and synergies with on-going restructuring initiatives such as the Civil Services Modernization Project (WB), the EU project on support for administrative reform, the Health Reform Support Project (WB), and the Sustainable Natural Resources Management (UNDP). Synergies with such initiatives will be attained through identification and replication of best practices on policy restructuring produced under such Programmes. Among best results to synergize with is the National Strategy for Environmental Sustainability (NSES), the NEAP II and the investment Programme developed under UNDP funded Programme on Sustainable Natural Resources Management. These policy documents are highly oriented to response to national and international requirements, particularly with regard to



MEAs conventions. Therefore, much of the proposed policy actions of the NCSA action plan build on and not duplicating with the NSES and NEAP II, particularly with regards to actions dealing with biodiversity loss, land degradations, and climate change issues.

Consultants will be procured to review and update National environmental policies, including NEAP, NSES and other strategies. Policy, review existing legislation and institutional arrangements, and prepare management plans for the three thematic areas. EPA and GDFCD will work in close collaboration with other environmental partners, local councils, NGOs, private sector, CBOs and local communities.

6.1.2 Participatory Planning of Natural Resources

Output 1.2: Promotion of participatory national planning of natural resources:

Yemen environmental policies are generally developed under weak inter-institutional coordination, which cause conflict of interests and lead to weak enforcement of such policies. Conservation of the environment, however, requires the participation of multiple stakeholders, who may bring to bear their respective resources, competencies, and perspectives for full implementation of environmental policies. Recognizing this fact, the NCSA action plan calls for adoption of participatory approaches in planning natural resources at both governmental and public levels. At governmental level, the plan proposes creating and enacting number of inter-institutional coordination mechanisms to facilitate stakeholders' involvement in the planning of natural resources, including the integrating of cross-sectoral environmental policies. Publicly, the plan calls for widening public-community partnerships and local communities to cooperate in the management of a given environmental resource, each partner bringing agreed resources, assuming specified responsibilities, and with defined entitlements. Potential areas for cooperation includes, *inter alia*, co-management with private sector of energy sectors, and local community management of rangelands and forest land, marine, and water sectors. This later policy options is further elaborated under the next output.

To sum-up, this output is designed to contain a number priority measures and interventions, which facilitate cross-sectoral partnership in policy development, such as the following:

- Stimulating and expanding public-community partnerships in the planning and management of natural resources, especially in energy sector and management of rangelands, land and forest.
- Expand youth role in environmental protection through supporting environmental clubs.

The implementation of above interventions will facilitate nationwide societal partnership in planning and management of the natural resources. In other words, it will help mobilizing optimal resources from financial institutions; business community; academic and research institutions; the media; youth clubs; and community based organizations for effective formulation, implementation, and promotion of measures for environmental conservation. More importantly, the public-community partnerships, particularly with business and local community

will increase government- public trust, ownerships and good governance, in particular with regard to transparency, accountability, cost effectiveness, and efficiency of Natural resources.

The output will be implemented through a number of forums and workshops targeted for initiating dialogue and cooperation among central stakeholders and reaching consensus on memberships and representations to the inter-institutional coordination mechanisms to be created for policy development in related environmental sectors. According to the recommendations of these forums, four cross-sectoral mechanisms will be created to be responsible for cross-sectoral policy development in land, marine, water and energy sectors, including disaster management.

6.1.3 Community Involvement in Environmental Planning

Output 1.3: Strengthening local community involvement in planning the protection of environmental resources:

Exclusion of local community in planning natural resources and policy development generally results in ignorance of local people needs and marginalization of those communities who bear most of the cost of environment protections. This in turn leads to negative attitude towards environmental protection initiatives and hence to failure in attaining their objectives in environmental protection. Furthermore, the ignorance of local people needs while developing environmental policies further deprive poverty level among poor causing excessive pressure on natural resources. On the other hand, decentralized management has been proved to be ineffective as regards conservation and protection of environment, particularly when it ignores the concerns of local communities. To remedy this situation, the action plan focus on empowerment of local community involvement in planning and management of natural resources. Emphasis is given to enable national and local partners to integrate livelihoods of local people and environmental factors in the formulation of public policies and in development planning process at the district level. Priority will be given to promoting the inclusion of environmental considerations in development planning and management.

To sum-up, this output is designed to facilitate local community involvement in environmental management through a number of priority measures and interventions including the following:

- Promote community-based planning model over management of natural resources.
- Promote sustainable livelihood approaches in the management of natural resources including the establishment of nature reserves.

Implementation of the above interventions is **expected** to help government shifting to community-based planning model in replacement of the ongoing ineffective centralized one. This will be realized through creation and implementation of number of community-based management plans in protected areas, and rangeland and coastal zone management. The move towards community based planning will in turn ensure addressing the livelihood needs while establishment and protection of nature reserves, which is a prerequisite for sustainable use of natural resources.

The participation of local community, especially women, local poor farmers, in identifying needs will help creating policies and management plans that is community oriented and at same time responsive to environmental needs. The shift to community planning approach in environmental protection will help integrating community's infrastructure, facilities, knowledge and experience into these plans ensuring effective and efficient implementation of such plans.

The implementation of activities planned under this output will build on planning experiences learned by local communities of Socotra, Bura'a and Aden wetlands through the support of two UNDP funded Programmes, namely, the GEF/UNDP Conservation and Sustainable use of biodiversity of Socotra Archipelago project, and the Sustainable Natural Resources Management Programme. Both projects have gained a fundamental experience in the development of local plans and are being highly involved in supporting the sustainable livelihoods of local populations in the three areas.

As for implementation of the livelihoods oriented activities, the action plan will build on and synergize with similar activities planned under the PRSP which aims to reinforce sustainable management of natural resources, mobilize beneficiaries, involve the poor and support the role of women and youth in environmental conservation. Also the plan will build on UNDP's National Action Plan to combat desertification which has mobilized extensive community involvement and can be considered a key experience in Yemen local participation in global environmental issues.

6.1.4 Resource Mobilization

Output 1.4: Strengthening resource mobilization capacity of MEAs focal points through enhanced awareness, information base, and capacity building:

Yemen capacity to mobilize adequate resources for effective delivery of environmental policies is generally weak. The ability to access financial resources from international donor agencies is constrained by poor policy makers' knowledge on UN conventions, their funding mechanisms, and eligibility criteria for funding from these mechanisms. This situation is further hampered by a weak information base for policy development, poor expertise in project and strategy formulation, lack of networking, and weak scientific and technical cooperation with international agencies.

To sum-up, this output is designed to address resource mobilization inadequacy issues through a number of priority measures and interventions including the following:

- Raise awareness of public and policy makers on conventions and funding mechanism of MEAs conventions.
- Provide training on resource mobilization from various international donor sources.
- Provide training to improve negotiation skills of policy makers.
- Train Environmental staff on planning and Project formulations.
- Provide financial and technical support to community environmental action, including the livelihoods of local communities.

- Secure adequate funds from government and donors to implement community action plans and programmes.
- Establish national information center (NEIC) under EPA umbrella.
- Provide the NEIC and MEAs focal points with the required hardware and software facilities to establish networks for information sharing between line institutions and international agencies.
- Implement training programs to improve capacity of policy makers in developing environmental strategies and plans.
- Provide training to staff of EPA and GDCFDC in report writing and information gathering related to MEAs conventions.
- Establish remote sensing systems and database/GIS systems for application in natural resources research and planning.
- Prepare training programs for (NEIC) staff and the units located at the governorate level.

Building staff capacity on negotiation skills, project formulation and strategic planning will help articulating Yemen environmental policies in line with eligibility requirements for funding through GEF and other funding mechanisms, hence leading to increased funding of for implementation of MEAs issues. Similarly, the existence of reliable database systems will help environmental planners to develop sound environmental policies and strategies. Furthermore, the existence of more partnership forums will increase advocacy for MEA issues among private sector community, thereby leading to mobilization of private sector for implementation of MEAs.

To mobilize adequate resources for effective delivery of Yemen environmental policies, the action plan gives special attention to enhance awareness of policy makers on funding mechanism of MEAs conventions and to increase their skills in formulating project proposals that meet funding eligibility of the funding mechanism. Other major area is to increase resources mobilization by promoting partnerships with private and local community actors. Such measures be implemented through training on negotiation skills, development of guidelines for mainstreaming MEAs in both national and district development and budgeting frameworks, organizing partnership forum, increased advocacy for MEA issues and sensitization of the private sector on their role in implementation of MEAs.

6.2 Institutional and Legislative Strengthening

Strategic objective 2: Rationalization of legislative and regulatory frameworks for effective environmental protection:

6.2.1 Institutional Restructuring

Output 2.1: Streamlining internal structures of environmental agencies:

Yemen public administration suffer from inexistence of a staff evaluation system coupled with lack of job descriptions, and difficulty to apply fair criteria and benchmarks for staff appraisal and promotions. These constraints are triggered by uncompetitive salary scales causes high rate of brain drain. In addition there are no

proper delegations of authority, or any system for communication and management of information among the staff or any effective internal monitoring systems for staff presence or performance.

Fragmented and uncoordinated developments of institutional legal frameworks in addition to overlaps in mandates and of environmental agencies are key factors contributing to degradation of natural resources. Effective management of Yemen's natural resources requires the establishment and implementation of an institutional framework that is more responsive to national priority and international needs. For this purpose, the intent of the NCSA action plan is to restructure environmental agencies with aim to rationalize their roles and mandates towards being more efficient and effective in developing and executing environmental policies and programs.

To enable MEAs focal points to discharge their responsibilities as needed by MEAs conventions, the action plans calls for restructuring of the climate change unit to be inter-agencies committees chaired red by EPA. As for CBD and CCD the action plan give special attention to create two similar units within EPA and GDFCD to be responsible for communication and co-ordination of desertification and biodiversity activities.

To sum-up, the action plan is designed to harmonize institutional deficit through the following priority measures and interventions:

- Review and harmonize mandates of relevant agencies (EPA, Meteorological department of CAMA, GDFCD).
- Review and amend organization structure job description relevant agencies (EPA and GDFCD).
- Prepare by-laws/internal operation system.

It **is anticipated** that the implementation of the above interventions will lead to clarification of role and responsibilities of environmental agencies through creation and update of harmonized and consistent mandates, organization structures, job descriptions, by-laws/internal operation. This in turn will result in stronger human and institutional capacity for implementation and enforcement of natural resource related laws and policies.

To harmonize current institutional frameworks of environmental agencies, a team of legal experts will be formed under a reform committee to be established by the cabinet. The legal team will conduct in-depth review of the mandate, role and responsibilities of all environmental institutions with aim to identify duplicated and deficit areas and hence prepare a draft strategy highlighting a number of strategic options to rationalize the institutional framework. The daft strategy will be presented for stakeholder consultation workshop for their refinement and initial approval. The initially approved document will be subjected to second refinement by the Ministry of Legal Affairs (MLA) and then will be forwarded to the cabinet for final government endorsement. Having approved the strategic reform by the cabinet, the environmental institutions will be rationalized in accordance with new roles and mandates spelled out by the approved strategy. To put the new mandates in place, another legal team will be formed to review and amend organization

structure, job descriptions, by-laws/internal operation system of the newly established agencies.

EPA and GDFCD will mobilize financial resources from implementation of above sated restructuring activities and overall activities will implemented in collaboration with other actors, including EPA, Meteorological department of CAMA, GDFCD, MWE, MAI and MCS.

The institutional restructuring exercise proposed by NCSA action plan will ensure close linkages and synergies with on-going restructuring initiatives. Synergies with such initiatives will be **realized through** review of experience gained and results produced through such initiatives with aim to identify and replicate best practices and materialize on lessons learned during these reengineering process. Among the ongoing initiatives that are linked and have potential synergy with the proposed intuitional restructuring process are the Civil Services Modernization Project (WB), the EU project on support for administrative reform, and Health Reform Support Project (WB). More importantly, the intuitional restructuring process will build upon and synergize with the UNDP funded Programme on Sustainable Natural Resources Management (SNRMP), particularly upon its anticipated results which deals with harmonization of EPA mandate, updating of EPA organization structures and Job descriptions, in addition to endorsement of legal frameworks for the management of natural reserves.

6.2.2 Cross-sectoral Cooperation

Output 2.2: Strengthening environmental management through integrated and participatory management of natural resources at central and local level:

In 2001, the Government of Yemen designated EPA as a governmental agency responsible for integrating environmental concerns into national development policy, and as a regulatory oversight to coordinate environmental activities among relevant stockholders. The EPA was assigned as a Government agency responsible for monitoring compliance with obligations made under the CBD and the UNFCC conventions. Similarly, the Government has appointed GDFCD as a Government agency responsible for monitoring compliance with obligations made under CCD convention. Some of the synergic but common issues that affects EPA and GDFCD capacities to undertake their responsibilities effectively include, inter alia: lack of partnerships of private sector, NGOs and local community in environment management in addition to weak inter-institutional coordination collaboration among environmental partners associated with highly centralization in planning. All of these issues underpin the importance of a cross-sectoral approach in environmental management leading to unsustainable, ineffective and inefficient management of the country limited resources.

In order to rectify above issues and to vitalize community participation in environmental management, the action plan calls for shifting to decentralized management approach in environmental management. This policy option is line with Local Authority Law No. 4, which was decreed the cabinet in February, 2000. The law provides the local authority and communities the right to participate in monitoring and managing of local resources.

To facilitate shifting to a decentralized management, the action plan will, *inter alia*, create effective and viable district's managements for local environment, create mechanism for inter-village coordination, and strengthen the management capacities of local administrations and mechanism through appropriate raining. Similarly at central level, the action plan emphasis to promoting private sector, NGOs involvement in environment management and strengthening inter-institutional coordination collaboration among environmental partners trough creation higher level inter-institutional mechanism to oversight and monitor implementation of environmental policies. To facilitate private sector involvement in environmental management, the plan recommends adoption and enforcement of incentive, contractual and concession policies, particularly in the field of energy productions, pollution and waste mitigation, and EIA enforcement.

To sum-up, the action plan is designed to promote integrated and participatory management of natural resources at central and local level through the following priority measures and interventions:

- Promote participation of local authorities, community-based groups and private sector in environmental management.
- Create appropriate coordination bodies for management and use of natural resources at both national and local levels.
- Prepare by laws for smooth functioning of the coordination committees.
- Create inter-village coordination and participation mechanism for addressing common interests.
- Create environmental NGOs at local and central levels to act as advocacy groups to support environment protection.
- Activate private community involvement in environmental management through enforcement of contractual and concession policies, particularly with regard to energy productions, pollution and waste mitigation, and EIA enforcement.

The implementation of above-mentioned measures and actions **will result in** establishment and strengthening of inter-institutional collaboration mechanisms as well as strengthened executing institutions for environmental management at both national and local level. Nationally, the adoption of participatory inclusive mechanisms will help maximizing use of available resources of all actors towards meeting common goals, thereby avoiding any duplicated efforts particularly while addressing issues of cross-cutting aspects. At local levels, the enactment of community-based management models is anticipated to enable local communities meeting their needs while on the same time be effective partners in conservation and management on natural resources.

The NCSA intent is to enable governmental and nongovernmental environmental entities work together in addressing environmental issues. The **implementation strategies** to achieve this target involve, among others, establishment of inter-sectoral collaboration mechanisms, and inclusion of environmental NGOs, business sectors, and local communities in environmental management. The establishment of inter-institutional mechanisms will be realized by calling key environmental agencies to convene in order to agree on specific coordination mechanisms for the management of water, land, biodiversity and marine resources. Having identified the mandates and representations of each mechanism, each

mechanism will be publicly declared through establishment or ministerial decree as appropriate. To activate private sector involvement in the management of environmental resources through enforcement of contractual and concession policies, particularly with regard to energy production, pollution and waste mitigation, and EIA enforcement.

Again restructuring efforts identified above **will materialize on** results and experiences gained under UNDP Programme on Sustainable Natural Resources Management related to participatory management of nature reserves. The Programme through cooperation with EPA and local authorities has succeeded for the first time to create two self managed community-based management models for Jabal Bura'a National Park and Aden wetlands. These models will be studied, investigated, modified and used, where appropriate, to further promote local communities participation in protected area, rangelands and fishery management. EPA, GDFCD, MSRA, MFW, and local council authorities and NGOs, each in its respective area, will play leading role in replicating, enacting, and legalizing community-based management models be created.

6.2.3 Human Resources Development

Output 2.3: Strengthening manpower performance through systematic capacity building and motivation:

The intent of NCSA action plan is to enhance human resources conduct through the provision of systematic capacity building and creating motivative working environment. This will be achieved through, *inter alia*, formulation and implementation of Human Development Strategy and Recruitment Plans (HDSRP) aiming at filling gaps of human resources shortage and training needs of each of MEAs focal points. Each HDSRP will be developed based on training needs assessment and gap assessment of the manpower available for the EPA and GDFCD. The two focal points will then have to secure the necessary fund from government and international donors for implementing capacity building programs recommended by the HDSRP strategies. Recalling that the working environments within which national manpower work is not favorable for achieving and maintaining satisfactorily conduct, the NCSA action plan gives special attention for reversing this situation based on adoption of new employment policy oriented for, among other, creating fair and competitive salary scale, adoption of effective internal communication and networking system, and enforcement of internal monitoring systems for staff presence or performance.

To sum-up, this output is designed to addresses human resources development needs through the following priority measures and interventions:

- Gap assessment of manpower (EPA and GDFCD).
- Establish national data base for human resources (EPA and GDFCD).
- Training needs assessment (EPA and GDFCD).
- Prepare human development strategy and recruitment plans to fill the gaps.
- Implement capacity building programs (EPA and GDFCD).
- Provide adequate financial and material resources for MEAs focal points (EPA and GDFCD).
- Establish staff performance and control/appraisal system for the public administration (EPA and GDFCD).

- Enforce fair and competitive salary scale (EPA and GDFCD).
- Develop employment policy (EPA and GDFCD).
- Enhance internal communication and networking (EPA and GDFCD).
- Establish internal monitoring systems for staff presence or performance (EPA and GDFCD).

The implementation of Human Resources Development Strategy and Recruitment Plans (HRDSRP) as spelled out by this action plan **will result in** securing adequate manpower having high skills and capacity to perform their functions in environmental management more effectively. Further, the implementation of new salary scale together with rectifying internal working conditions of public administrations will halt brain drain to outside of the country or to business sector. These results will certainly enhance institutional capacity in addressing Yemen obligations at both national and international levels in more effective manners.

To formulate Human Resources Development Strategy (HRDSRP), two task forces composed of adequate national experts will be formed under MEAs focal points, EPA and GDFCD. The mission of each task force is to formulate Human Resources Development Strategy and Recruitment Plans (HRDSRP) based on gap assessment of manpower in addition to training needs assessment for manpower development in the two focal areas.

Having completed strategies' formulations, the EPA and GDFCD will be responsible for ensuring government endorsement of the strategies. Further, they should ensure incorporation of resources needed for implementation of each strategy in the public budgets after being approved by the Cabinet. The EPA and GDFCD, as focal points of UNFCCC, CBD, and CCD, will convey the HRDSRP strategies to potential international donors for negotiation and mobilization of more resources for implementing specific priority capacity building programs included in the strategies.

6.2.4 Strengthening EIA and Law Enforcement

Output 2.4: Strengthening law enforcement through updating and harmonization of environmental laws:

The lack of sectoral coordination and the exclusion of local community in law enforcement as well as the low public awareness on MEAs conventions are the major constraints behind outdated laws and laws' inadequacies. Not only this but also they are the key constraints hindering law enforcement and the sustainable utilization of natural resources. To abate these deficiencies, the NCSA strongly recommends the adoption of an integrated approach that ensure synergistic formulation and implementation of the MEAs issues. This approach will be pursued through establishment and strengthening cross-sectoral coordination mechanisms for revival, harmonization and enforcement of environmental laws in land, biodiversity and water management. At district level, similar approach will be applied with focus on revival of indigenous laws and activation of local people in law enforcement and management of natural resources. This later action will be completed by passing bylaws for institutionalizing statutory laws and participation of local people in the development and use of natural resources.

To sum-up, the output is designed to strengthen law enforcement through the following priority measures and interventions:

- Establish an effective coordination mechanism for revival, integration and enforcement of environmental laws (EPA, MAI, AREA, and GDFCD).
- Review and identify duplication and gaps of environmental laws (EPA, MAI, AREA and GDFCD).
- Update and harmonize laws (EPA, MAI, AREA and GDFCD).
- Institutionalize the promotion of community-based model in the management of natural resources nationwide (EPA, MAI and GDFCD).
- Enact local council law No. 4 by creating effective local management structures of natural resources (EPA, MAI, and GDFCD).

The above-mentioned interventions **will result into** establishment and strengthening of inter-institutional collaboration mechanism as well as strengthened executing bodies for law enforcement at both national and districts level. Furthermore, the production of this output is anticipated to yield to updating, creation and enforcement of the following laws and by-laws:

- New Update of Environment Protection Law (EPL) No. 26.
- Forestry and combating desertification laws.
- Bylaws of EPL and forest laws.
- By-laws for control of alien invasive species.
- Bylaw regulating fishing and use of proper fishing gears.
- By laws regulating community-based management for protected areas, rangelands, and fishery.

The creation of law enforcement mechanism together with the update and establishment of new laws are expected to result into harmonization of environmental laws and creating societal and organizations' supports for laws enforcements.

The **implementation strategy** for updating and harmonization of environmental laws will involve hiring consultants to review existing legislations, identify duplicated and/or deficiency areas, and develop or update environmental laws accordingly. The updates or new drafts of environmental laws will be presented to stakeholders workshops for amendment or approval as necessary. The initially approved document will be subjected to second refinement by the Ministry of Legal Affairs (MLA) and then will be forwarded to the cabinet for final government endorsement. Main environmental stakeholders concerned law development and enforcement are, but not necessarily limited to, the MLA, EPA, MWE, MAI, NWRA, Ministry of Electricity and Energy (MEE), MFW, NGO and Private Sector Representatives etc. Having approved draft laws by stakeholders workshops, the EPA, GDFCD, MSRA, each within its area of responsibility, will follow up the cabinet and parliament approval of environment protection law, forestry desertification law, and fishery by-laws etc. To ensure overall law enforcement, several central and specific sites coordination mechanisms for enforcement of environmental laws will be established (EPA, MAI, and GDFCD).

EPA will mobilize financial resources for harmonization and update of environmental laws and overall activities will be implemented in collaboration with key environmental actors, including the MLA, EPA, MWE, MAI, NWRA, MFW, and MCS.

6.2.5 EIA Enforcement

Output 2.5: Strengthening enforcement capacity of EIA:

To enhance the EIA enforcement by national agencies, the action plan focuses mainly on improving and strengthening the managerial and technical capacity of the EPA through the provision of physical infrastructure and facilities and provision of appropriate training. Specific attention is given to establishment of laboratories for air, water, and soil quality along with enhanced staff capacity in preparing and implementing EIA. Given the regulatory deficiencies responsible for EIA weak enforcement, focus is also given for elaboration of EIA by-laws, procedures, criteria, and responsibilities for EIA application and enforcement.

To sum-up, this output is designed to strengthen EIA enforcement through the following priority measures and interventions:

- Subject overall development projects, programmes to EIA.
- Establish and enact by-laws penalizing EIA violation.
- Create branches for (EPA) in major agro ecological zones.
- Build the capacity of EIA unit of EPA on EIA development and enforcement.

The enactment of EIA, particularly, on large and medium-scale development projects **will reduced** pressures on environmental destructions of forest, mangroves and lagoons incurred due to violation of EIA regulations. Capacity building and the provisions of infrastructure and human resources to EPA will ensure EIA enforcement.

EIA regulation will be enforced by providing private sector incentive against EIA compliance and introduction of clean technologies. Clarification of regulation will be promoted by enhancing business community awareness on EIA regulations and benefits particularly in energy sectors.

6.3 Research and Technology Development

Strategic objective 3: Streamlining research effort to improve understanding of the natural resources capacity to deliver goods and services and support livelihoods of Yemeni people sustainably:

6.3.1 Stimulation of Integrated Researches

Output 3.1: Stimulate integrated research on natural resource:

Better and more comprehensive understanding of the state and trends of environmental variables and of their causes is most important for implementing sound environmental strategies, that keep natural resources use within the limits of each respective resource. Recognizing this fact and recalling that research institutions have inadequate capacity to produce informative research for this



purpose, the main action plan concern is to enable national institutions promoting integrated research on natural resource with aim to visualize and providing clearer insights on environmental status for policy makers so that they can produce sound environmental strategies.

Key areas of research are as follows (not in order of priority, which is changeable over time):

- Taxonomies of living natural resources.
- Research to better understand ecological processes and habitats.
- Research to visualize environmental status, including erosion control, terrace cultivation, watershed management, hillside farming, the rescue of traditional technologies, and improved utilization and production of fuel wood.
- Research on disaster preparedness and response.
- R&D on know- how, practices, methods and technologies for environmental management and clean production and applications.

To put into effect integrated research in this scale, there is an urgent need for improved information base, skilled expertise, and improved systems for environmental monitoring including man-made and natural disasters.

To sum-up, this output is designed to promote integrated research on natural resource through the following priority measures and interventions:

- Experts committee for coordinating integrated research (EPA).
- Initiate researches on, rare and endangered species and their habitats (EPA).
- Research on critical habitats, including methods to restore and maintain the ecological functioning of biodiversity components (EPA).
- Undertake stock assessment studies for the living marine resources.
- Initiate research to quantify and forecast the response of genotypes, species, habitats, ecosystems and landscapes under anticipated climate change.
- Develop methodologies for adaptation and conservation policies.
- Assessment on needs to adapt and mitigate climates change.
- Assessment needs for mitigating impacts of earth quake, land slides and industrial accidents.
- Develop flora, fauna, terrestrial and marine inventories.
- Provide funds and infrastructure for research institutions to develop research programs in the target areas.
- Conduct forest, range, soil and desertification surveys.
- Support traditional and environmentally sound land use practices.

Through the set-up of research coordinating committee, research website, and information networks between key research institutions, **it is anticipated to result into** creating effective working environment for conducting and disseminating objective researches to public, which in turn will enhance the public knowledge on the state and trends of environmental variables and of their causes, leading to better environmental management.

To promote integrated research, experts coordinating committee will be established with aim to facilitate data dissemination and studies on environmental degradation, streamline integrated-oriented research, and identify relevant technologies needed

for conducting research in the main three environmental areas (climate change, biodiversity and land degradation). Potential members of this committee will include senior experts from EPA, GDFCD, AREA, NWRA, MEE, MSRA, CAMA, and NGOs and private sector representatives as necessary.

To ensure free flows of research findings, funds will be ensured for establishing website, and information networks between key competent institutions.

6.3.2 Strengthening Environmental Monitoring and Disaster Preparedness

Output 3.2: Promoting the transfer and application of science and technology in the management of natural resources, and monitoring of causes and consequences of man-hazards and natural disasters on natural resources.

Establishment of effective systems for environmental monitoring is prerequisite for environmental quality assessment, conducting objective research, pollution control, and mitigation of adverse impacts of man-made and natural disasters. The national capacity of research institutions to produce purposeful research and provide early warnings on scale, source and nature of potential natural and man-made disasters is very modest. This is mainly attributed to the low country financial capacity to access and transfer technologies, particularly with regards to new techs on surveillance, and early warning systems for weather prediction, draught and flood monitoring. Under these capacity constraints, Yemen is being progressively under the consequences of many man-made hazards and natural disasters, including land slides, flash floods, dust and sandy storms, earthquakes, air pollution, and oil spills associated with potentials fires.

If this situation remained unchecked, the country will continue under the threats of frequent occurrence of above mentioned phenomena, causing increased degradation of natural resources and loss of lives. To mitigate the adverse impacts of man-made hazards and natural disasters, the action plan calls for establishment and maintenance of an integrated national early warning system under the umbrella of EPA. The aim of the system is to promote integrated research, and hence enhance national disaster preparedness and response towards such phenomena. Such a system should be able to address the various aspects of early warning, not only cyclones, but also other issues of concern such as flash floods and drought. On the other hand, Yemen should be integrated into regional early warning systems (underdevelopment) for which the plan gives attention for establishing adequate observation networks for monitoring environmental parameters and variables. This will be further strengthened by establishment of GIS system and appropriate networking to link all research institutions to the central warning system at EPA.

Capacity building is an important component of the action plan focuses on providing appropriate training on various environmental disciplines, including training on newly introduced technologies and monitoring equipments.

To sum-up, this output is designed to promote the transfer and application of science and technology in the management of natural resources through the following priority measures and interventions:

- Promote satellite based for monitoring natural resources, including monitoring extreme weather events such as and drought cyclones, and floods rains etc.
- Establish information systems, including networks, application and expansion of GIS systems (EPA, GDFCD, AREA, MEE, MSRA, NWRA and CAMA).
- Develop adequate networks for observation and monitoring of environmental variation (EPA, NWRA and CAMA).
- Revive and apply traditional knowledge, innovation and good practices in environmental management (EPA, GDFCD, AREA, MSRA, NWRA).
- Promote research on renewable and alternative energy (EPA and MEE).
- Develop capacity of Meteorological department in weather monitoring and predictions of extreme weather events (CAMA).
- Provide national experts with specialized training on: biodiversity assessment, (MSRA and EPA).
- Provide training on GIS systems and networking (EPA, NEIC, GDFCD, AREA, MEE, MSRA, NAWRA and CAMA).
- Provide funds to EPA, NEIC, GDFCD, AREA, MEE, MSRA, NWRA and CAMA to develop research programs in the above target areas.
- Provide training on climate molding, climate scenarios and projection of GHG emissions (EPA and CAMA).
- Capacity building through providing appropriate training on various environmental disciplines, including training on newly introduced technologies and monitoring equipments (EPA, GDFCD, AREA, MEE, MSRA, NWRA and CAMA).

The acquisition of satellite-based system for monitoring drought, cyclones, and floods rains along with training on newly introduced technology **will enable** the research institutions to disseminate early warnings on natural disaster occurrence to the public so that they can act early enough to safe their lives, properties and minimize natural resources depletion.

The set-up of an early warning system together with establishment of adequate hydro meteorological networks, database and GIS systems, and an appropriate networking between research institutions, **will enable** the research institutions to create reliable information base for effective planning of natural resources. In addition, the existence of effective information networks will facilitate the continues flow of environmental information between institutions hence leading to enhancing experts understanding and knowledge on causes and consequences of man-hazards and natural disasters on natural resources.

The EPA will mobilize the resources needed for implementation of whole actions planed under this output.

6.3.3 Data and Information Collection, Dissemination and Monitoring

Output 3.3: Strengthening information base and free flow environmental information:

Availability and accessibility of reliable information is a prerequisite for developing sound environmental policies as well as enhancing outcomes of environmental research. In addition, data availability and accessibility is critical for producing effective awareness Programmes. This output is, therefore, designed to address data shortage and inaccessibility through a wide range of policies and instruments including the following: development and implementation of ICT strategies; establishment of information systems; deployment of modern communication and networking technologies; enhancement of personnel capacities of research center, MEAs focal points, awareness units and media. To enhance overall information quality, this output calls for standardization of data collection, processing and analysis formats in addition to automating and upgrading of data collection and processing facilities along with provision of training in this regard. Furthermore, the output calls for the set-up of environmental communication units at EPA and active research centers, and to equip them with appropriate electronic networking systems for data acquisition, and production and dissemination of environmental information and awareness and research products. In view of capacity building importance for the effective operation and maintenance of the communication units, this output emphasizes on providing training to media and communication units' personnel on newly introduced facilities, and on data acquisition, processing, and production and dissemination of awareness materials. To improve public awareness on environmental issues, special training programmes for mass media practitioners/reporters will be provided.

To sum-up, the action plan is formulated to strengthen inter-agency communications through the following priority measures and interventions:

- Conduct needs assessment study for improving data collection processing, retrieval and communication.
- Formulate ICT development strategy for MEAs focal points and research institutions.
- Establish environmental communication units in relevant environmental agencies.
- Conduct needs assessment study for improving data collection processing, retrieval and dissemination.
- Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information.
- Train staff of media and communication units on data acquisition, processing and production and dissemination of awareness materials.
- Carryout inventories of environmental, resource and development data for determining gaps and organizing activities to fill those gaps.
- Establish systems to verify quality of data gathered, i.e., a source check.
- Establish procedures for measurement and evaluation.
- Organize continuous and accurate data-collection systems, making use of GIS, databases, expert systems, models, and the like.

The implementation of above activities **are expected** to strengthen information collection, analysis and exchange, and put in place frameworks and protocols, and strategy for exchange of information and monitoring of natural resources. Specifically, the implementation of ICT strategy, provision of ICT and data management technologies, and application of unified data and collection and processing formats will improve overall quality, validity and reliability, coverage and timeliness of and access to environmental information. The upgrading of data collection and processing equipment will improve efficiency of data production.

Implementation of this output will involve hiring consultants to conduct ICT needs assessment and hence developing ICT development strategy for focal points and research centers. Also national consultants will be hired for training manpower data collection analysis storage, dissemination to end-users. Furthermore, focal points and research centers will be equipped with ICT equipment for data management and information sharing between relevant data users. The EPA and GDFCD will mobilize the resources for implementation of these activities in collaboration with other actors, such as GDFCD, AREA, MEE, MSRA, NAWRA, CAMA, and Aden Universities.

6.4 Rising Environmental Awareness and Education of Yemeni Society

Strategic objective 4: Rising environmental awareness of Yemeni society by integrating environmental themes in university and school curricula, promoting green media, and launching nationwide public awareness campaigns:

6.4.1 Raising Environmental Awareness

Output 4.1: Raising environmental awareness through a nationwide public campaigns, and national Programmes for integrating environment themes into national educational curricula at all education levels:

As described earlier, environmental awareness among young, decision-makers and media communities is generally low. This lack of awareness is attributed to inadequate integration of environmental issues into formal education programs and curricula in addition to the weak capacity to implement nationwide environmental public awareness campaign and Programmes. This status is further complicated by the lack of awareness and communication tools for the timely dissemination of environmental information and awareness products. In response to this situation and in order to create positive attitudes towards these issues there is a need to foster a sense of personal environmental responsibility, and greater motivation and commitment towards involvement in sustainable development problems and solutions. To achieve this, the action plan main focus is to create and implement an awareness strategy with aim to promote broad environmental awareness and understanding among all sectors and levels of society. In addition, the plan intent is to strengthen inter-agency communications for awareness material exchanges, and to promote integration of environmental themes into formal education system.

In order to address the issue of low environmental awareness among various sectors of Yemeni society, the action plan contains wide range of policy and instrument, such as: developing a national strategy that addresses issues of environmental awareness; the effective integration of new environmental themes into the educational and training system, launching a nationwide public campaigns and Programmes for enhancing public awareness of different audiences, and expansion and creation of environmental advocacy groups among youth. Furthermore, strengthening public education on environment is an important element of action plan and will be produced based on review of curriculum, production of education/teaching materials and orientation of teachers towards environmental themes.

To sum-up, this output is designed to address low level awareness issues of Yemeni society through the following priority measures and interventions:

- Prepare national awareness strategy on values, importance and maintenance of major environmental assets (EPA).
- Promote environmental public awareness campaign through TV and radio mass media, community workshops, fact sheets and brochures production, electronic information and other communication materials (EPA).
- Expand establishment of green media and NGOs to act as advocacy groups for the protection of nature and the environment (EPA, Civil society, and Ministry of Labor and Social Affairs).
- Promote and facilitate community awareness and involvement in protection of environment (EPA and local authority, NGO and community).
- Assess capacity needs for incorporating environmental themes into schools and universities curricula (Universities, Ministry of Education (MOE), and Ministry of Higher Education (MOHE)).
- Develop Programmes for integrating environment themes into educational curricula at all education levels (Universities, Ministry of Education, and Ministry of Higher Education).
- Integrate green themes into the education curricula of schools and universities (Universities, Ministry of Education, and Ministry of Higher Education).
- Develop training programs for teachers, to enable them developing and teaching environment themes (Universities, Ministry of Education, and Ministry of Higher Education).
- Establishment of youth green clubs in schools in all governorates (EPA and Ministry of Education).

The implementation of the above-mentioned interventions will help formulating and implementing environmental awareness strategy, awareness campaigns and Programmes, and curriculum Programmes and modules for integrating environment themes into educational curricula at all education levels. Furthermore, it will create environmental advocacy and lobbyist groups among public and youth to support the environmental issues. These collectively are **expected lead to** enhanced public awareness, understanding and skills on specific environmental topics leading in turn to constructive change of society and individual attitudes, knowledge, behavior and actions with regards to environmental issues.

The output will be **implemented through** contracting national experts from Curriculum Development department under the Ministry of Education (MOE) to



review curricula of primary and secondary schools and prepare training modules for teaching environmental topics at schools levels. Similar approach will be adopted for integration of environmental topics into universities, making use of expertise available for Sana'a and Aden universities. For each of school and university levels, a national scientific environmental education coordinating committee will be formed to act as oversight body responsible for implementation of overall activities of Curriculum Development and reform, including selection and approval of experts products. Each committee will be formed from representatives of various environmental, developmental, educational, gender, and other non-governmental agencies. This approach will help mobilizing adequate resources from all partners and encourage partnerships and information exchange.

Such a coordinated way, will ensure development of training programs for teachers, administrators, educational planners that identify all capacity needs for curriculum reform, including best methods of incorporating environment and development into education systems. The EPA and GDFCD will mobilize resources for implementing this output and the Ministry of Higher Education in close consultation with Sana'a and Aden universities, private universities will lead overall curriculum development process, including the formation of oversight bodies. On the other hand the responsibly of curriculum development of schools will be led by the Ministry of Education and under which the oversight committee will be established.

The implementation of the other elements of this output will be coordinated by EPA. The EPA will collaborate with national experts and intuitions of excellence and other actors such as environmental NGOs private consultancy offices, etc. to prepare awareness strategy, launch and organize awareness Programmes for targeted audiences, and organize mass media programs.

6.5 Conservation and Sustainable Use of Natural Resources

Strategic objective 5: To promote the conservation and sustainable use of natural resources:

6.5.1 Sustainable Land Use

Output 5.1: Promoting sustainable land use management plans and practices:

As the National Focal Point for the Convention and as coordinator of the national action plan to combat desertification (NAPCD), the General Department of Forestry and Combating Desertification (GDFCD) will create and reinforce mechanism for co-ordination of bilateral and multilateral assistance Programmes, and then will mobilize resources for updating and implementation of the NAPCD. Given that the successful implementation and planning of NAPCD is largely determined by institutional efficiency and the extent of public commitment and participation, the action plan focuses on the need to develop an understanding of the significance of desertification and to ensure public participation at in management and planning of land resources. In this context, GDFCD needs to be restructured with aim to harmonize its mandates, and to clarify its responsibilities over management of lands resources and this issue was deal with as crosscutting

issue. Further, the country capacity to monitor and understand desertification impacts will be improved through establishment of development of meteorological and hydrological networks, improvement of the climatologically data base; and enhanced research and assessment of climate and desertification aspects, including droughts.

Emphasis will be given to establishment of an early warning system against severe droughts, and continued assessment of the status of desertification and its relationship to droughts and human activities and to tackling desertification through an integrated, interdisciplinary approach, taking into account ecological, hydrological, social, economic, political and cultural conditions. Special emphasis will be placed on deploying geographical information systems to improve methods of assessing and monitoring desertification. Particular attention will be paid to the introduction of environmentally sound methods and practices, including revival of indigenous techniques with regard to farming, terraces maintenance, agroforestry and rang management. To prevent the advance of desertification and, to reclaim decertified land for productive use the plan gives due attention for implementation of a long-term Programmes, involving afforestation, agroforestry, terraces rehabilitation, dune and wadi bank stabilization, shelters belts, greenbelts and windbreaks, and watershed management and protection.

To sum-up, this output is designed to addresses land degradation issues through the following priority measures and interventions:

- Mobilize resources for updating and implementation of the NAPCD (GDFCD).
- Application of methods for assessing and monitoring desertification processes; mapping of sand dunes and degradation in decertified rangelands; surveying and mapping of decertified lands; strengthening computerized geographical information systems for use in assessing and monitoring desertification (MAI, GDFCD and AREA).
- Promote public participation in land management (MAI, GDFCD and AREA).
- Harmonization of GDFCD mandates and role (MCS, GDFCD, EPA, MAI and MWE).
- Development of meteorological and hydrological networks, and improvement of the climatologically data base; research and assessment of climate aspects of desertification, including droughts (GDFCD, CAMA and AREA).
- Establishment of early warning systems for drought preparedness, and for combating desertification (CAMA, GDFCD, NWRA, AREA, MAI and MWE).
- Continued operation and extension of network of integrated research, training and demonstration pilot projects in arid lands (GDFCD and AREA).
- Revival and application of traditional systems terraces and rangelands conservation and in water sheds (GDFCD, AREA, and MAI).
- Mobilizing resources for demonstration and application of appropriate methods for reducing wind and rainfall erosion, stabilize dunes, surface-water harvesting and ground-water; assessment, development and management of ground-water resources in critically decertified areas (GDFCD, CAMA and AREA, MAI, and NWRA).
- Prepare and implement rangelands management plans.
- Mobilizing resources for initiation and management of pilot projects for integrated village development and grazing-lands rehabilitation (GDFCD,

- AREA, and MAI).
- Promoting the use of natural fertilizers in replacement of imported agrochemicals (GDFCD, AREA, and MAI).
 - Promoting the integrated pest management techniques (GDFCD, AREA, and MAI).
 - Implementation of a long-term Programmes, involving afforestation, agro forestry, terraces rehabilitation, dune and wadi bank stabilization, shelters belts, greenbelts and windbreaks, and watershed management and protection (Ministry of Finance, Ministry of Planning, EPA, GDFCD, NWRA, AREA, MAI and MWE).

The implementation of above interventions **will greatly improve** national capacity in addressing various desertification aspects. In particular, the implementation of NAPCD, rangelands management plans, afforestation, agro forestry, terraces rehabilitation, and sand dune fixation Programmes, will collectively result into rehabilitation of forest lands, natural habitats, and reclamation of fragile lands for productive use. In addition, current agricultural production level is expected to be improved as a result of the revival and application of good land use practices. These practices are also **anticipated** to help in preventing the advance of desertification and deterioration of agricultural and rangelands.

Through expanded meteorological networks and introduction of an early warning system for weather predicting, it **is expected to** strengthen national monitoring capacity against drought and desertification and hence improve country adaptation and preparedness for mitigating potential impacts of such features.

The increase of natural vegetation **is likely to** maintain and/or enhance soil stability and ecosystem integrity and will also promote soil biodiversity function.

Of key **implementation strategies** to produce this output is to capitalize on local people, indigenous practices and knowledge for the revival and application of traditional systems on terraces rehabilitation, rangelands conservation, desertification control, and water sheds management. This will be achieved through the formation of farmers' and community-based groups for communal rehabilitation of terrace fields and water tanks, tree planting, environmental awareness raising, introducing irrigation methods, and shoring up valley walls to reduce water erosion.

National experts will be hired for consultation with local people with aim to compile, document, demonstrate and applied feasible and appropriate methods in critically decertified areas. Experts will and research institutes will also help in the demonstration of innovative and sustainable agricultural techniques which will broadly be advocated in order to improve the management practices of natural resources in Yemen.

As for formulation of rangelands management plans experts will be hired to guide local framers in developing the plans and demonstrating participatory institutional arrangements to implement the plans. Consultants will further develop guidelines for integration of sustainable land management practices into range land plans. GDFCD and AREA in collaboration with EPA, MAI, NWRA, MWE, local

councils, local communities, and local NGOs will implement and monitor range land use under different ecosystems.

6.5.2 Conservation and Sustainable Use of Biodiversity

Output 5.2: Strengthening Ex-situ and in-situ conservation Capacities:

This output aims at promoting the conservation and sustainable use of biological resources through maintaining representative genetic diversity of specific plant and animal species of potential socio-economic values. Particular attention is given to strengthening and expansion of multi-purposes protected areas, protection and development of wetlands ecosystems, particularly those of importance for local community, and survival of wild species. This output is to be realized through the implementation of a wide range of policy and instruments, such as: implementation of conservation strategies and rehabilitation plans for endangered species; promotion and legalization of community-based management of protected area; expansion of in situ and ex situ conservation programmes for endangered species; research, mapping and surveys of wildlife and habitats; and strengthening capacity for *ex-situ* conservation, including the maintenance of biodiversity data bases.

To sum-up, this output is designed to strengthen ex-situ and in-situ conservation capacities through the following priority measures and interventions:

- Formulate a national policies for the protection of flora, fauna and their habitats (EPA);
- Promotion of the conservation and development of protected areas through the formulation and implementation of community-based management plans (EPA);
- Prepare and implement recovery and rehabilitation plan for threatened plant and animal species (EPA and local authorities);
- Formulation of relevant instruments to govern accessibility to crop plant genetic resources (AREA and EPA);
- Establishment and maintenance of data bases on plants, animals and protected areas (EPA);
- Assessment of the status and trends of wildlife and habitat conservation (EPA);
- Assessment and management of *ex situ* crop and fodder plant genetic resources (EPA and AREA);
- Mapping and prioritization of threatened endemic species and habitat (EPA);
- Development of guidelines for collection, maintenance and reintroduction of plants and animal species in ex-situ programmes (AREA and EPA);
- Research and surveys on endangered flora and fauna (EPA);
- Development and strengthening capacity for *ex-situ* conservation through the establishment of gene banks, seed banks, national herbarium, natural history museum and public gardens (EPA, AREA and local councils);
- Use of a combination of in situ and ex situ conservation to maintain species and genetic resources (EPA and AREA).

Of **key results to be realized** under this outputs include, among others, implementation of conservation strategies, and recovery and rehabilitation plans; establishment of gene banks, seed banks, and public gardens; establishment of a comprehensive national ex-situ and in-situ genetic conservation system; the operation of the national herbarium and natural history museum, and the existence



of adequate and reliable information base and knowledge. The production of such results will generally contribute to strengthened institutional capacity, increase trained manpower, put in place guidelines and regulations and provide knowledge in form of studies for the conservation of biodiversity. Acquisition of facilities, such as herbaria in institutions and the national museum would strengthen institutional capacities to implement biodiversity programs. On the other hand, the acquisition of data base as well as the implementation of research, mapping and surveys activities will promote collection and existence of adequate and reliable information base and knowledge needed for the sound planning and management of biological resources. The devolution of management responsibility of protected area to local community level will facilitate implementation of conservation strategies and plans.

The NCSA action plan will be **implemented through** a number of options, including local participation in protected area management and planning, consultant, training of personnel, exchange of information, development and maintenance of data base on species and protected areas. Combining *ex situ* and *in situ* conservation and promoting the exchange of information related to genetic resources between local data producers is emphasized in the plan. More attention will be given to improving traditional plant cultivars, and animal breeds. EPA will continue to undertake significant activities related to the management of biological resources and protected areas, and AREA will be heavily involved in related research and training. EPA will continue to support monitoring and assessment and will promote the conservation of biological diversity through the integrated planning and management of natural systems. Collaboration co-ordination among the organizations most directly concerned with conservation will be actively pursued through the ecosystem conservation mechanism, involving EPA, GDFCD, MAI, MWE and research institutions. This mechanism will ensure that the main interventions of this output, the NBSAP conservation strategy, protected area Programmes, and recovery and rehabilitation plan for threatened species are integrated into development Programmes. This output will be carried out at national, district and community levels, and will be coordinated by AREA and EPA in collaboration with other research institutions, NGOs and local communities.

6.5.3 Biosafety

Output 5.3: Strengthening institutional capacity of the National Committee for Biotechnology and Biosafety:

The action plan emphasizes the use of appropriate biotechnologies in environmental management, and the formulation of safety criteria and guidelines for biotechnology. So the expected output 5.3 seeks to strengthen institutional capacity on Biotechnology and Biosafety.

The plan proposes a number of measures and actions including institutional restructuring, strengthening of natural resources planning and management capacities, establishment and operation of environmental monitoring systems, upgrading of legal frames and information bases, resource mobilization and support participation of relevant agencies, target groups and local communities.

To sum-up, this output is designed to address low level awareness issues through a number of priority measures and interventions including the following:

- Prepare and apply national policy for bio-technology and Biosafety.
- Assess options for the safe transfers and use biotechnologies.
- Establish data base for Biotechnology and Biosafety and activate information exchange programme.
- Control and manage the side effects of using the genetically modified organisms.
- Strengthen the capacity of organizations in the field of Biotechnology and Biosafety through establishing specialized laboratories and train the local staff.

6.6 Sustainable Climate Change and Energy Management

Strategic objective 6: To mitigate the adverse impacts of climate change:

Output 6.1: Strengthening Mitigation and Adaptations Capacity:

This output is designed to develop sustainable energy systems while mitigating existing adverse environmental effects and mitigating or preventing future adverse effects, in a manner consistent with other economic and social objectives. Further, it seeks to develop adaptation strategies and programs for priority sensitive areas.

The action plan involves a number of priority interventions and actions which can be clustered under five category areas:

- 1) Creation of enabling environments through policies and strategy development and planning for effective environmental management, special focus will be given to development and implementation of national mitigation plan for energy sector, and development and implementation of National Adaptation Programme of Action (NAPA);
- 2) Strengthening Partnership and relations with business community to promote clean technologies in industrial and energy sectors;
- 3) Mobilization of information and knowledge through enhanced climate change and technology research and information networking;
- 4) Strengthening public awareness on climate change, mostly through imparting knowledge and developing skills through training and capacity building; and
- 5) Capacity development at the organizational level - overall performance and functioning capabilities, such as developing mandates, tools, guidelines and information management systems for the ability of the organization to adopt change.

To sum-up, this output is designed to strengthen mitigation and adaptations capacity through the following priority measures and interventions:

- Enhance the capacity of the joint mechanism of the CDM, to enable it to fulfill its role.
- Enhancement of the newly established CCU to continuously handle climate change issues, whether on the national, regional or international level.
- Develop and implement national mitigation plan for energy sector.

- Promote adoption of clean technologies by industry, in particular in the small and medium sector, through regulatory and fiscal measures, and standards setting.
- Develop and implement a Policy framework and a National Adaptation Programme of Action (NAPA) to adapt to climate change in most vulnerable sector to anticipated climate change.
- Enhance information base through creating and maintaining a national climate change web page with links to national, regional and international sources of information.
- Create a database on clean technologies, and promote dissemination of new technologies developed both in Yemen and abroad.
- Promote climate change and technology research.
- Increase awareness of decision makers and encourage/support research community.
- Provide training to new GHG inventory experts and university students for each GHG inventory category.
- Building capacity in developing and appraising clean technology switchover and project proposals.

The implementation of national mitigation plans (NMP) along with the promotion of clean technologies, and the enforcement of norms, bench marks and standards **are expected** to result into rational energy use, thereby causing significant reduction of CO₂ emissions from energy sector, householder, industry and transport sectors. On the other hand, the implementation of the National Adaptation Program of Action (NAPA) will create enabling environment for adaptation to climate change in target areas.

Through the establishment of climate change web page and database it is **expected** to contribute to the expansion of the knowledge base on climate change and clean technologies and strengthened institutional capacity to formulate and implement programs on monitoring, adaptation and mitigation of climate change.

The substitution of kerosene and fuel wood by renewable energy **are anticipated** to promote lower cost options in energy production and consumptions, while on the same time minimize the consequent impacts of energy pollutions on the environment and public health. In addition, the shift to renewable energies **will ensure** higher population access to electricity, especially in the rural poor areas, thereby improving the quality of life of rural area and usage of fuel wood and reducing the pressure on natural resources. The planting of trees alongside the terraces **will** create a habitat for endangered bird species and other animals, and at the same time will positively impacts on the capability of the mountain area to function as a watershed for lower lying areas.

The action plan calls for increase population access to electricity by promoting less polluting and lower cost options in energy production and consumptions. This **will be achieved** through appointment of a team of experts to advise the national committee for clean development on potential options for renewable energy.

The use of new techniques and technologies that are economically and environmentally viable will be promoted through enhancement the role of the newly Clean Development Mechanism (CDM). The involvement of private sector in this mechanism is vital it will facilitate development and application of efficiency standards for lighting and heating system, application of buildings energy-related codes, enforcement of appliance efficiency standards, and promotion of pilot projects on renewable energy, including bio-energy production especially from solid waste of main cities. The inclusion of academic and research institutions **will facilitate** technology research for the safe transfer and viable technologies and this will be achieved through identification and evaluation of clean technologies, formulation of CDM projects, development of criteria for environmentally sustainable energy development, and development of baseline studies for planning and policy development... etc.

Based on baseline studies, National Mitigation Plan (NMP) for energy, transport, household, and industrial sectors will formulated and implemented after being approved by relevant government institutions. Focus should be given to introduction and enforcements of norms, bench marks and standards; fuel switching to natural gas in energy generation and transportation; switching to renewable energy; promote bio-energy production from wastewater and solid waste; application of efficient lighting system and efficient heating and cooking systems; increase of Liquid Petroleum Gas (LPG) use for cooking and improve biomass and LPG stoves performance. Similar approach is being followed in formulating and approving the National Adaptation Programme of Action (NAPA), which is currently under final government approval. Yemen NAPA identifies a comprehensive range of climate change adaptation strategies for agriculture, water and marine sectors. The NAPA explores potential measures and actions to address adaptation needs, lays out a detailed environmental action program, and enumerates priority actions – both sector-specific and for institutional capacity building. Specifically, it contains measures designed to reduce water scarcity, and others improve agricultural production under erratic rains and changing climatic conditions. In the coastal areas it calls for integrated coastal zone management and improving monitoring capacities against anticipated sea level rise and extreme weather events. Following NMP and NAPA approval, the EPA, GDFCD, MEE, NWRA will work together to ensure resources needed for the implementation of the two plans.

7 ANNEXES

7.1 Annex (1): NCSA Action Plan

7.2 Annex (2): Thematic Assessment Issues\ Gaps

7.2.1- Desertification Issues\ Gaps

7.2.2- Biodiversity Issues\ Gaps

7.2.3- Climate Change Issues\ Gaps

7.3 Annex (3): Cross-cutting Issues\ Gaps

7.4 Annex (4): Project Profiles

7.5 Annex (5): Past and On-going Environmental Projects

7.6 Annex (6): Tables of Environmental Laws and Bylaws Produced by the Government

7.7 Annex (7): List of National Consultants

7.1 Annex (1): NCSA Action Plan:

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
Strategic Objective 1: Strengthening the performance of environmental policies through the promotion of participatory national and local planning of natural resources					
<p>Output 1.1: Integration of environmental concerns in policies, plans, programmes, and projects for economic and social development</p> <p>Baseline:</p> <ul style="list-style-type: none"> • Inadequate policy framework for integrating MEA issues into the national/district development planning. • Lack of policy guidelines to mainstream MEAs issues into general planning and strategy formulation at central and district levels. • Lack of suitable systems for forestry and natural rangelands management. 	<ul style="list-style-type: none"> ▪ Study and review policies. ▪ Develop and enact common guidelines for mainstreaming Environmental issues in the national and district development plans. ▪ Readjust national and local development plans and strategies to account for environmental issues, livelihoods of local communities and global commitment. ▪ Develop and promote participatory mechanism for developing and implementing integrated land and water use plans, including integrated watersheds, Marine and coastal area management. ▪ Restructure environmental policies to meet international needs and sustainable management and use of natural resources. 	<ul style="list-style-type: none"> ▪ Five integrated forest management plans formulated and implemented in Bura'a, Hawf, and Socotra. 	EPA, MAI, GDFCD	\$ 320,000	Two years
		<ul style="list-style-type: none"> ▪ Four integrated range management plans formulated and implemented. 	EPA, GDFCD, AREA, MAI	\$ 120,000	Two years
		<ul style="list-style-type: none"> ▪ At least six watershed management plans implemented. 	NWRA, MWE	\$ 300,000	Two years
		<ul style="list-style-type: none"> ▪ At least six integrated marine and coastal management plans implemented in the Arabian Sea, red sea and Socotra islands implemented. 	EPA, MSRA, MFW	\$ 300,000	Two years
		<ul style="list-style-type: none"> ▪ At least twelve fisheries management plans implemented. 	EPA, MSRA, MFW	\$ 120,000	Two years
		<ul style="list-style-type: none"> ▪ Yemen wet lands use policies formulated and approved. 	EPA, MSRA, MFW, Local communities	\$ 15,000	One year
		<ul style="list-style-type: none"> ▪ Management plans for Aden wetlands, Al-Luhaia, Guriara and Kamaran implemented. 	EPA, AREA	\$ 60,000	Two years
		<ul style="list-style-type: none"> ▪ Policies and land use & land tenure formulated & applied. 	EPA, GDFCD	\$ 120,000	One year
		<ul style="list-style-type: none"> ▪ A national plan on control and use of alien invasive species developed and executed. 	EPA, AREA, GDFCD, MAI	\$ 50,000	Two years
		<ul style="list-style-type: none"> ▪ A rational water use policy formulated and applied for irrigation, households, and industries. 	EPA, GDFCD, AREA, MAI	\$ 30,000	Two years
<ul style="list-style-type: none"> ▪ Guidelines for integrating climatic issues in the land use planning developed and applied. 	EPA, MWE, MAI, WRA, GDFCD, MFW, MEE, MSRA, CAMA	\$ 60,000	Two years		
<ul style="list-style-type: none"> ▪ A plan for rehabilitation of degraded natural habitats prepared and implemented. 	EPA, MSRA, AREA, GDFCD	\$ 120,000	Two years		
<ul style="list-style-type: none"> ▪ A plan on for revival of best traditional knowledge of herding practices & rotational use of ranges implemented. 	AREA, GDFCD	\$ 40,000	One year		

Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 1.2: Promotion of participatory national planning of natural resources</p> <p>Baseline:</p> <ul style="list-style-type: none"> Weak inter-institutional coordination & mechanisms for developing harmonized environmental policies. 	<ul style="list-style-type: none"> Identify and enact an inter-institutional coordination mechanism for integrating and implementing environmental policies. Stimulating and expanding public-community partnerships in the planning and Management of natural resources. 	<ul style="list-style-type: none"> Four inter-institutional coordination mechanisms for policy development established for land, marine, water and energy sectors, including disaster management. 	EPA, MWE, GDFCD, AREA, NWRA, MFW, MSRA, MAI	\$ 100,000	One year
		<ul style="list-style-type: none"> Public-community partnerships in the planning and Management of natural resources expended. 	EPA, Local communities	\$ 100,000	Two years
<p>Output 1.3: Strengthening local community involvement in planning the protection of environmental resources</p> <p>Baseline:</p> <ul style="list-style-type: none"> Low level local community involvement in planning natural resources and policy development. Little consideration of the livelihoods of local people in environmental policies. 	<ul style="list-style-type: none"> Promote community-based planning model over management of natural resources. Promote sustainable livelihood approaches in the management of natural resources including the establishment of nature reserves. 	<ul style="list-style-type: none"> At least fifteen communities have the power and effectively involved in planning of five nature reserves, five rangelands, and five fishery sites. 	EPA, GDFCD, AREA, MFW, Targeted local communities	\$ 150,000	Four years
		<ul style="list-style-type: none"> At least fifteen community-based management plans implemented in nature reserves, rangelands, and fishery resources. 	EPA, Targeted local communities	\$ 150,000	Four years
		<ul style="list-style-type: none"> Livelihoods programs for the support of local people developed and implemented in five important nature reserves, five rangelands and five fishery areas. 	EPA, GDFCD, AREA, MFW, Targeted local communities	\$ 100,000	Two years



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 1.4: Strengthening resource mobilization capacity of MEAs focal points through enhanced awareness, information base, and capacity building</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Limited capacity in developing strategies action plans and programs. ▪ Lack of reliable information under fragmented techniques and management systems. ▪ Inaccessibility of internet by developer of policy. ▪ Lack of GIS in most of environmental agencies. ▪ Lack of both hardware and Software facilities. ▪ Limited expertise and capacities of available staff. ▪ Weak national capacity to mobilize resources from international agencies. ▪ Weak Scientific and Technical Cooperation as well as exchange of information in environmental Issues. ▪ Limited staff and expertise on UN Conventions. ▪ Lack of specialized projects in range development. 	<ul style="list-style-type: none"> ▪ Raise awareness of public and policy makers on conventions and funding mechanism of MEAs conventions. ▪ Establish national information center(NEIC) under EPA umbrella. ▪ Provide the NEIC & MEAs focal points with the required hardware and software facilities to establish networks for information sharing between line institutions and international agencies. ▪ Implement training programs to improve capacity of policy makers in developing environmental strategies and plans. ▪ Provide training to staff of EPA & GDCFDC in report writing and information gathering related to MEAs conventions. ▪ Establish remote sensing systems and database/GIS systems for application in natural resources research and planning. ▪ Prepare training programs for (NEIC) staff and the units located at the governorate level. ▪ Provide training on resource mobilization from various international donation sources. ▪ Provide training to improve negotiation skills of policy makers. ▪ Train Environmental staff on planning and Project formulations. ▪ Provide financial and technical support to community environmental action, including the livelihoods of local communities. ▪ Secure adequate funds from government and donors to implement community action plans and programmes. 	<ul style="list-style-type: none"> ▪ Adequate resources for meeting MEAs commitments mobilized from funding mechanisms. ▪ Awareness on MEAs conventions and funding mechanism increased among policy makers. ▪ National Environment Information Center (NEIC) established under EPA umbrella. ▪ NEIC database established accessible by public and data end-users. ▪ Adequate number of senior staff from EPA & GDCFDC trained on developing environmental strategies and action plans. ▪ Policy makers fully involved in the planning listed under outputs 1.1. ▪ Training to staff of EPA & GDCFDC in report writing and information gathering related to MEAs conventions provided. ▪ Training programs for (NEIC) staff and the units located at the governorate level prepared. ▪ Remote sensing systems and database/GIS systems for application in natural resources research and planning established. ▪ Funds for rehabilitation programs of degraded wet lands secured. ▪ Training to improve negotiation skills of policy makers provided. ▪ Fund secured for implementation of sustainable livelihood approaches in the management of natural resources. ▪ Adequate funds for implementing monitoring and conservation plan of coastal and marine resources provided. ▪ Rehabilitation plans of degraded natural habitats executed. 	EPA, GDFCD, MPIC	\$ 100,000	Three years
			EPA, GDFCD, MPIC	\$ 50,000	Two years
			EPA, GDFCD, MPIC, MWE	\$ 150,000	Three years
			EPA, GDFCD, MPIC	\$ 50,000	Three years
			EPA, GDFCD	\$ 25,000	Three years
			EPA, GDFCD, MPIC, MSRA, MFW	\$ 75,000	Two years
			EPA, GDFCD	\$ 30,000	Three years
			All Environmental Agencies	\$ 50,000	Three years
			EPA, GDFCD, MPIC	\$ 150,000	Three years
			EPA, MWE, MFW, MPIC, MSRA,	\$ 100,000	Three years
			EPA, MWE, GDFCD, AREA, MFW, MSRA	\$ 100,000	Two years
			EPA, MWE, GDFCD, AREA, MFW, MSRA, MPIC, WRA, MAI, MEE	\$ 300,000	Three years
EPA, MPIC, MWE, MSRA, MFW	---	Three years			
EPA, MWE, GDFCD, AREA, MFW, MSRA, MPIC, WRA, MEE, MAI	---	Three years			



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
Strategic objective 2: Rationalization of legislative and regulatory frameworks for effective environmental protection					
Output 2.1: Streamlining internal structures of environmental agencies Baseline: <ul style="list-style-type: none"> ▪ Unclear and duplicated mandates and roles of environmental agencies. ▪ Absence or incomplete organizational structure and job descriptions of some environmental agencies. ▪ Weak coordination among administrative units in EPA (Climate Unit and Biodiversity Unit). ▪ Inadequate mechanisms for laws enforcement. ▪ Absence of by-laws/internal operation system. ▪ None existence of specialized body for monitoring introduction and control of invasive alien species. 	<ul style="list-style-type: none"> ▪ Review and harmonize mandates relevant agencies (EPA, GDFCD). ▪ Review and amend organization structure job description relevant agencies (EPA & GDFCD). ▪ Prepare by-laws/internal operation system. 	<ul style="list-style-type: none"> ▪ Government mandates and roles of environmental sector harmonized. 	EPA, GDFCD, WRA, MAI	\$ 100,000	Two years
		<ul style="list-style-type: none"> ▪ Updated organizational structures and job descriptions of EPA, GDFCD, Meteorological Department, & MAI approved by government. 	EPA, GDFCD, CAMA, MAI	\$ 30,000	Two years
		<ul style="list-style-type: none"> ▪ Internal working relations of MEAs focal points clearly defined and functioning. 	EPA, GDFCD, CAMA, MAI	\$ 10,000	Two years
		<ul style="list-style-type: none"> ▪ Specialized unit to monitor introduction and spread of invasive alien species established and implemented at MSRA. 	EPA, GDFCD, MSRA	\$ 100,000	Three years



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 2.2: Strengthening environmental management through integrated and participatory management of natural resources at central and local level.</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Lack of Partnerships with private sector & NGOs. ▪ Low level of local community involvement in the management of environment. ▪ Weak inter-institutional coordination and collaboration among environmental partners. 	<ul style="list-style-type: none"> ▪ Promote participation of local authorities, community-based groups and private sector in environmental management. ▪ Create appropriate coordination bodies for management and use of natural resources. ▪ Prepare by laws for smooth functioning of the coordination committees. ▪ Create inter-village coordination and participation mechanism for addressing common interests. ▪ Create environmental NGOs at local and central levels to act as advocacy groups to support environment protection. ▪ Activate private community involvement in environmental management through enforcement of contractual and concession policies, particularly with regard to energy productions, pollution and waste mitigation, and EIA enforcement. 	<ul style="list-style-type: none"> ▪ A cross-sectoral mechanism for integrated water management established and implemented. 	WRA, MWE	\$ 20,000	Two years
		<ul style="list-style-type: none"> ▪ A mechanism for coordinating land use is in place. 	GDFCD, MAI, AREA	\$ 20,000	Two years
		<ul style="list-style-type: none"> ▪ A mechanism for monitoring the deterioration of land resources established under AREA. 	EPA	\$ 20,000	Three years
		<ul style="list-style-type: none"> ▪ A coordination mechanism for biodiversity management implemented at EPA. 	EPA	\$ 20,000	Two years
		<ul style="list-style-type: none"> ▪ Number of sites community-based coordination mechanism created for wetlands management/use. 	EPA	\$ 10,000	Two years
		<ul style="list-style-type: none"> ▪ A management unit for control of invasive species created at EPA. 	EPA, AREA	\$ 50,000	Two years
		<ul style="list-style-type: none"> ▪ Establishment decrees for each coordination mechanism declared and enforced. 	EPA, NWRA, GDFCD, MAI, AREA	---	One year
		<ul style="list-style-type: none"> ▪ Number of decentralized management models of nature reserves created and implemented at district levels. 	EPA, GDFCD	\$ 150,000	Two years



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 2.3: Strengthening manpower performance through systematic capacity building and motivation</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Limited human resources, low level salary scale, unfavorable terms and conditions of public service. ▪ Unfair criteria and benchmarks for staff appraisal and promotions. ▪ Lack employment policy. ▪ High rate of brain drain. ▪ Improper internal communication system. ▪ Ineffective internal monitoring systems for staff presence or performance. ▪ Weak delegation of authority. 	<ul style="list-style-type: none"> ▪ Gap assessment of manpower. ▪ Establish national data base for human resources. ▪ Training needs assessment. ▪ Prepare human development strategy and recruitment plans to fill the gaps. ▪ Implement capacity building programs. ▪ Provide adequate financial and material resources for MEAs focal points. ▪ Establish staff performance and control/appraisal system for the public administration. ▪ Enforce fair and competitive salary scale. ▪ Develop employment policy. ▪ Enhance internal communication and networking. ▪ Establish internal monitoring systems for staff presence or performance. 	<ul style="list-style-type: none"> ▪ Two database systems for human resources are implemented at EPA & GDFCD. 	EPA, GDFCD, MAI, Research centers.	\$ 50,000	Three years
		<ul style="list-style-type: none"> ▪ Human development strategies formulated and executed by MEAs focal points. 	EPA, GDFCD, MAI, MWE, MCS, Research centers	\$ 60,000	Three years
		<ul style="list-style-type: none"> ▪ Performance and control appraisal system for the public administration. 	MCS, MWE	\$ 100,000	Three years
		<ul style="list-style-type: none"> ▪ New fair salary scale adopted by the government. 	MCS, MWE		



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 2.4: Strengthening law enforcement through updating and harmonization environmental laws</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Lack of coordination mechanisms among different authorities responsible for law enforcement. ▪ Outdated laws and inadequate law enforcement ▪ Inadequate legal frameworks local community involvement in the management of natural resources. ▪ Low Environmental awareness among decision makers and implementers of laws. 	<ul style="list-style-type: none"> ▪ Establish an effective coordination mechanism for revival, integration and enforcement of environmental laws. ▪ Review and identify duplication and gaps of environmental laws. ▪ Update and harmonize laws. ▪ Institutionalize the promotion of community-based planning model in the management of natural resources nationwide. ▪ Enact Local council law No. 4 by creating effective local management structures of natural resources. 	<ul style="list-style-type: none"> ▪ An effective mechanism for water law enforcement established and implemented under NWRA umbrella. ▪ Mechanism for monitoring violation of fishing laws established and implemented under Ministry of Fish Wealth. ▪ Forestry and combating desertification laws passed by government. ▪ Bylaws of forest laws approved and enforce. ▪ Legislations and for control of alien invasive species passed and enforced. ▪ Bylaw regulating fishing and use of proper fishing gears developed and enforced. ▪ At least ten community-based management structures created and implemented in protected areas management, rangelands, and fishery. ▪ Legal frameworks for community participation in the development and use of range resources established and implemented in at least in five rangelands, five fisheries and five protected areas. 	<p>NWRA, MWE</p> <p>MFW</p> <p>GDFCD</p> <p>GDFCD</p> <p>EPA</p> <p>MFW</p> <p>GDFCD, MFW</p> <p>EPA, GDFCD</p>	<p>\$ 15,000</p> <p>\$ 100,000</p> <p>\$ 30,000</p> <p>\$ 20,000</p> <p>\$ 10,000</p> <p>\$ 10,000</p> <p>\$ 100,000</p> <p>\$ 100,000</p>	<p>Two years</p> <p>Two years</p> <p>One year</p> <p>One year</p> <p>Two years</p> <p>One year</p> <p>Two years</p> <p>Two years</p>



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<i>Strategic objective 3: Streamlining research effort to improve understanding of the natural resources capacity to deliver goods & services and support livelihoods of Yemeni people sustainably</i>					
<p>Output 3.1: Stimulate integrated research on natural resource.</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Limited researches on, rare and endangered species. ▪ Lack of research on critical habitats. ▪ Poor information on environmental status. ▪ Outdated surveys on Natural resources(forest, ranges, soil, and desertification land). ▪ Inadequate assessment studies on degradation of NR. 	<ul style="list-style-type: none"> ▪ Experts committee for coordinating integrated research. ▪ Initiate researches on rare and endangered species and their habitats (EPA). ▪ Research on critical habitats, including methods to restore and maintain the ecological functioning of biodiversity components (EPA). ▪ Undertake stock assessment studies for the living marine resources. ▪ Initiate research to quantify and forecast the response of genotypes, species, habitats, ecosystems and landscapes under anticipated climate change. ▪ Develop methodologies for adaptation and conservation policies. ▪ Develop flora, fauna, and marine inventories. ▪ Provide funds and infrastructure for research institutions to develop research programs in the target areas. ▪ Conduct forest, range, soil and desertification surveys. ▪ Support traditional and environmentally sound land use practices. 	<ul style="list-style-type: none"> ▪ Experts committee for coordinating integrated research established. ▪ Researches on rare and endangered species and their habitats (EPA) conducted. ▪ Research to quantify and forecast the response of genotypes, species, habitats, ecosystems and landscapes under anticipated climate change conducted. ▪ Flora, fauna, and marine inventories developed. ▪ Forest, range, soil and desertification surveys conducted. ▪ Funds and infrastructure for research institutions to develop research programs in the target areas provided. ▪ Comprehensives database on land, flora and fauna, alien invasive, coastal/marine habitats, and conservation needs developed and accessible. ▪ A gene bank for seed conservation developed and implemented in AREA. ▪ Reliable methodologies for adaptation and conservation policies formulated and widely applied. ▪ Best traditional knowledge on herding practices and rotational use of ranges documented and applied. 	EPA, GDFCD, AREA, MSRA, Research centers, Sana'a & Aden universities	\$ 20,000	Two years
			EPA, GDFCD, AREA, MSRA, Research centers, Sana'a & Aden universities	\$ 50,000	Three years
			EPA, GDFCD, AREA	\$ 100,000	Three years
			EPA, GDFCD, AREA, MSRA	\$ 50,000	Three years
			EPA, GDFCD, AREA, MAI, MWE	\$ 100,000	Three years
			EPA, MPIC, MAI	\$ 100,000	One year
			EPA, AREA, GDFCD, MSRA	\$ 100,000	Three years
			AREA, GRC (University of Sana'a)	\$ 50,000	Three years
			GDFCD, AREA	\$ 50,000	Three years
GDFCD, AREA	\$ 20,000	Two years			



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 3.2: Promoting the transfer and application of science and technology in the management of natural resources, and monitoring of causes and consequences of man-hazards and natural disasters on natural resources.</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Lack of infrastructure for environmental monitoring and diagnosis. ▪ Low financial capacity to access and transfer technologies like early warning systems for weather prediction and modeling, and draught and flood monitoring... etc. ▪ Inadequate representatives of observation networks for monitoring environmental parameters and variables. ▪ Lack of network between research institutions. ▪ Lack of GIS in most of research institution. ▪ Inadequate financial support for environmental research. ▪ Inadequate adaptation and vulnerable assessment studies. ▪ Inadequate information on climate scenarios, emissions and climate predictions and modeling. ▪ Inadequate studies renewable and alternative energy, climate molding, climate scenarios and projection of GHG emissions. ▪ Low capacity of research scientists. ▪ Limited dissemination of research findings. ▪ Retardation traditional knowledge, innovation and good practices in environmental management. 	<ul style="list-style-type: none"> ▪ Promote satellite based for monitoring natural resources, including monitoring extreme weather events such as and drought cyclones, and floods rains... etc. ▪ Develop adequate networks for observation and monitoring of environmental variation. ▪ Revive and apply traditional knowledge, innovation and good practices in environmental management. ▪ Promote research on renewable and alternative energy. ▪ Develop capacity in weather monitoring and predictions of extreme weather events. ▪ Provide national experts with specialized training on: biodiversity assessment, climate modeling... etc. ▪ Provide training on GIS systems and networking (EPA, NEIC, GDFCD, AREA, MEE, MSRA, NAWRA & CAMA). ▪ Provide funds to EPA, NEIC, GDFCD, AREA, MEE, MSRA, and NAWRA & CAMA to develop research programs in the above target areas. ▪ Provide training on climate molding, climate scenarios and projection of GHG emissions. 	<ul style="list-style-type: none"> ▪ An early warning satellite-based system for monitoring flood and extreme weather events installed and implemented in CAMA. ▪ Adequate and representative hydro meteorological networks for monitoring weather variable established in CAMA & NWRA. ▪ Capacity in weather monitoring and predictions of extreme weather events developed. ▪ Training on climate molding, climate scenarios and projection of GHG emissions provided. ▪ National experts with specialized training on: biodiversity assessment, climate modeling... etc. provided. ▪ Stat of arts and new techs on rational water uses for irrigation, households, and industry transferred and applied. ▪ Adequate funds for research centers functioning secured by donor and government. ▪ Traditional knowledge, innovation, and good practices documented and applied in the management and use of, rangelands, forest, wetlands, coastal lands, fisheries and water resources. ▪ A satellite based system for monitoring land slides, change in land area and forest installed and implemented in AREA & NEIC. 	EPA, GDFCD, AREA, NWRA, MSRA	\$ 300,000	Three years
			EPA, CAMA, MEE, Research centers	\$ 120,000	Three years
			EPA, CAMA, MEE, Research centers	\$ 150,000	Three years
			EPA, CAMA, MEE, Research centers	\$ 50,000	Three years
			EPA	\$ 50,000	Four years
			EPA, GDFCD, AREA, MAI, MWE	\$ 30,000	Three years
			EPA, GDFCD, AREA, MSRA, NWRA	\$ 100,000	Three years
			EPA, GDFCD, AREA, MSRA	\$ 50,000	Two years
			EPA, GDFCD, AREA, MSRA, CAMA, Civil Defense, EQPC	\$ 50,000	Three years



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 3.3: Strengthening information base and free flow environmental information.</p> <p>Baseline:</p> <ul style="list-style-type: none"> Weak capacities and infrastructure in institutions engaged in the preparation of awareness and communication programs. Weak communication channels between EPA and the media in the preparation of environmental communication materials. Limited material resources and low qualified staff in environmental extension and communication. Lack of environmental specialist working for media. Notable absence of green press. 	<ul style="list-style-type: none"> Conduct needs assessment study for improving data collection processing, retrieval and dissemination. Establish information systems, including networks, application and expansion of GIS systems (EPA, GDFCD, AREA, MEE, MSRA, NWRA & CAMA). Formulate ICT development strategy for MEAs focal points and research institutions. Establish environmental communication units in relevant environmental agencies. Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information. Train staff of media and communication units on data acquisition, processing and production and dissemination of awareness materials. Carryout inventories of environmental, resource and development data for determining gaps and organizing activities to fill those gaps. Develop and assessment framework. Establish systems to verify quality of data gathered, i.e., a source check. Establish procedures for measurement and evaluation. Organize continuous and accurate data-collection systems, making use of GIS, databases, expert systems, models, and the like. 	<ul style="list-style-type: none"> Five database systems, including GIS systems established in research centers & EPA. Website established at EPA and linked to all research centers. ICT development strategy formulated for Focal points and research centers. Four environmental communication units established at EPA, GDFCD, AREA, NWRA, and MSRA. Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information. Train staff of media and communication units on data acquisition, processing and production and dissemination of awareness materials. 	EPA, GDFCD, AREA, MSRA, NWRA	\$ 100,000	Three years
			EPA, GDFCD, AREA, MSRA, NWRA	\$ 40,000	Three years
			EPA, GDFCD, AREA, NWRA, MSRA	\$ 20,000	One year
			EPA, GDFCD, AREA, NWRA, MSRA, MOI	\$ 200,000	Three years
			EPA, GDFCD, AREA, NWRA, MSRA	\$ 100,000	Three years
EPA, GDFCD, AREA, NWRA, MSRA	\$ 50,000	Three years			



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
Strategic objective 4: Rising environmental awareness of Yemeni society by integrating environmental themes in university and school curricula, promoting green media, and launching nationwide public awareness campaigns.					
<p>Output 4.1: Raising environmental awareness through a nationwide public campaigns, and national Programmes for integrating environment themes into national educational curricula at all education levels.</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Weak public awareness on environmental issues. ▪ Limited participation of local communities and NGOs in environmental related initiatives. ▪ Environmental protection themes are not integrated into school and university curricula. ▪ Low level of environmental awareness among youth. ▪ In adequate youth and school clubs. ▪ Notable shortage of trained manpower, specially of environmental educator and facilitators. ▪ Notable absence of green press, and eco-industry. 	<ul style="list-style-type: none"> ▪ Prepare national awareness strategy on values, importance and maintenance of major environmental assets. ▪ Promote environmental public awareness campaign through TV and radio mass media, community workshops, fact sheets and brochures production, electronic information and other communication materials. ▪ Expand establishment of green media and NGOs to act as advocacy groups for the protection of nature and the environment. ▪ Promote and facilitate community awareness and involvement in protection of environment. ▪ Assess capacity needs for incorporating environmental themes into schools and universities curricula. ▪ Develop programmes for integrating environment themes into educational curricula at all education levels. ▪ Integrate green themes into the education curricula of schools and universities. ▪ Develop training programs for teachers, to enable them developing and teaching environment themes. ▪ Establishment of youth green clubs in schools in all governorates. 	<ul style="list-style-type: none"> ▪ A national awareness strategy targeting various audience and environmental themes developed and implemented. ▪ Several message-driven awareness programs publicly launched. ▪ Several message-driven (on rangelands, forest and wetlands, and biodiversity) extension programs executed in rural areas. ▪ A national programme on best environmental practices and traditional knowledge implemented. ▪ Capacity building programs for local community, media men, teachers, researchers, educators, and extension officers provided. ▪ More green media established. ▪ Environmental topics integrated into schools and universities curricula. ▪ Schools and universities instructors adequately trained on teaching environmental topics. ▪ Community awareness and involvement in protection of environment enhanced. ▪ Environmental clubs replicated in major schools across all governorates. 	<p>EPA, MOE, Sana'a & Aden universities, MOI</p> <p>EPA, MOE, Sana'a & Aden universities, Research centers, MOI</p> <p>EPA, GDFCD, AREA, MSRA, NWRA</p> <p>EPA, MOE, Sana'a & Aden universities</p> <p>EPA, Research centers</p> <p>EPA, MOE, Sana'a & Aden universities</p> <p>EPA, MOE, Sana'a & Aden universities, Research centers</p> <p>EPA, MOE, Sana'a & Aden universities</p> <p>EPA</p> <p>EPA, MOE</p>	<p>\$ 10,000</p> <p>\$ 200,000</p> <p>\$ 100,000</p> <p>\$ 50,000</p> <p>\$ 200,000</p> <p>\$ 50,000</p> <p>\$ 120,000</p> <p>\$ 100,000</p> <p>\$ 100,000</p> <p>\$ 150,000</p>	<p>Two years</p> <p>Two years</p> <p>Two years</p> <p>Two years</p> <p>Two years</p> <p>Three years</p> <p>Two years</p> <p>Three years</p> <p>Two years</p> <p>Three years</p>



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
Strategic objective 5: Promote the conservation & sustainable use of natural resources					
Output 5.1: Promoting sustainable land use management plans and practices Baseline: <ul style="list-style-type: none"> ▪ Desertification, soil erosion and sand dune movement. ▪ Degradation of terraces and rangelands. ▪ Outdated National Action Plan for Desertification Control (NAPDC). ▪ Recession of traditional systems on land use. ▪ Improper application and use of pesticides. ▪ Improper use of agro-chemicals (pesticides, fertilizers, fruit ripening agents, etc.). ▪ Increased woodcutting and overgrazing. 	<ul style="list-style-type: none"> ▪ Mobilize resources for updating the NAPCD (GDFCD). ▪ Asses desertification processes based on mapping and survey of sand dunes and degradation in decertified rangelands; surveying and mapping of decertified lands; strengthening computerized geographical information systems for use in assessing and monitoring desertification (MAI, GDFCD & AREA). ▪ Promote public participation in land management(MAI, GDFCD & AREA). ▪ Harmonize GDFCD mandates (MCS, GDFCD, EPA, MAI and MWE). ▪ Develop meteorological and hydrological networks, and improve climatologically data base; research and assessment of climate aspects of desertification, including droughts (GDFCD, CAMA & AREA). ▪ Establish a early warning systems for drought preparedness, and for combating desertification (CAMA, GDFCD, NWRA, AREA, MAI & MWE). ▪ Continue operation and extension of network of integrated research, training and demonstration pilot projects in arid lands (GDFCD & AREA). ▪ Revival and application of traditional systems terraces and rangelands conservation and in water sheds (GDFCD, AREA, & MAI). ▪ Mobilize resources for demonstration and application of appropriate methods for reducing wind and rainfall erosion, stabilize dunes, surface-water harvesting and ground-water; assessment, development and management of ground-water resources in critically decertified areas (GDFCD, CAMA & AREA, MAI, & NWRA). ▪ Mobilize resources for initiation and management of pilot projects for integrated village development and grazing-lands rehabilitation (GDFCD, AREA, & MAI). ▪ Promoting the use of natural fertilizer e in replacement of imported agrochemicals (GDFCD, AREA, & MAI). ▪ Promoting the integrated pest management techniques (GDFCD, AREA, & MAI). ▪ Implement Programmes, involving afforestation, agroforestry, terraces rehabilitation, dune and wadi bank stabilization, shelters belts, greenbelts and windbreaks, and watershed management and protection(ministry of finance, ministry of planning, GDFCD, NWRA, AREA, MAI & MWE). 	<ul style="list-style-type: none"> ▪ Number of traditional systems applied in terraces, rangelands water sheds management. ▪ NAPDC updated & implemented. ▪ Green rings built in four main cities, and number of wind shelters established in at least four critically deforested areas. ▪ Integrated pest management techniques widely farms management. ▪ Quantity of natural fertilizer use increased and level of agrochemical fertilizer import reduced. ▪ Number of pilot projects on terrace rehabilitations, desertification, and of rangeland conservation implemented. ▪ Rangelands development center implemented in forestry department. 	GDFCD, MAI, AREA GDFCD, MAI, AREA GDFCD, MAI, AREA MAI, AREA GDFCD, MAI, AREA GDFCD, MAI, AREA GDFCD, AREA	\$ 20,000 \$ 200,000 \$ 300,000 \$ 50,000 \$ 50,000 \$ 100,000 \$ 100,000	Three years Three years Five years Three years Three years Three years



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 5.2: Strengthening Ex-situ & in-situ conservation Capacities.</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Absence of recovery and rehabilitation plan for threatened species. ▪ Lack of guidelines for collection, maintenance and reintroduction of plants and animal species in ex-situ programmes. ▪ Absence of plant and animal gardens to conserve rare and endangered species. ▪ Lack of National Museum for natural history related to biological diversity in Yemen. ▪ Lack of genetic resources centers. ▪ Limited trained staff in out-situ conservation. 	<ul style="list-style-type: none"> ▪ Formulate a national policies for the protection of flora, fauna and their habitats. ▪ Promotion of the conservation and development of protected areas through the formulation and implementation of management plans. ▪ Establishment & maintenance of data bases on plants, animals and protected areas. ▪ Assessment of the status and trends of wildlife and habitat conservation. ▪ Identify, map, & prioritize areas of threatened endemic species. ▪ Develop guidelines for collection, maintenance and reintroduction of plants and animal species in ex-situ programmes. ▪ Adopt measures to prevent unsustainable harvesting. ▪ Research and surveys on endangered flora & fauna. ▪ Prepare and implement recovery and rehabilitation plan for threatened plant and animal species. ▪ Assessment and management of ex <i>situ</i> crop and fodder plant genetic resources. ▪ Development and strengthening capacity for <i>ex-situ</i> conservation through the establishment of gene banks, seed banks, national herbarium, natural history museum and public gardens. ▪ Formulation of relevant instruments to govern accessibility to crop plant genetic resources. ▪ Support for <i>in situ</i> conservation of plants species in selected nature reserves. ▪ Set up and conducting training programs in out-situ conservation. 	<ul style="list-style-type: none"> ▪ Yemen red list of endanger species published. ▪ Recovery and rehabilitation plans prepared and implemented. ▪ Number of gene banks, seed banks, and public gardens museums established. ▪ A comprehensive national ex situ and in situ genetic conservation system established and operational. ▪ The national herbarium & natural history museum established. ▪ Guidelines on collection, maintenance and reintroduction of plants and animal species developed and used. ▪ Instruments to govern accessibility to crop plant genetic resources formulated. ▪ Data bases on plants, animals and protected areas established. ▪ The status and trends of wildlife and habitat conservation assessed. ▪ Assessment and management of ex <i>situ</i> crop and fodder plant genetic resources are conducted. ▪ Identifying, mapping, & prioritizing areas of threatened endemic species are conducted. ▪ Professionals trained for conservation and management of biodiversity. 	EPA, GDFCD, AREA, MAI	\$ 20,000	Three years
			EPA, GDFCD, AREA	\$ 120,000	Two years
			EPA, AREA, GDFCD	\$ 200,000	Three years
			EPA	\$ 50,000	Three years
			EPA	\$ 100,000	Seven years
			EPA, AREA, GDFCD	\$ 10,000	Three years
			EPA	\$ 10,000	Three years
			EPA, GDFCD, AREA	\$ 50,000	Three years
			EPA	\$ 40,000	Three years
			EPA	\$ 50,000	Three years
EPA, GDFCD, AREA	\$ 50,000	Three years			
EPA	\$ 100,000	Five years			



Final Report and Action Plan for Environmental Capacity Development

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
<p>Output 5.3: Strengthening institutional capacity of the National Committee for Biotechnology and Biosafety.</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Poor knowledge & database of biotechnology, biosafety, & genetically modified organisms. ▪ Lack of regulations on use and distribution of genetically modified organisms. ▪ Weak national skills in the field of modern bio-technology management. ▪ Lack of policies framework on Bio-technology and Biosafety. 	<ul style="list-style-type: none"> ▪ Prepare and apply national policy for biotechnology and Biosafety. ▪ Assess options for the safe transfers & use biotechnologies. ▪ Establish data base for Biotechnology and Biosafety and activate information exchange programme. ▪ Control and manage the side effects of using the genetically modified organisms. ▪ Strengthen the capacity of organizations in the field of Biotechnology and Biosafety through establishing specialized laboratories and train the local staff. 	<ul style="list-style-type: none"> ▪ A national biotechnology policy and biosafety frameworks prepared and enforced. 	EPA	\$ 10,000	Two years
		<ul style="list-style-type: none"> ▪ Stock-taking on the safe use of biotechnologies published. 	EPA	\$ 100,000	Two years
		<ul style="list-style-type: none"> ▪ Laws on LMOs and Biotechnology prepared and enacted. 	EPA	\$ 20,000	Two years
		<ul style="list-style-type: none"> ▪ Staff of the National Committee for Biotechnology and Biosafety trained on LMOs and Biotechnology. 	EPA, Research centers	\$ 200,000	Three years
		<ul style="list-style-type: none"> ▪ A National Biosafety Database established and publicly accessible. 	EPA, Research centers	\$ 50,000	Three years
		<ul style="list-style-type: none"> ▪ Number of genetically engineered species safely introduced and controlled. 	EPA, Research centers	\$ 100,000	Three years



Specific Climate change Issues

Expected Outputs	Planned Actions	Indicators	Responsibility & Collaborators	Budget	Time Frame
Strategic objective 6: To mitigate the adverse impacts of GHG emissions..					
<p>Output 6.1: Strengthening Mitigation & Adaptations Capacity</p> <p>Baseline:</p> <ul style="list-style-type: none"> ▪ Absence of an institutional structure aimed at integrating climate change issues into national plans. ▪ Extensive use of high carbon content fuels use. ▪ Weak enforcement of existing standards for air-pollution control. ▪ Lack of national mitigation and adaptation plans for climate change. ▪ Limited knowledge on climate change, biodiversity issues, & friendly technologies. ▪ Lack of human resources to address climate issues. ▪ Weak recognition of the climate change issue relative to other development priorities. 	<ul style="list-style-type: none"> ▪ Establishment of a joint mechanism for CDM development consisting of MWE, MOE, MOC, MPIC, MAI, MITC, and other concerned & public and private, along with academic and research institutes. ▪ Strengthening the climate change unit (CCU) to effectively handle climate change issues. ▪ Develop and implement a National Mitigation Plans (NMP) for reducing greenhouse gases emissions from energy sectors. ▪ Promote adoption of clean technologies by small and medium industries. ▪ Develop and implement a Policy framework & a National Adaptation Programme of Action (NAPA) to adapt to climate change. ▪ Enhance information base through creating & maintaining a national climate change web page with links to national, regional and international sources of information. ▪ Create a database on clean technologies, and promote dissemination of new technologies developed both in Yemen and abroad. ▪ Promote climate change and technology research with focus on climate profiles & modeling, development of GHG inventories and emission scenarios, & vulnerability and adaptation assessment for vulnerable sectors. ▪ Increase awareness of decision makers and encourage/support research community. ▪ Provide training to new GHG inventory experts & university students for each GHG inventory category. ▪ Building capacity in developing & appraising clean technology switchover project proposals. 	<ul style="list-style-type: none"> ▪ A report on options to mitigate GHG emissions from energy sector published. ▪ A mechanism for development, adaptation and evaluation of clean technologies is in place & functioning. ▪ Capacity of CCU adequately strengthened to handle climate change issues. ▪ A National Mitigation Plans (NMP) for reducing greenhouse gases emissions from energy sector developed and implemented. ▪ A National Adaptation Program of Action (NAPA) approved & implemented. ▪ Clean technologies promoted by public sector and small and medium industry. ▪ A policy framework & a National Adaptation Programme of Action (NAPA) to adapt to climate change developed & implemented. ▪ Training for national staff for GHG inventories & clean technology are provided. ▪ A national climate change web page established and accessible. ▪ A database on climate change & clean technologies developed & implemented at EPA. 	EPA, MEE, MITC	\$ 20,000	Two years
			EPA, MAI, MWE, MOE, MITC, Research centers	\$ 50,000	Two years
			EPA	\$ 300,000	Two years
			EPA, MEE, MAI, MWE, GDFCD, Research centers	\$ 100,000	Two years
			EPA, MEE	\$ 50,000	Two years
			EPA, MEE, MAI, MWE, GDFCD, MFW, Research centers	\$ 100,000	Two years
			EPA, MEE	\$ 200,000	Three years
			EPA	\$ 50,000	Two years
			EPA	\$ 50,000	Two years

7.2 Annex (2): Thematic Assessment Issues\ Gaps Analysis:

7.2.1 Desertification Issues\ Gaps:

Planned Framework for Priority Analysis of Environmental Issues and Gaps to Control Desertification:

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
1. Land Degradation	<ul style="list-style-type: none"> • Degradation of agricultural terraces and watersheds. • Lack of polices and legislations on Land use. • Recession of traditional systems on land use. • High rates of population growth and random extension of urban settlements. • Ad-hoc use pesticides and fertilizers. • Wood removing and extensive grassing. • Limited research activities on land use planning. • Lack of rural development programs in the rain-fed areas. • Absence of prediction and monitoring systems and lack of information system on land degradation. 	<ul style="list-style-type: none"> • Modernize and enforce the National Action Plan on desertification control. • Enforce the Environmental Impact Assessment in Road and water reservoir projects to ensure incurrance of negative effects. • Develop the abilities of and re-organize the local communities to develop the traditional systems to conserve terraces and water sheds. • Improve population awareness in the rural societies. • Expand planning of the urban programs to include the high population concentration in rural areas to ensure the conservation of agricultural lands. • Enforce of pesticides and fertilizers law and encourage the introduction of alternative technology of IPM. • Introduce alternative energy sources (Sunlight Oven, Biological Gas, Modern ovens that works on butane). • Re-establish traditional systems in grazing management through involving local communities and through extensive extension programs. • Work with local communities for the rehabilitation of degraded grazing areas. • Develop a research programs to include rangeland and rainfed research as well as for land use planning techniques. • Strengthen the capacity of the Natural Resources Renewable Centre and expand it is activities to include the prediction and the monitoring. 	<p>Sys/Inst./Indi. Sys/Inst./Indi.</p> <p>System/Inst.</p> <p>Sys/Inst./Indi. Sys/Inst./Indi.</p> <p>Sys/Inst./Indi.</p> <p>Instit./ Individ.</p> <p>Sys/Inst./Indi.</p> <p>Institutional. Instit./ Individ.</p> <p>Instit./ Individ.</p>

Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
2. Plant Cover Degradation	<ul style="list-style-type: none"> • Lack of information system and inaccuracy of the available information. • Deterioration of traditional agricultural system and negligence of positive agricultural practices. • Limited research activities on plant cover. • Absence of laws and legislations which regulate plant cover use. • Lack of livelihood alternatives which reduce the pressure on plant cover use. • Extensive exploitation of groundwater for cash crops cultivation. • Lack of programs for economical use of plant cover resources. 	<ul style="list-style-type: none"> • Carry out field surveys on plant species taxonomy and conserve it is genetic sources. • Improve the capacities of the national teams in using modern methods for species taxonomy and genetic sources description. • Set a proper plan for monitoring and controlling invasive plant species. • Establish a unified data base/network system on the plant cover. • Define and document the traditional practices in sustainable and exploitation of plant species and reuse them. • Improve research programs and researchers capacity in plant species cover studies. • Issue the forestry law and its bylaw. • Set up development programs ensures creating income alternatives for local communities through credit programs to develop small projects. • Apply the water law and encourage wide use of modern irrigation methods. • Prepare economical evaluation studies on some plant use in medical industries and cosmetics. • Set programs and plans to conduct and manage the agro-pastoral systems as well as extending wind control and green belts in sand dunes and water erosion areas. 	<p>Instit./ Individ. Instit./ Individ.</p> <p>Sys/Inst./Indi. Instit./ Individ. Instit./ Individ.</p> <p>Instit./ Individ. Sys/Inst./Indi. Sys/Inst./Indi.</p> <p>Sys/Inst./Indi. Institutional.</p> <p>Instit./ Individ.</p>
3. Un Sustainable Water Management	<ul style="list-style-type: none"> • Deteriorating the traditional systems in watershed management. • In-efficiency in applying the rules and laws that organize grounds water. • Absence of educational and extension programs on water management and conservation. • Limited research programs on water resources issues and its efficient use. • Difficulties for transfer and compatibility of modern technologies in irrigation at on-farm level due to social and economical factors. • Dispersion of Responsibility for monitoring water movement on many authorities. • Lack of vision on the proper use of untraditional water resources. 	<ul style="list-style-type: none"> • Re-innovate the traditional systems and develop them to suit the existing challenges in watershed management with stakeholders direct participatory. • Establish regional branches for National Water Resources Authority covering the main water reserve grounds. • Set up awareness and educational plans and programs on water sustainable use & management. • Extend research programs on water management on farm level to increase water use efficiency. • Conduct Socio-Economic studies on water partnership systems to overcome the obstacles by introducing improved techniques in irrigation. • Evaluate water economics and determine the exact costs of water used in irrigation. • Strengthen the capacities of the National Water Resources Authority to enable it to observe and monitor changes in surface and underground water. • Conduct field and laboratory studies to determine the suitability of untraditional waters use for agriculture. 	<p>Sys/Inst./Indi.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>Institutional. Instit./ Individ.</p> <p>Instit./ Individ.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
4. Degradation of Natural Forests	<ul style="list-style-type: none"> • Lack of National program for integrated forest management and develop it accordance to ecological and economical benefits as well as the conservation of biological diversity. • Lack of organizational strength for GDFCD Headquarter as well as in the regional offices. • Absence of Forestry law and bylaw • Lack in technical abilities in Management, protection, counting, identification and evaluation of forestry resources as well as collecting and analyzing data. • Lack in research, education, extension and awareness activities at all levels. • Absence of gene bank to preserve and protect seeds in order to improve plant cover. • Lack of data base system that depends on GIS and remote sensing. • Limited use of traditional knowledge in natural forest. • Lack of coordination mechanism between agencies related to forestry Resources management. 	<ul style="list-style-type: none"> • Prepare national plan for integrating forest management and developing it according to ecological and economical benefits. • Strengthen the technical capacities of the GDFCD and its branches in the governorates. • Issues the forestry law and its bylaw. • Prepare research, education and awareness programs at all levels. • Strengthen the capacities of the Genetic Resources Centre and Genetic Resources Centre in Sana'a University, extend their activities to collect and preserve forest genetic resources. • Establish National Genetic Centre and extent its responsibility to cover the terrestrial, agricultural and marine resources. • Establish data base system GIS and remote sensing data. • Work with local communities to identify, collect and apply the traditional knowledge in forestry management. • Set up mechanism for effective partnership and coordination between stockholders and agencies related to Forest resources use and management. 	<p>Institutional.</p> <p>Instit./ Individ.</p> <p>Sys/Inst./Indi.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>System/ Institut</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>Sys/Inst./Indi.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Building	Intervention Level
5. Low Enforcement of Policies and Legislations Related to Natural Resources Conservation	<ul style="list-style-type: none"> • Shortage of financial resources specified for implementing policies and legislations. • Shortage of decision makers knowledge on policy and legislation enforcement. • Responsibilities dispersion and intervention of duties within different organization. 	<ul style="list-style-type: none"> • Allocate financial resources from local budget in order to implement policies and legislations related to Natural Resources conservation. • Organize donors meetings; involve different sectors (private sector, NGO's, International Organizations) to secure extra funds. • Set up awareness, training programs for the decision makers involved in enforcing laws and rules related to natural resources management. • Set up mechanism to ensure the involvement of specialized persons in enforcing laws and rules related to natural resources management. • Formulation of technical team to review the laws and rules produced in the past in order to over come any overlaps and interventions. 	<p>System/Inst./Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Institutional.</p> <p>Institutional.</p>
6. Weakness of Institutional Mechanisms that Define Responsibilities and Roles for the Different Sectors	<ul style="list-style-type: none"> • Weakness of coordination and cooperation between different organizations involved on desertification control. 	<ul style="list-style-type: none"> • Set up programs for implementation the role of secretariat of the National Committee and improving its ability. • Set up programs to strengthen the capacity of the GDFCD. 	<p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p>
7. Commitment Weakness of Different Parties in Implementing the Obligation Priorities of the National Plan	<ul style="list-style-type: none"> • Shortage of financial resources and dispersion within many parties. • Shortage of qualified personnel in the field of Forestry and Desertification Control. 	<ul style="list-style-type: none"> • Establish National Fund to Combat Desertification or any other alternative. • Allocate enough funds to conduct the National Plan. • Set up programs to recruit higher qualified personals. • Set up training programs to train the existing cadre. 	<p>System/Inst./Indiv.</p> <p>System/Inst./Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p>
8. Failure in Implementing the Contents of the National Plan, which are Obligatory Commitments of the Convention	<ul style="list-style-type: none"> • Weak coordination between agencies responsible for planning and funding the national plan programs. • The desertification problem is too big in comparison to the limited allocated resources • Weakness of the organizational structure of GDFCD. • Limited funding for conducting the National Plan to Combat Desertification. 	<ul style="list-style-type: none"> • Team Formulation to review the National Plan and its contents and implementing the coordination between planning parties and funding agencies. • Prepare Strategy Contains short, medium and long term effective programs. • Review the structure of the GDFCD and propose a suitable structure. • Organize a meeting the Donors to get Local and International fund resources. 	<p>Instit./ Indiv.</p> <p>System/Inst./Indiv.</p> <p>Instit./ Indiv.</p> <p>System/Institut.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Building	Intervention Level
9. Absence of Coordination between the Different concerned Bodies of the Three Conventions (Biodiversity, Desertification and Climate Change)	<ul style="list-style-type: none"> • Multiple responsibilities and duplication in conducting common articles in the conventions. 	<ul style="list-style-type: none"> • Produce coordination mechanism between the concerned agencies of the three conventions. • Shift the UNCCD focal points and GDFCD to the EPA, Ministry of Water & Environment to unified the focal points of the environmental conventions. 	Instit./ Indiv. System/ Institut.
10. Weakness in Cooperation and Coordination between Regional and Sub-regional Programs Related to Desertification Control	<ul style="list-style-type: none"> • Weakness in contact with regional and sub-regional countries due to low facilities. • Low awareness at all levels on the importance of regional programs in desertification control. • Absence of data base and information system at local and regional level. 	<ul style="list-style-type: none"> • Set up programs to improve the abilities of the national staff in order to be able to communicate and coordinate with equivalent organizations and personnel of the region. • Set up educational and awareness programs on the importance of Regional Programs to combat desertification on different medias. • Establishing Data base at local and regional levels. • Review the tasks of the GDFCD and strengthen it with qualified personnel able to observe and document the desertification phenomenon. 	Instit./ Indiv. Instit./ Indiv. Instit./ Indiv. Instit./ Indiv.
11. Weakness in the Capacities of Coordination and Communication with Working Networks of International Programs & Organizations	<ul style="list-style-type: none"> • Weakness of GDFCD in coordination and contacts. • Short sight on the importance of developing capacities in the field of coordination and communication. • Coordination Weakness between the concerned bodies (governmental, NGO's and International bodies) in the field of International Cooperation. 	<ul style="list-style-type: none"> • Set up plan to restructure GDFCD and review its responsibilities to ensure improvements in its capacity to contact all regional and international organizations. • Set up executive programs and plans for sustainable capacity development. • Set up a coordination mechanism between the different bodies in the field of international cooperation. 	Institutional. Instit./ Indiv. Institutional.



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Building	Intervention Level
<p>12. Weakness of Information National System in the Field of Natural Resources and Desertification Combating</p>	<ul style="list-style-type: none"> • Weakness in the constituents of the National Information System (Studies, monitoring networks, Information systems ...etc). • Weakness in the collection, documentation and exchange information. • Limited studies involve the rural women with the resources management result in executing them from programs and projects. 	<ul style="list-style-type: none"> • Set up programs to strengthen the national information system (Studies, monitoring networks, Information systems ...etc). • Set up effective mechanism for collecting, documenting and exchange of information as well as checking and revising them periodically. • Set up training programs and plans to develop the capacity of the national staff to enable them to deal with data bases. • Conduct socio-economic studies and evaluate the gender role in resource management. • Set up executive, qualification and awareness programs to ensure effective role for women in all programs and projects and involve her in the policies connected to desertification control. 	<p>System/Inst./Indiv.</p> <p>Institutional.</p> <p>Instit./ Indiv.</p> <p>System/Institut.</p> <p>System/Inst./Indiv.</p>
<p>13. Limited Research Programs in the field of Desertification Control as well as in Documenting and Enhancement Local Knowledge in the Sustainable Management of Resources and Desertification Control</p>	<ul style="list-style-type: none"> • Low attention of applied research to local issues causing desertification. • Disappearance of traditional knowledge and systems that relate to sustainable management of resources and desertification control. • Low awareness of decision makers and local funding structures about the importance of combating desertification and its impact. 	<ul style="list-style-type: none"> • Set up research programs which taking into account local issues relate to desertification and securing funds for these researches. • Conduct surveys for traditional knowledge, documenting, improving and publishing them to wide extent. • Put training programs for extension personal. • Conduct awareness and extension campaigns periodically for planes, local funding agencies staff and the public, especially women. 	<p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
<p>14. Limited Funds to conduct Programs and Activities of the National Action Plan</p>	<ul style="list-style-type: none"> • Organizational weakness in preparing satisfactory inventory projects to deal with the desertification control. • Weakness in directing available financial resources support and conduct the Programs and activities of the National Plan to combat desertification. 	<ul style="list-style-type: none"> • Set up training programs to strengthen the capacity of GDFCD. • Set up proper mechanism ensures straightness, and transparency in preparing and conducting programs which supported from local and international funds. • Propose real programs that direct financial resources to improve degraded areas as well as poverty alleviation. • Set up and conduct training programs in the field of budget preparation. 	<p>Instit./ Indiv. System/ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p>
<p>15. Shortage of Training and Educational Programs in the Field of Desertification Control, Especially in the Educational Curriculum either in Schools, Institutes or Universities</p>	<ul style="list-style-type: none"> • Lack of awareness of educational curriculum developers (for schools, institutes or universities) in desertification issues. • Absence of educational programs in desertification combating. • Disappearance of traditional knowledge and society role in combating desertification. 	<ul style="list-style-type: none"> • Set up and conduct training programs for educational curriculum developers/formulators in educational organizations on the importance of desertification control. • Set up and conduct training programs for teacher's and academic staff in the educational organizations. • Introduce practical environmental issues application in the educational curriculum. • Prepare and conduct awareness programs through different media. • Set up and conduct programs to collect and document traditional knowledge relate to environmental issues and desertification control. • Reproduce and revolve traditional knowledge relate to environmental issues and desertification control. • Involve traditional knowledge as part of the educational courses in schools and universities. 	<p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Individuals.</p>



Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
<p>16. Weakness of Transfer Mechanisms for Available Information Technologies by all Communication Means</p>	<ul style="list-style-type: none"> • Weakness in establishing knowledge contact channels at the regional and international levels in the field of technology use and transfer that relate on desertification. • Absence of stock list for the knowledge and technologies at the national and international levels. • Limitations in the general direction towards protection of customs and local traditional practices followed in natural resources management. 	<ul style="list-style-type: none"> • Inviting International experts to introduce other exercises practiced in other countries. • Arrange field visits for concerned people to know and learn new skills. • Activate the geographical information and remote sensing unit and strength the ability of GDFCD in desertification control. • Setting up a national program to conduct surveys, describe and documenting tradition knowledge and expertise that are used in desertification control. • Prepare and conduct awareness programs about the importance of protecting customs and traditional practices. • Issuing and implementing rules to encourage local societies and individuals to renew and revolving the customs that ensure the protection of environment and manage natural resources. • Setting up programs to support and strength the existing organizations to enable them in transferring and adopting technologies that are acceptable economically, socially and environmentally. 	<p>Instit./ Indiv.</p> <p>System/ Indiv. Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p> <p>Instit./ Indiv.</p>

7.2.2 Biodiversity Issues\ Gaps:

Planned Framework For Environmental Priority Analysis of Biodiversity:

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
1. Modernity of Protected Areas Management	<ul style="list-style-type: none"> • Lack of effective systems on protected areas management. • Limited areas under protection and weak their management plans. • Limited technical staff in protected areas management. • Weak enforcement of legal framework related to protected areas management. • Lack of tangible information on species and habitat of fauna and flora as well as Endemic and Endangered Species. • Weak in applying the laws related to the fauna and flora and habitats conservation. • Limited participation of local community. 	<ul style="list-style-type: none"> • Develop coordination mechanisms to improve integrated protected areas management. • Develop and expand wide network for protected areas. • Set plans to establish and manage protected areas due its environmental sensitivity. • Prepare data base on biodiversity components and protected areas. • Formulate and fund research proposals to improve the practices in protected areas conservation and management. • Ensure the availability of basic needs (Equipments, Transport systems, Communication toolsetc) necessary to enhance the protected areas conservation. • Set up training programs and workshops to improve the capability of the staff in protected areas sustainable management. • Organize and strengthen participation of the local communities in protected areas management. 	<p>System/Inst./ Indiv.</p> <p>System/ Inst. Instit./ Individ.</p> <p>Instit./ Individ. Instit./ Individ.</p> <p>Institutional.</p> <p>Instit./ Individ.</p> <p>Institutional.</p>
2. Degradation of Endemic and Endangered Species	<ul style="list-style-type: none"> • Lack of mentoring capacities on threatened and rare species. • Shortage of endemic species conservation mechanisms. • Weak of local community's observation on biodiversity components especially endangered species. • Shortage in information on endangered species/habitats situation and needs. • Degradation of natural habitats due to developmental activities. 	<ul style="list-style-type: none"> • Document available information on endangered species and establish data base. • Execute and perform bylaws to conserve endangered species. • Prepare the red list on the Rare and Endangered species in Yemen. • Design and conduct social programs to conserve endemic species especially those threatened to disappear in their natural home. • Prepare and implement plan to import and resettlement endangered species. • Improve the capability of agencies and staff to enable them to carryout monitoring and inventories on rare and endangered species. • Set up and execute a program to rehabilitate and manage endangered species. 	<p>Instit./Individ.</p> <p>System/ Inst./ Indiv. Instit./ Individ. Instit./ Individ.</p> <p>Instit./ Individ. Instit./ Individ.</p> <p>Instit./ Individ.</p>

Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
3. Weakness in Ex-Situ Conservation	<ul style="list-style-type: none"> • Shortage and limitation in the programs and activities of the Genetically Resources Centers. • Absence of Plant and Animal Gardens to conserve Rare and Endangered Species. • Lack of National Museum for natural history related to biological diversity in Yemen. • Limited trained staff in species ex-situ conservation. 	<ul style="list-style-type: none"> • Design and conduct national policy for ex-situ protection. • Completion and develop green belts and public gardens as well as historical museums. • Prepare extension guides to organize, conserve and reallocate plant and animal species. • Set up and conduct training programs in ex-situ conservation. 	<p>System/ Inst./ Indiv. Instit./ Individ.</p> <p>System/ Individ.</p> <p>Instit./ Individ.</p>
4. Spread of Alien Invasive Species	<ul style="list-style-type: none"> • Lack of enough information on numbers, species, composition and the effect of invasive alien species. • Weak organizational capacity to evaluate and manage the invasive alien species. • Lack of monitoring mechanism for the invasive alien species. • Lack of legislative frame work to control and organize the introduction of the invasive alien species. • Lack of curative and corrective measures to reduce the effect of invasive alien species on environment. 	<ul style="list-style-type: none"> • Establish data base for the invasive species and define the most dangerous ones. • Set up programs to monitor the spread of the invasive alien species. • Strengthen and enhance quarantine measures to control intended or unintended intrusion for introduced invasive alien species. • Prepare laws and bylaws to control invasive alien species imports and commercial use. • Establish specialized unit to monitor invasive alien species. • Set up training programs to improve the local staff capacity to monitor and evaluate the impact of invasive alien species. 	<p>Instit./ Individ. Instit./ Individ. Instit./ Individ.</p> <p>System/ Inst./ Indiv.</p> <p>Instit./ Individ. Instit./ Individ.</p>



Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
5. Degradation of Terrestrial Biodiversity	<ul style="list-style-type: none"> • Degradation and destruction of the natural habitat. • Desertification includes soil erosion and sand dune movement. • Agricultural expansion with bad practices. • Wood harvesting for fuel and coal as well as for construction. • Extensive grazing neglecting sustainable traditional practices. • Over-fishing and random hunting of wild animals. • Over exploitation and use of limited ground water. • Over using of pesticides and chemical fertilizers. • Low level of awareness on the importance of biological diversity conservation. • Shortage in the legislative system organizing the trade use and management of wild life. 	<ul style="list-style-type: none"> • Evaluate the precision of maps and habitats and plant cover data/information in their natural ecosystem. • Modernize the data base and the GIS on habitats and plant species. • Conduct surveys and researches on rangelands management methods and use and on its efficiency regular evaluation. • Prepare policies and programs to improve rangeland management. • Extend planting programs and desertification control. • Document the environmentally sound traditional practices and activate them to conserve the biodiversity. • Set up information and awareness programs to raise the knowledge on the importance of biological diversity conservation. • Conduct research and disseminate alternative technologies use of pesticides and chemical fertilizers in agriculture production. • Enforce the laws related to pesticides and fertilizers use. 	System/ Inst./ Individ. Instit./ Individ. System/ Individ. Institutional. Institutional. Institutional. Instit./ Individ. Instit./ Individ. System/ Individ.

Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
6. Degradation of Marine and Coastal Biodiversity	<ul style="list-style-type: none"> • Degradation of marine and coastal habitat reclamation of coastal areas, extensive mangroves grazing and cutting and due to ships waste land wastes disposal onto sea. • Over fishing and unsustainable management of marine resources. • Disappearance and reduction of some important marine species due to unorganized fishing. • Destruction of coral reefs and benthic marine habitats due to ground trawling and bad fishing methods. • Weak enforcement of fishing law. • Deterioration of wetlands ecosystem. • Lack of applying the traditional systems which regulate fishing season. • Lack of fish stock assessment and lack fisheries management plan. 	<ul style="list-style-type: none"> • Develop and conduct inventories and establish data base for the marine and coastal species and habitats identify their abundance and rare situation. • Evaluate grazing and wooding effect on mangroves and introduce for wood and camels forage alternative sources, in addition, replanting pilot and the affected areas. • Develop integrated marine and coastal management plans. • Establish marine and coastal protected areas at environmentally sensitive areas. • Encourage local communities to establish and participate in the sustainable management of the coastal zones. • Speed the establishment of the EPA, MoFW regional branches. • Conduct studies on the coastal and marine environment in order to prepare strategies for local communities for sustainable use of marine resources and rehabilitate the exhausted areas. • Conduct Programs and alternative for coastal communities' livelihood during fish reproduction season. • Develop programs to conserve the endangered coastal and marine species and habitats. • Enforce the fishing law. • Collect and document the traditional practices which organize the sustainable exploitation of coastal and marine resources. • Set up programs regulating the management of wetlands and protect its biodiversity. • Use alternative fishing techniques and gears, non destructive to coastal/marine habitats (Coral reef, sea grass beds etc....) • Develop fishing plans according to fish stock assessment. 	<p>Instit./ Individ.</p> <p>System/ Inst./ Individ.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>System/ Individ.</p> <p>Instit./ Individ.</p> <p>System/ Inst./ Individ.</p> <p>Instit./ Individ.</p> <p>Institutional.</p> <p>System/ Inst./ Individ.</p> <p>Instit./ Individ.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
7. Degradation and Descending the Production of Agriculture Biodiversity	<ul style="list-style-type: none"> • Degradation of local genetic resources due to the introducing invasive species. • Non rational use of chemical pesticides. • Shortage of data base networks and lack of the accuracy of the agriculture biodiversity information. • Overexploitation of water on Qat crop irrigation and shortage of water conservative systems. • Reduction of agricultural productivity due to drought and deterioration of sustainable agriculture production systems. • Negligence of positive traditional agricultural practices. • Misuse of agrochemicals (pesticides, fertilizers, and ripening materials). • Limited capacities and financial resources in the field of biodiversity and agricultural research. 	<ul style="list-style-type: none"> • Conduct research to improve plants species tolerate drought and introduce better management systems for terraces. • Encourage research to produce alternative sources of forage by using secondary products of agriculture industry as a source for forage to lower pressure on rangelands. • Encourage farmers to conserve the local crops germplasm on their natural habitat. • Encourage the integrated pesticides management (IPM) techniques. • Encourage the use of natural fertilizers as an alternative of chemical fertilizers. • Encourage planting alternative cash crops as grape and coffee instead of Qat. • Conduct pilot projects in land use and terrace management as well as desertification control and rangeland conservation. • Conduct programs to decrease ground water consumption through using treated waste water and raising water use efficiency. • Strengthen the Seed Banks. 	<p>Instit./ Individ.</p> <p>Institutional.</p> <p>System/ Inst./ Indiv. Instit./ Individ. System/ Inst./ Indiv System/ Individ. Instit./ Individ.</p> <p>System/ Inst./ Indiv.</p> <p>Instit./ Individ.</p>
8. Weak Handling of Biotechnology and Biosafety	<ul style="list-style-type: none"> • Lack in knowledge of probable risk on the biodiversity by handling and use of genetically modified organisms. • Lack of legislation and regulation which organize use and distribution of genetically modified organisms. • Weak national skills in the field of modern bio-technology management. • Shortage of policies related to Bio-technology and Biosafety. 	<ul style="list-style-type: none"> • Prepare and apply national policy for bio-technology and Biosafety and determine the safe options for using these technologies. • Activate the National Committee for Biotechnology and Biosafety and its secretary. • Establish data base for Biotechnology and Biosafety and activate information exchange programme. • Control and manage the side effects of using the genetically modified organisms. • Strengthen the capacity of organizations in the field of Biotechnology and Biosafety through establishing specialized laboratories and train the local staff. • Raise the staff knowledge in Biosafety and biotechnology proper management through training programme. 	<p>Instit./ Individ.</p> <p>Institutional.</p> <p>Instit./ Individ.</p> <p>Instit./ Individ. Instit./ Individ.</p> <p>System/ Instit.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
9. Limitations in Efforts to Manage Wastes	<ul style="list-style-type: none"> • Weak of applying the environmental measures to manage solid and liquid wastes. • Practicing harmful traditional actions which have negative effect on environment with the absence of environmental measures of waste management. • Low awareness and knowledge on the solid and liquid wastes effects. • Weak enforcement of the environment protection law. 	<ul style="list-style-type: none"> • Assess the quality of solid and liquid wastes which dumps on the border of coastal cities and harbors and evaluate the water quality. • Enforce concerned bodies and stakeholders including NGO's and local communities to adopt friendly to environment technologies. • Prepare and execute awareness programs on domestic wastes issues. • Prepare plans to improve sewage systems and conduct pilot projects on solid waste recycling to produce energy and fertilizers. • Enforce the bylaws prohibiting the industrial flushing (solid or liquid) wastes into the marine ecosystem and applying the measures of environmental impact assessment for all waste management projects. • Prepare and produce guidelines on solid wastes management. • Prepare and conduct systems for hazards wastes management. 	<p>System/ Instit./ Indiv</p> <p>System/ Instit./ Indiv</p> <p>Instit./ Individ.</p> <p>System/ Instit./ Indiv</p> <p>Instit./ Individ.</p> <p>Instit./ Individ.</p> <p>Institutional.</p>
10. Weak Policies and Legislations Enforcement	<ul style="list-style-type: none"> • Lack of integration between policies and legislations related to biodiversity issues. • Weak of the organizational ability enforce the laws and legislations related to biodiversity. 	<ul style="list-style-type: none"> • Set up and conducting a coordination mechanism between the concerned bodies in the field of policy and legislation matters. • Prepare programs for capacity building of the legislative directorate in EPA and concerned offices. • Establish specialized team to study and review policies, rules and legislations from related to biodiversity management institutions • Prepare and conduct national workshop to discuss and endorse the findings of the team. • Set up a mechanism to support institutions and apply policies and legislations related to biodiversity. • Establish an executing body to monitor and follow up enforcement of the legislation and policies related to biodiversity. • Set up awareness programs for NGO's to effective their participation in applying the biodiversity rules and legislations. 	<p>System/Institutional.</p> <p>Institutional/ Individ.</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p>



Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
<p>11. Weak Ability to Collect and Document the Genetic Resources and Regulate Their Use</p>	<ul style="list-style-type: none"> • Inability to collect biodiversity components. • Inability in determining the sources of Genetic Resources for different species in Yemen. • Inactivation in applying the policies and rules that organize the use of plant and animal Genetic Resources in a justifiable and proper way. 	<ul style="list-style-type: none"> • Strengthen the organizational structure of EPA and Research Centers to enable them to conduct surveys and document biodiversity components. • Set up and conduct training programs for the national staff to make them capable to carry out surveys and document the components of biodiversity. • Undertake inventories to document biodiversity components • Support the Genetic Resources Centers with the necessary equipments and instruments to enable them to fulfill their duties and undertake DNA analysis for biodiversity components. • Set up clear legislative mechanism to organize the benefit sharing of biodiversity components. • Set up a higher education programs for the national staff to improve their capability, in policies and rules related to International environmental agreements which regulate the use of seeds and species. • Prepare informative programs on the importance of International Conventions which regulate the exchange and use of biodiversity components. • Prepare guides on the national wrights and the justifiable use of genetic resources between different parties. 	<p>Institutional/Individ.</p> <p>Institutional/ Individ.</p> <p>Institutional/ Individ.</p> <p>Institutional/ Individ.</p> <p>System.</p> <p>Institutional/ Individ.</p> <p>Institutional/ Individ.</p> <p>Institutional/ Individ.</p>

Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
<p>12. Insufficient Apply of Environmental Impact Assessment</p>	<ul style="list-style-type: none"> • Inefficiency in applying the Environmental Protection Law. • Lack of trained staff and facilities. • Limited financial support. • Weak of institution structure responsible on Environmental Impact Assessment implementation. 	<ul style="list-style-type: none"> • Set up and conduct mechanisms to enforce the Environment Protection Law. • Set up and conduct programs for capacity building to the concerned staff in laws enforcement. • Prepare and conduct informative and awareness programs on Environment Protection Law and its implementation. • Set up arrangements to establish enforcement body (Court and specialized police) concerned with environment violation. • Evaluate current EPA and its branches capacity and identify their necessary needs. • Set up and conduct programs on capacity building for EPA staff. • Sign an agreement between EPA and Educational Research Centers and Yemeni Universities to include the environmental terminologies in educational curriculum. • Set up awareness programs for decision makers in the Ministry of Finance and Ministry of Planning about the importance of financial support to apply the mechanisms of Environmental Impact Assessment. • Set up and conduct programs for local staff of EPA on writing fund documentation. • Coordinate with Ministry of Finance to enact EPA financially according to the organizations and authorities' law. • Establish new branches for EPA in all governorates and support it with specialized staff. • Strengthen the EPA technical and financial capacity. 	<p>Institutional Instit./ Individ.</p> <p>Institutional/ Individ.</p> <p>Institutional/ Indiv.</p> <p>Institutional Institutional/ Indiv. Institutional</p> <p>Institutional</p> <p>Institutional/ Indiv. Institutional</p> <p>Institutional/ Indiv.</p> <p>System/ Instit.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
<p>13. Weak Capacity in Protected Areas Management</p>	<ul style="list-style-type: none"> • Limited Areas under protection and weak protected areas management. • Limited Coastal and marine areas under sustainable management. • Lack in protected areas management skills. • Overlaps in responsibilities and absence of coordination between related institutions. • Absence of funding from local budget. • Disappearance of traditional system and practices used for natural resources management. 	<ul style="list-style-type: none"> • Set up specifications of determining the sensitive habitats. • Carry out precise surveys on numbers, species and native animal and plant evaluate their situation (abundance and rarity). • Establish new protected areas and develop the old ones. • Carry out surveys on coastal/marine species, and produce maps on natural coastal habitats, identify the rare and endangered species. • Evaluate the effects of oppressive grazing and cuttings of mangroves and introduce alternatives for fuel and camel forages. • Establish and develop Integrated Coastal and Marine Area Management. • Prepare and conduct training programs for local staff and support the concerned organizations with qualified staff in management of the protected areas. • Arrange meetings with the staff of the universities and Research Centers to encourage them adopting research in the field of conserving environment. • Define a body to be responsible in the management of the protected areas. • Establish a coordination mechanism between different organizations and defining the roles of each side. • Prepare and conduct informative and awareness programs for local settlements, organization and for the system in general to encourage conserve biodiversity. • Set up enough costs from the local budget to conduct different activities to develop the protected areas. • Prepare project proposals to document and reuse traditional systems and practices in protected areas management. • Set up extension and educational programs for land owners to give some of their land for the Waqf tradition. • Prepare project proposals to reuse tradition systems and practices which regulate terrestrial and marine wild life hunting. 	<p>Institutional Institutional</p> <p>Institutional Institutional/ Individ.</p> <p>Institutional</p> <p>Institutional Institutional/ Individ.</p> <p>Institutional/ Individ.</p> <p>System/ Instit. System</p> <p>Institutional/ Individ.</p> <p>System/ Instit.</p> <p>Institutional/ Individ.</p> <p>Institutional/ Individ.</p> <p>Institutional/ Individ.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
14. Weak Capacity in Ex-situ Protection of Biodiversity Components	<ul style="list-style-type: none"> • Weakness in Genetic Centers technical and financial resources the. • Weak in preparation of integrated management programs on biodiversity components ex-situ conservation. • Inactivate the role of Marine Science Research Authority. 	<ul style="list-style-type: none"> • Establish Biodiversity (terrestrial, Agricultural and Marine) National Genetic Resources Centre under EPA responsibilities. • Prepare Project proposals to support the existing centers with facilities and equipments necessary for gene bank establishment. • Formulate project proposals to establish specialized genetic banks in the field of Horticulture K Range trees and shrubs and natural plants. • Prepare budgeted proposals to establish animal zoo for all species (farm, wild and marine) that exist in Yemen environment to multiply and conserve them. • Establish plant gardens in the different environments; include all species of plants specially rare and endangered. • Set up and conduct multiplication and management program for endangered species. • Prepare budgeted proposals including all facilities required to support Marine Science Research Authority. • Set up programs to breed and multiply commercial species that give high return as well as endangered species. • Establish exhibitions and marine plant and animal museums and aquariums. 	<p>Institutional</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional/ Individ.</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p>
15. Inadequate Studies and Inventories on Biodiversity Components	<ul style="list-style-type: none"> • Lack of ecological and biological studies for invasive species. • Lack of studies on the situation of endangered species. • Lack of data and information on the situation of natural habitats. • Absence of data base for biodiversity. • Insufficient skills to carry out surveys on and classify the components of biodiversity. • Scarcity of financial resources. 	<ul style="list-style-type: none"> • Conduct ecological and biological studies for invasive species. • Conduct studies on endangered species and suggest solutions to conserve them. • Establish data base on the situation of the natural habitats. • Establish data base for biodiversity in EPA and other concerned bodies. • Establish unified data base network for biodiversity in the concerned organizations. • Propose training programs to improve the qualification of the staff in the field of surveying and classifying biodiversity components. • Plan and adopt financial resources to conduct studies in identifying biodiversity components. 	<p>Institutional/ Indiv.</p> <p>Institutional/ Indiv</p> <p>Institutional/ Indiv</p> <p>Institutional/ Indiv</p> <p>Institutional/ Indiv</p> <p>Institutional/Indiv</p> <p>Institutional</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
16. Low Social Consciousness on Biodiversity Conservation and Protect Issues	<ul style="list-style-type: none"> • Weakness in integrating the concepts that relate to biodiversity in education curriculum. • Limited participation of NGO's in biodiversity conservation and protection. • Weak programs in awareness on biodiversity. 	<ul style="list-style-type: none"> • Set up a mechanism to integrate and up-date the concepts of biodiversity in education curriculum. • Set up and conduct training programs to activate the role of NGO's in the field of biodiversity conservation. • Set up and disseminate educational programs about biodiversity through different media sources. 	<p>Institutional</p> <p>Institutional</p> <p>Institutional/ Indiv</p>
17. Weak Capacity on Plans, Programs and Implementation and Report Writing	<ul style="list-style-type: none"> • Scarcity of financial resources to implement plans and programs. • Insufficient of staff and shortage in national training programs on biodiversity. • Unclearness and overlapping of the concerned organizations who work in biodiversity. • Shortage of national skills to prepare plans and programs as well as reporting. 	<ul style="list-style-type: none"> • Set up a mechanism to secure financial support and allocate incentives from the local budget to conduct activities and programs refelected in the National Strategy for Biodiversity. • Set up a mechanism to negotiate with external funding organizations to support programs and priority needs mentioned in the convention and in the national strategy. • Formulate a partnership convention between the concerned national organizations to direct the available financial resources and unifying efforts to strength and support the programs and activities included in the national strategy. • Set up and conducting training and educational programs in the field of biodiversity. • Formulate coordination committee between concerned organizations to propose clear mechanisms for identifying duties and commitments for every party. • Set up and conduct training programs to enable staff to prepare plans and programs as well as reporting. 	<p>System/ Institutional</p> <p>System/ Institutional</p> <p>System/ Institutional</p> <p>Institutional/ Indiv</p> <p>Institutional/ Indiv</p> <p>Institutional/ Indiv</p>
18. Limited Research and Training in Biodiversity	<ul style="list-style-type: none"> • Limitations in financial support to research and training programs. • Weakness in ground structure for organizations work in biodiversity. • Lack of coordination between research organizations. 	<ul style="list-style-type: none"> • Secure and allocate funds for research projects and training. • Set up a mechanism to strengthen and support acting organizations in biodiversity with equipments and information that are necessary to conduct their programs. • Train and improve qualification of staff work in biodiversity through scheduled plan. • Establish specialized committees to conduct shared research in biodiversity issues. 	<p>Institutional</p> <p>System/ Instit.</p> <p>Institutional/ Individ.</p> <p>Institutional</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Capacity Building Requirements	Intervention Level
19. Lack of Modern Technologies Using in Biodiversity and Biosafety	<ul style="list-style-type: none"> • Scarcity of financial needs. • Limited national capacity in this field. 	<ul style="list-style-type: none"> • Set up educational programs for decision makers. • Arrange training workshops in writing budgeted proposals in modern technologies. • Improve the capacity of researchers by training them in the field of biodiversity and Biosafety. • Set up and conducting training programs to enable staff and improving its capabilities. • Request funds to ensure the availability of facilities and tools to work with Biosafety. 	<p>Institutional/ Indiv Institutional/ Indiv. Institutional/ Indiv</p> <p>Individual Institutional</p>
20. Weakness of (Technical and Scientific) Collaboration and Biodiversity Information Exchange at Local, Regional and International Levels	<ul style="list-style-type: none"> • Weakness of staff in scientific and technical issues and in exchanging information at local and regional levels. • Limited data base information systems and absence of unified information systems. • Weakness in communication and scientific coordination between researchers and the concerned organizations inside and outside Yemen. 	<ul style="list-style-type: none"> • Hold specialized workshops to improve the capabilities of staff in the field of conserving biodiversity. • Establish systems for database and unifying them in network and updating what is available. • Prepare budgeted project proposals to ensure the availability of instruments and facilities necessary ease scientific contacts between researchers and scientific organizations. • Conduct workshops, conferences and training courses for all levels. • Publish and exchange specialized periodicals of biodiversity between organizations and research centers inside and outside Yemen. 	<p>Individual</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional Institutional</p>
21. Lack of Vision and Incentives in Conservation and Sustainable Use of the Components of Biological Diversity	<ul style="list-style-type: none"> • Limited knowledge of decision makers and stakeholders about the importance of protection and sustainable use of biodiversity. • Shortage of physical facilities and expertise that share in rapid improving and developing protected areas. 	<ul style="list-style-type: none"> • Organize workshops for decision makers and stakeholders to improve their environmental awareness. • Seek help from specialized personnel in setting up mechanism to carry out protection and conservation of biodiversity in-situ and ex-situ. • Conduct programs to incorporate stakeholders in protection efforts of biodiversity. • Produce informative programs to encourage the use of natural gas as a fuel instead of wood and also as car fuel to reduce air pollution. • Allocate enough budget to improve the protected areas and introducing alternatives as well as incentives for the victims of such protection. • Formulate and apply work programs easy to implement lead to biodiversity effective conservation during specific period of time. 	<p>Institutional</p> <p>Individual</p> <p>Institutional/ Indiv. Institutional</p> <p>Institutional</p> <p>Institutional/ Indiv.</p>



7.2.3 Climate Change Issues\ Gaps:

Constrain, Key Causes and Requirements for Capacity Needs for National priority Issues and Gaps:

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
1. Weak institutional structure of climate change unit	<ul style="list-style-type: none"> • Limited national expertise to effectively handle UNFCCC issues. • Limited capacity of the climate change unit. • Limited Funding resources for building capacity of CCU. 	<ul style="list-style-type: none"> • Clarify responsibilities of staff under job descriptions and establish a national scheme for remuneration and staff's welfare. • Prepare national plan for training institutional staffs. • Restructuring climate change unit to be more effective based on decentralize management. • Establish climate change units as parts of EPA branches in all districts. • Developing job requirements and detailed job descriptions to remove duplication in mandate • Establish an effective coordination mechanism between the climate change unit and other line institutions. • Prepare plans and national programs to be discussed with national investors and international agencies to acquire the necessary funding. 	<p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p>
2. Inadequate policy framework for integrating climate change issues in the national development planning	<ul style="list-style-type: none"> • Weak national capacity to mainstream related climate issues into general planning and strategy formulation. • Low level of awareness on climate change issues among policy makers. 	<ul style="list-style-type: none"> • Develop mechanisms for the coordination of planning activities to ensure mainstreaming climate change issues in the national development plans • Provide policy guidelines for mainstreaming climate change issues in the national development plans. 	<p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p>

Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
3. Inadequate policy and legal framework in related institutions and weak law enforcement	<ul style="list-style-type: none"> • Inadequate and Inappropriate integration of legal and policy framework in related institutions • Weak institution capacity and absence of effective coordination mechanism in strengthening law enforcement 	<ul style="list-style-type: none"> • Establish coordination mechanism to review and update laws and policies between related agencies to ensure integration. • Preparing and implementing capacity building programmes for strengthening legislative cadres of related institutions • Create effective mechanism to support capacity building in implementing and enforcing laws. • Establish legislative and accountable agency for enforcing environmental law. • Conducting public awareness programme for NGOs to be involved in monitoring and implementing and enforcing environmental law. 	<p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p>
4. Limited capacity in observing and monitoring, climate	<ul style="list-style-type: none"> • Inadequate capacity in observing and monitoring climate variability. • Inadequate financial support for Climate change research. • Lack of early warning system for draught and flood. • Inadequate technical infrastructure for weather prediction and modeling 	<ul style="list-style-type: none"> • Build up climate observing and monitoring capacity. • Provide Financial support • Install early warning system for draught and flood and ensure enough trained personnel. • Provide technical infrastructure for weather prediction and modeling. 	<p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p>
5. Limited human capacity on research and observation activities	<ul style="list-style-type: none"> • Inadequate Climate Change experts • Lack of documents reports, studies and database • Lack of adequate procedures and skills on accessing and sharing information needed for regularly update national communication • Lack of networking between the climate change unit and other line institutions 	<ul style="list-style-type: none"> • Prepare national plan for implementing training programmes • Ensure enough experts for climate change unit. • Conduct plan to employ qualified and specialized persons. • Strengthen the base of information sharing and cooperation among all relevant stakeholders including governmental, non-governmental, academic, and private sectors. • Provide adequate procedures and skills on accessing and sharing information needed for regularly update national communication. • Ensure networking between the climate change unit and other line institutions. 	<p>System/ Instit./ Indiv.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
6. Weak general foundation for regularly updating and publishing national GHG inventories and projections on self-reliant basis	<ul style="list-style-type: none"> • Insufficient capacity on data collection, processing and estimation of greenhouse gasses emissions. • Limited national expertise • Weak base for information sharing and cooperation among all relevant stakeholders including governmental, non-governmental, academic, and private sectors • Lack of surveys of soil, forest, transport and industrial activities • Lack of both hardware and Software facilities 	<ul style="list-style-type: none"> • Build capacity on data collection, processing and data exchange. • Ensure financial resources for training more personnel in data processing and data base management. • Technical training for institutional staff in preparation of inventories and national communication. • Accessibility to regional and international information to create specific databanks for particular issues. • Conduct surveys of soil, forest, transport and industrial activities to be able in estimating emission factors. • Provide both hardware and Software facilities. 	<p>Institutional/ Indiv. System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p>
7. Inadequate capacity to develop and maintain effective climate data base	<ul style="list-style-type: none"> • Poor Information Technology culture among national staff personnel in data processing and data base management • Lack of standard format for data management • Lack of tools for data acquisition, analysis and archiving • Inadequate financial resources for training 	<ul style="list-style-type: none"> • Raise up Information Technology culture among national staff personnel in data processing and data base management • Provide standard format for data management • Provide the necessary tools for data acquisition, analysis and archiving • Ensure enough funding and financial resources for climate change research activities. 	<p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p>
8. Limited Climate Change related Research	<ul style="list-style-type: none"> • Inadequate financial support for Climate change research. • Poor motivation and interest on environmental studies and activities in higher education. • Weak research orientation towards climate priority issues 	<ul style="list-style-type: none"> • Ensure enough funding and financial resources for climate change research activities. • Supporting and developing departments and collages at national universities that concerning with and related to environment science. • Provide libraries at universities with periodicals and references. • Prepare a list of research priority issues 	<p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
9. Low public awareness on climate change impact	<ul style="list-style-type: none"> • Inadequate capacity of conducting public awareness campaigns on climate change themes • Weak communication and corporation between EPA and the media • Low level of awareness on the Convention and related Protocols among policy makers in related institutions. • Lack of funding and shortage of specialized cadres on environmental issues at national media services institution 	<ul style="list-style-type: none"> • Prepare plan for strengthening the capacity of related institutions for training existing personnel and providing them with the required facilities and tools. • Strengthening communication and corporation between EPA and the media service institutions and exchange information related to climate change with them. • Expose policy makers at all levels to the convention and related protocols subjects through workshops, seminars, conferences and printed media. • Ensure the proper funding and train existing cadres on climate change themes 	<p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p>
10. Inadequate capacity for conducting and promoting educational and training programme on Climate change themes	<ul style="list-style-type: none"> • Limited qualified personnel in preparing educational and training programmes related to climate change issues. • Low level of awareness among policy makers about the importance of educational and training programmes on climate change. • Weak coordination among related institutions to incorporate climate change into their training Programmes. • Lack of funding for conducting and implementing educational and training programmes on climate change. 	<ul style="list-style-type: none"> • Design and implement training programme to build up personnel qualification in preparing educational and training programme and ensure providing the appropriate funding. • Organize workshops, seminars to raise up awareness and to ensure concrete information to policy makers to interact effectively with climate change issues. • Create permanent linkage with higher institutions of learning to ensure coordination and corporation in implementing climate change training programme • Ensure enough funding and financial resources for climate change training programme 	<p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>Institutional.</p> <p>System/ Instit./ Indiv.</p>



Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
<p>11. Limited reporting capacity to regularly update national communication meeting overall all needs and covering all areas as stated by the conventions</p>	<ul style="list-style-type: none"> • Lack of documents reports, studies and database for regularly update national communications • Lack of networking between the climate change unit and other line institutions. • Lack of adequate procedures and skills on accessing and sharing information needed for regularly update national communication • Inaccessibility of internet by national experts for the update of national communication. • Lack of common reporting guidelines for National Communication development • Non standardized format for gathering information on climate change and National communication preparation • Limited Funding and limited capacity of Climate Change unit • Inadequate Climate Change experts 	<ul style="list-style-type: none"> • Establish database system for regularly update national communications. • Establish networking system between the climate change unit and other line institutions. • Ensure accessibility of internet by national experts for the update of national communication. • Provide networking between the climate change unit and other line institutions. • Prepare common reporting guidelines for National Communication development. • Provide adequate procedures and skills on accessing and sharing information needed for regularly update national communication. • Prepare standardized format for gathering information on climate change and National communication. • Prepare national plan for implementing training programmes. • Ensure enough experts for climate change unit. • Conduct plan to employ qualified and specialized persons. 	<p>Institutional/ Indiv. System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional/ Indiv.</p> <p>Institutional</p> <p>Institutional/ Indiv. Institutional/ Indiv. Institutional</p>

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
<p>12. Inadequate capacity to adapt against climate change impact on water resources and to ensure sustainable use of water resources.</p>	<ul style="list-style-type: none"> • Weak of enforcement/applying of policies, plans regulating sustainable use of water resources • Weak awareness on the importance of sustainable use of water resources • Weak individual capacities. • Weak monitoring capacities to conserve water resources and protect it from pollution. • Weak enforcement of legislations regulating the use of water resources • Weak implementation of water law. • Lack of incentives for rationalization of water use. 	<ul style="list-style-type: none"> • Develop sustainable management plans for water resources in the upper watersheds and water harvesting principles to enhance and improve water resources quantity and its sustainable use. • Establish information, monitoring, evaluation and early warning systems in areas subjected to drought with emphasis on climatic, hydrological and socioeconomic factors. • Develop and implement training research and extension programs at the national level in the water resource sub-sector. • Formulate a plan to adopt and disseminate environmentally friend technologies and traditional knowledge and practices related to water harvesting and water use in irrigation and other purposes. • Establish a mechanism for coordination among parties related to water use and the legislative authorities and to eliminate contradictions in tasks between these authorities. • Establish a mechanism to revive monitoring of the implementation of the Water Law • Prepare awareness programme to encourage the sustainable use of water in agricultures practices. • Develop cost effective policy in water use especially in irrigation. 	<p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit.</p>

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
<p>13. Weak capacity to adapt against anticipated impacts of climate change on crop production</p>	<ul style="list-style-type: none"> • Shortage of laboratory faculties • Shortage in studies, research and extension services. • Weak capacity in vulnerability assessment. • Failure to develop new varieties. • Lack of technical knowledge of climate change impacts on the agricultural sector and food security. 	<ul style="list-style-type: none"> • Mapping out the vulnerable areas and identifying drought tolerant crops • Assess opportunities to improve crop production techniques and climate change impact on crop production • Classify and comprehensively describe the various crops with special emphasis on rain fed agriculture. • Conduct studies and research targeted for identification of drought-resistant crops and of the precipitation patterns. • Prepare agriculture manuals and calendars including sowing dates Identification of appropriate for cultivation in the selected four pilot areas. • Studies to identify crop management patterns, techniques and practices through changing sowing date, crop density, tillage practices, fertilizer levels, growing seasons of crops, making use of accumulated experience by farmers, collection and documentation of their local knowledge and experience, improving crop specific characteristics (harvest index, photosynthetic efficiency) and assess the new techniques impact • Test and apply recommended techniques where appropriate • Identify and introduce types of crops suitable to withstand the temporal and spatial climate shifting. • Collect additional soil, climate, farming and production data • Monitoring of technology transfer and adoption of modern techniques to adapt to climate change 	<p>Institutional/ Indiv. Institutional/ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Institutional/ Indiv.</p> <p>Institutional/ Indiv. Institutional/ Indiv.</p>

Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
14. Inappropriate land-use management	<ul style="list-style-type: none"> • Lack of guidelines, which integrate environmental issues with sustainable management of land resources. • Lack of integrates the Environmental Issues into policies and land use plans. • Lack of guidelines on climate issues and natural disasters integration with land use plans. • Lack of continuous monitoring on land use and land degradation. • Weak/lack/limited qualified staff in plans preparation on rational land use and its links with Environmental Conventions. 	<ul style="list-style-type: none"> • Develop guidelines integrates the environmental issues in sustainable land resources management. • Develop policies and land use plans considered different ecosystem and land tenure regime. • Develop guidelines for integrating climatic and weather information and natural disasters in the land use planning. • Develop and implement a mechanism for monitoring the deterioration of land resources • Create awareness and training programs policies and guidelines and environmental conventions related to land use implementers. • Establish a mechanism for coordination and cooperation between relevant authorities in land use. 	<p>Institutional</p> <p>System/ Instit.</p> <p>Institutional/ Indiv.</p> <p>Institutional/ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit.</p>
15. Weak capacity to implement integrated coastal management plan	<ul style="list-style-type: none"> • Inadequate Level of Available Resources. • Lack of legislative framework. • Weak technical and institutional capabilities; relatively new development. • Weak coordination among relevant agencies. • Absence of environmental monitoring and assessment capacities. • Weak environmental awareness and information base. • Poor knowledge of relationship between climate change and ICZM. • Lack of action and poor monitoring activities 	<ul style="list-style-type: none"> • Carryout a baseline bathymetric and topographic survey of coastlines of interest. • Implement Coastal Zone Monitoring Program. • Strengthen capacity building, awareness raising and information exchange. • Studying climate variability on the long-term and their impact. • Assess the climate change impact to develop Marine Protected Areas Management Plans. • Observe and investigate the oceanographic parameters on the coastal areas. 	<p>Institutional</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
16. Weak capacity in conserving Coastal/Marine Habitats	<ul style="list-style-type: none"> • Inadequate information on marine/coastal natural habitats in the Yemeni coast. • Shortage of information on sensitive natural habitats and their distribution. • The use of harmful fishing gears, which damage the marine and coastal natural habitats. • Over fishing. • Disposal of untreated solid and liquid wastes in the coastal sea water. • Disposal of debris and sweep in coastal natural habitats. • Degradation of marine/coastal habitat. • Lack of programmes to study the effect of climate change on the natural habitats and their biodiversity components. 	<ul style="list-style-type: none"> • Establish and implement a mechanism for regulating fishing and the use of proper fishing gears in different times of the year. • Implement inventories to list/count the coastal/marine habitats and identify their frequency (abundance and rarity) • Prepare and implement a plan for securing funds and staff for monitoring and conservation of coastal and marine resources • Develop integrated marine and coastal management plans (IMCAMP). • Develop fisheries management plan. • Establish mechanism to document the traditional knowledge and practices on marine/coastal fishing and marine resources use and then integrate it with the related laws and regulations. • Develop a programs for rehabilitation of degraded natural habitats • Prepare and implement programs to study the likely impacts of climate change on coastal/marine habitats and their biodiversity components • Undertake stock assessment studies for the living marine resources. 	<p>Institutional/ Indiv.</p> <p>Institutional</p> <p>Institutional.</p> <p>System/ Instit. System/ Instit. Institutional/ Indiv.</p> <p>Institutional. System/ Instit./ Indiv.</p> <p>Institutional</p>
17. Weak capacity in conservation and rehabilitation of wet land	<ul style="list-style-type: none"> • Low awareness on wet lands economic and environmental values. • Shortage of qualified staff. • Lack of extension programs on wet lands use. • Inadequate policies and plans highlighting the wetlands importance. 	<ul style="list-style-type: none"> • Implement awareness programs on wet lands significance on the environmental system and the importance of preserving it. • Implement applied training programs on proper technologies use in wet lands • Implement extension programs on the agricultural practices suitable for the wet lands • Develop and implement wet lands use policies and plans • Implement surveys on species identification in wet lands • Identify the economic and environment values of the wet lands • Formulate rehabilitation programs for degraded wet lands • Establish and implement a mechanism for coordination among relevant parties use wet lands. 	<p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv. Institutional/ Indiv. Institutional. System/ Instit./ Indiv. Institutional.</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Key Causes	Requirements for Capacity Needs	Intervention Level
<p>18. Weak capacity to mitigate GHG emissions and to enhance GHGs Sinks</p>	<ul style="list-style-type: none"> • Lack of Policy frameworks to abatement GHG emissions and enhance forest sinks • Lack of national mitigation plan with necessary norms and benchmark. • Low awareness on mitigation activities • Lack of an appropriate Economic/energy policy. • Lack of Efficiency improvements programme in energy utilization and consumption • Lack of skills and experience to assess technologies. • Lack of a national plan to integrate forests and natural rangelands management and to develop it in accordance to economical and environmental benefits. • Absence of adaptation and mitigation project guidelines. • Lack of national and international investment programme on the sustainable management of carbon sinks. • Lack of agro-forestry Programme • Inadequate coverage of protected areas 	<ul style="list-style-type: none"> • Prepare and implement Policy frameworks to abatement GHG emissions and enhance forest sinks • Prepare national mitigation plan with necessary norms and bench mark such as: <ul style="list-style-type: none"> 1-Air Quality standards. 2-Efficiency standards. 3-Appliance efficiency standards. 4-Building energy-related codes and standards. • Rising awareness on adaptation and mitigation activities • Prepare and implement an appropriate Economic/energy policy. • Prepare an efficiency improvements programme in energy utilization and consumption • Prepare training plan to build and gain the skills and experience to assess technologies • Expanding the scope of investment in natural gas and preparing plans for using natural gas for electrical energy production and the industrial sector • Awareness rising to use of renewable energy facilities: Biomass energy, wind power and solar thermal and switching to low carbon content fuel. • Establishing an effective financial mechanism to provide capital for renewable energy development and reducing the tax rate on renewable energy systems. • Energy planning at different levels, central and local, should begin to set goals and timetable for increasing the use of renewable energy technologies where opportunities for the use of renewable energy systems are economically warranted. • Efficient traffic management system. • Introduce Compound Cycle Cogeneration System • Inter -Fuel Substitution in rural areas. • Transportation Emission Control Measures (TCMs). • Data Management and Information System (DMIS). • Prepare a national plan for integrated forests and natural rangelands management and develop it in accordance to economical and environmental benefits. • Develop Adaptation and Mitigation project guidelines • Prepare national and international investment programme on the sustainable management of carbon sinks. • Prepare agro-forestry programme • Ensure adequate coverage of protected areas. 	<p>System/ Instit. Institutional.</p> <p>Institutional. System/ Instit. Institutional/ Indiv. System/ Instit./ Indiv. System/ Instit.</p> <p>Institutional/ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv. System/ Instit. Institutional Institutional. Institutional/ Indiv. System/ Instit./ Indiv.</p> <p>System/ Instit./ Indiv. System/ Instit./ Indiv.</p> <p>Institutional. Institutional</p>



7.3 Annex (3): Cross Cutting Environmental Issues\ Gaps Analysis:

Issue\ Gap	Causes	Requirements for Capacity Needs	Intervention Level
1. Overuse of Water Resources	<ul style="list-style-type: none"> • Weak of enforcement/applying of policies, plans regulating sustainable use of water resources. • Weak awareness on the importance of sustainable use of water resources. • Weak individual capacities. • Weak monitoring capacities to conserve water resources and protect it from pollution. • Weak enforcement of legislations regulating the use of water resources. • Weak implementation of water law. • Lack of incentives for rationalization of water use. 	<ul style="list-style-type: none"> • Develop sustainable management plans for natural resources in the upper watersheds and for water harvesting principles to enhance and improve water resources quantity and its sustainable use. • Establish information, monitoring, evaluation and early warning systems in areas subjected to drought with emphasis on climatic, hydrological and socioeconomic factors. • Develop and implement training research and extension programs at the national level in the water resource sub-sector. • Formulate a plan to adopt and disseminate environmentally friend technologies and traditional knowledge and practices related to water harvesting and water use in irrigation and other purposes. • Establish a mechanism for coordination among parties related to water use and the legislative authorities and to eliminate contradictions in tasks between these authorities. • Establish a mechanism to revive monitoring of the implementation of the Water Law. • Prepare awareness program to encourage the sustainable use of water in agricultures practices. • Develop cost effective policy in water use especially in irrigation. • Allocate adequate budgets to implement the integrated management of water resources. 	<p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>System/Institutional.</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>System/Institutional</p>
2. Sustainable Land Resources Management	<ul style="list-style-type: none"> • Lack of guidelines which integrate environmental issues with sustainable management of land resources. • Lack of integrate the Environmental Issues into policies and land use plans. • Lack of continuous monitoring on land use and land degradation. • Weak/lack/limited qualified staff in plans preparation on rational land use and its links with Environmental Conventions. • Weak coordination and cooperation among concerned authorities in the field of land use 	<ul style="list-style-type: none"> • Develop guidelines integrates the environmental issues in sustainable land resources management. • Develop policies and land use plans considered different ecosystem and land tenure regime. • Develop guidelines for integrating climatic and weather information and natural disasters in the land use planning. • Develop and implement a mechanism for the land resources deterioration monitoring. • Create awareness and training programs policies and guidelines and environmental conventions related to land use implementers. • Establish a mechanism for coordination and cooperation between relevant authorities in land use. 	<p>Institutional</p> <p>System/Institutional</p> <p>Institutional/Individ</p> <p>Institutional</p> <p>Institutional/Individ</p> <p>System/Institutional</p>

Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Needs	Intervention Level
<p>3. Degradation of Forests and Natural Rangelands</p>	<ul style="list-style-type: none"> • Weak of suitable systems for forestry and natural rangelands management. • Random herding and wood cutting in natural forests. • Low technical expertise in natural forest and range management and methods of their utilization. • Lack of alternatives to improve livelihoods and development of local poor communities to improve their income and provide incentives for local population. • Lack of coordination among concerned parties. • Weak technical and financial capacities. • Lack of plans and studies related to conservation of biodiversity, range and agro forestry components. • Lack of facilities to collect, compile and document local knowledge, traditions of conservation of biodiversity and agro forestry. • Lack of documentation of traditional knowledge in forestry and range management. • Deterioration and erosion of valuable range and forestry species. 	<ul style="list-style-type: none"> • Finalize the forestry and combating desertification law with it's by laws in harmony with issued laws and without jeopardizing the biodiversity in the country. • Prepare a national plan for integrated forests and natural rangelands management and develop it in accordance to economical and environmental benefits without jeopardizing the biodiversity. • Establish a gene bank for seed conservation to develop natural vegetative cover of range lands. • Establish a program for capacity building in research, education, extension, range awareness. • Establish a data base with GIS and remote sensing use. • Prepare and implement a framework for real participation of all concerned with the development and use of range resources. • Develop and implement plans to revive traditional herding and the use of range rotation. • Establish and implement a program for collection, documentation and revival of traditional practices related to protection and rational use of forestry and range resources and improve these through the application of modern technology. • Allocate adequate funds for the management and development of forestry and range management. • Develop water harvesting systems suitable with the type of forests and rangelands. 	<p>System/Institutional</p> <p>Institutional</p> <p>Institutional</p> <p>Sys.\Instit.\Individ</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional/Individ</p> <p>System/Institutional</p> <p>Institutional</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Needs	Intervention Level
4. Coastal/Marine Habitats Degradation	<ul style="list-style-type: none"> • Inadequate information on marine/coastal natural habitats in the Yemeni coast. • The use of harmful fishing gears, which damage the marine and coastal natural habitats. • Over fishing. • Disposal of untreated solid and liquid wastes in the coastal sea water. • Disposal of debris and sweep in coastal natural habitats. • Degradation of marine/coastal habitat. • Lack of programs to study the effect of climate change on the natural habitats and their biodiversity components. 	<ul style="list-style-type: none"> • Establish and implement a mechanism for regulating fishing and the use of proper fishing gears in different times of the year. • Implement inventories to list/count the coastal/marine habitats and identify their frequency (abundance and rarity). • Prepare and implement a plan for securing funds and staff for monitoring and conservation of coastal and marine resources. • Develop Integrated Marine and Coastal Areas Management Plans (IMCAMP). • Develop fisheries management plan. • Establish mechanism to document the traditional knowledge and practices on marine/coastal fishing and marine resources use and then integrate it with the related laws and regulations. • Develop a programs for rehabilitation of degraded natural habitats. • Prepare and implement programs to study the likely impacts of climate change on coastal/marine habitats and their biodiversity components. • Undertake stock assessment studies for the living marine resources. 	<p>Institutional/Individ</p> <p>Institutional</p> <p>Institutional.</p> <p>Institutional.</p> <p>Institutional.</p> <p>Institutional.</p> <p>Institutional/Individ</p> <p>Institutional</p>
5. Loss of Wet Lands	<ul style="list-style-type: none"> • Low awareness on wet lands economic and environmental values. • Shortage of qualified staff. • Lack of extension programs on wet lands use. • Inadequate policies and plans highlighting the wet lands importance. 	<ul style="list-style-type: none"> • Implement awareness programs on wet lands significance on the environmental system and its economic values. • Implement applied training programs on proper technologies use in wet lands. • Implement extension programs on the agricultural practices suitable for the wet lands. • Develop and implement wet lands use policies and plans. • Implement surveys on species identification in wet lands. • Identify the degraded wet lands and formulate rehabilitation programs for them. • Establish and implement a mechanism for coordination among relevant parties use wet lands. 	<p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Needs	Intervention Level
6. Spread of Invasive Alien Species	<ul style="list-style-type: none"> • Weak coordination among concerned agencies in transport of genetic resources components. • Weak capacities in designing strategies to control invasive species. • Lack of policies and legislations related to transport, trade of biodiversity components. • Lack of data on the invasive alien species. • Lack of awareness on the invasive alien species issues. • Limited studies and research programs on invasive species. • Weak awareness on the invasive species. 	<ul style="list-style-type: none"> • Establish a mechanism for coordination and cooperation between relevant authorities in the management of renewable natural resources in data collection and exchange of information on invasive species. • Promote research and studies programs on invasive species and the magnitude of their spread and their impact and means for their management and control. • Create a list of invasive species and identify the dangerous species and their impact on ecosystem systems and natural habitats. • Formulate a plan on institutional capacity building to ensure identification, monitoring and management the invasive species. • Evaluate current policies and legislations related to renewable natural resources and complete shortcomings pertinent to invasive species. • Implement a national plan to list, monitor, management and control invasive species to restrict their widespread. • Create a data base and information pool related to invasive alien species. • Implement extension, awareness and communication programs on issues related to invasive species. 	<p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional</p> <p>System</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p> <p>Institutional/Individ</p>
7. Limitations in Completion and Enforcement of Polices, Legislations and Laws in Environmental Issues	<ul style="list-style-type: none"> • Weak of Policies and Legislations and Laws Integration/coordination and delay in incompletion of some of them. • Low awareness of decision maker and implementers of laws about the importance of Environmental Issues. • Lack of coordination among different authorities engaged in enforcing laws, policies and legislations related to the Environment. 	<ul style="list-style-type: none"> • Establish and implement effective mechanism for coordination among concerned parties in environmental laws to ensure revival, integration and implementation of policies, legislations and laws. • Formulate a team to study and review policies and laws to avoid duplication and fill the gaps. • Implement training programs to improve capacity of law makers and law enforcers engaged in environmental. • Establish and implement awareness programs and consultation meetings for decision makers • Support and revive legal departments in the related to environment management institution and provide them with skilled staff. • Establish an effective management structure to coordinate among law departments between concerned entities. • Formulate a unified law enforcement to monitor, follow-up, the implementation of the environmental laws and legislations. 	<p>Sys./Instit./Individ</p> <p>Institutional</p> <p>Institutional/Individ</p> <p>Institutional/Individ.</p> <p>Institutional</p> <p>System/Individual</p> <p>System</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Needs	Intervention Level
8. Weak Capacities in Preparing Programs and Report Writing	<ul style="list-style-type: none"> • Limited negotiating experience and limited training programs. • Unclear tasks and vague responsibilities among different agencies engaged in the preparation of plans, programs and report writing. • Limitations in the institutions capacity of the related to environment management institution in plans and programs preparation and marketing and report writing. • Limited Financial Resources. • Lack of skills on report writing (Drafting) 	<ul style="list-style-type: none"> • Establish a data base on national resource persons. • Prepare and implement training programs to improve negotiations capacities in plans, programs preparation and reporting. • Prepare a plan to seek assistance of experts not available nationally. • Formulate a joint coordination structure with representative of all national committees and prepare by laws for their smooth functioning. • Prepare a unified structure for the departments dealing with the three UN Conventions. • Expedite the implementation of the administrative and financial reform program. • Improve the negotiations capacity and in preparing projects in a realistic manner to secure funding from donor agencies. 	<p>Institutional/Individ Institutional/Individ</p> <p>Institutional Institutional</p> <p>Institutional Institutional Institutional/Individ</p>
9. Limited Research Activities on the Environmental Issues	<ul style="list-style-type: none"> • Weak infrastructure and limited support to research activities. • Limited qualified staff and limited higher degree education with emphasis on environmental issues. • Limitation in identification of research priorities and weak coordination among research institutions in Yemen. 	<ul style="list-style-type: none"> • Allocate funds to strengthen infrastructure and finance research programs in the institutions working on environmental issues. • Allocate funds for higher education and training programs of the national staff. • Support and develop infrastructure of institution working in environmental issues. 	<p>System/Institutional</p> <p>Institutional/Individ Institutional/Individ</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Needs	Intervention Level
10. Low community awareness and weak extension and communication activities in environmental issues	<ul style="list-style-type: none"> • Weak capacities and infrastructure in institutions engaged in the preparation of awareness and communication programs. • Weak communication channels and coordination between EPA and the media in the preparation of environmental communication materials. • Limited resources and low qualified staff in environmental extension and communication. • Limited awareness among decision makers in the concerned institutions (Government agencies, Ministries, Local Authorities, and (NGOs). 	<ul style="list-style-type: none"> • Prepare budgeted programs to strengthen and support infrastructure of institutions engaged in environmental communication. • Establish a department dealing with environmental communication in (EPA). • Allocate adequate funds to plan and implement extension and awareness environmental programs. • Prepare a training program to improve capacities of technical and specialized staff. 	<p>Institutional</p> <p>Institutional System</p> <p>Institutional/Individ</p>
11. Lack of Information Management System (Collection, Analysis and Exchange)	<ul style="list-style-type: none"> • Limitations in national information system requirement, scattered facilities and data among multiple institutions. • Limited qualified staff and low capacities of available staff. 	<ul style="list-style-type: none"> • Establish a National Environmental Information Center (NEIC) under the umbrella of (EPA). • Prepare a project document to seek donor assistance to establish the NEIC and its branches. • Prepare training programs for (NEIC) staff and the units located at the governorate level. 	<p>System</p> <p>System</p> <p>Institutional/Individ</p>
12. Limitations in Education and Training Curricula	<ul style="list-style-type: none"> • Limited and low capacity of specialized staff in preparing training programs and education curricula in the concerned institutions and lack of coordination among these institutions. • Limited knowledge of decision makers in the concerned institutions. • Limited material resources. 	<ul style="list-style-type: none"> • Prepare and implement budgeted programs to improve capacities of national staff to be able to prepare education and training curricula in environmental issues. • Formulate a specialized committee from different concerned authorities to review periodically training and education curricula. • Organize training programs, scientific conferences for decision makers in government agencies and Civil Society Organizations and Local Councils. • Prepare annual budgeted program covering targeted training and educational curricula. 	<p>Institutional/Individ</p> <p>Institutional</p> <p>Institutional</p> <p>Institutional</p>



Final Report and Action Plan for Environmental Capacity Development

Issue\ Gap	Causes	Requirements for Capacity Needs	Intervention Level
13. Limitation in Diagnosis, Prognosis, Monitoring and Evaluation Requirements	<ul style="list-style-type: none"> • Lack of infrastructure for monitoring and diagnosis. • Limited awareness on the importance of monitoring and diagnosis. • Lack of monitoring and evaluation of natural phenomenon. 	<ul style="list-style-type: none"> • Establish a national center for Diagnosis of natural disasters and the appropriate mitigation plans. • Prepare a proposal for an integrated project for the support of the newly established center. • Prepare workshops and consultation meetings involving decision makers to highlight the importance of diagnosis and prognosis of natural disasters. • Provide the Diagnosis center with adequate funds and adequate staff. • Incorporate in the tasks of the prognosis center a system of monitoring and evaluation of natural disasters and consider this a priority. 	<p>System/Individ Institutional Institutional/Individ</p> <p>System System/Individ</p>
14. Limitations in the Application of Environmental Impact Assessment	<ul style="list-style-type: none"> • Weak institutional capacities of intuitions engaged in Environmental; Impact Assessment. • Limited staff and limited resources available. • Limited financial support. 	<ul style="list-style-type: none"> • Strengthen the institutional set up of the EPA to include a General Directory on reviewing and monitoring and formulating EIA Terms of reference. • Create branches of EPA in major agro ecological zones. • Prepare training courses on EIA based on actual needs. • Support the central agency and its branches with required supplies to be able to conduct its tasks smoothly. • Expedite the issuing of the resolution of EPA to be able to collect fees for EIA. 	<p>Institutional/Individ</p> <p>Institutional/Individ Institutional/Individ Institutional</p> <p>Institutional</p>
15. Weak Scientific and Technical Cooperation, Exchange of Information in Environmental Issues	<ul style="list-style-type: none"> • Limited capacities of staff engaged in the concerned departments (EPA, GD Forestry) in issues related to communication and outreach with local and external agencies. • Limited vision of decision makers on the importance of capacity building in scientific and technical cooperation and exchange of information. 	<ul style="list-style-type: none"> • Prepare plans for capacity building in the field of scientific and technical cooperation involving staff of EPA. • Provide the relevant department in EPA with qualified staff in technical and scientific cooperation. • Prepare awareness programs and organize consultation meetings involving decision makers in the relevant institutions with interest in environmental issues. 	<p>Institutional/Individ</p> <p>Institutional</p> <p>Institutional/Individ</p>



7.4 Annex (4): Project Profiles:

PROJECT PROFILE (1)

Project Title	:	Raising the Public Awareness on Environmental Issues
Implementing Agency	:	EPA
Collaborative Agencies	:	Research Agencies, Universities MWE and MOE
Estimated Budget	:	US\$ 1,130,000
Time Frame	:	Three years
Sources of Finance	:	Funding Agencies

RATIONALE

It is generally agreed in Yemen that awareness over environmental issues among different groups of society is by far insufficient to mobilize community and government efforts towards sustainable development. In particular, government agencies, NGO's and local communities efforts up till now are non-existing or under resourced to respond to environmental issues.

As long as this situation remains so, environmental concerns will remain out of the government and society interest while planning development plan and policies for both national and local levels.

Specific needs in this regards is to launch a nation-wide and awareness campaign on environmental issues to ensure sustainable resources management.

The campaign will be targeted to government policy makers, non-governmental organizations, media men, and local communities. The aim of the campaigns is to increase understanding of environmental issues among target groups utilizing numbers of awareness tools, including awareness campaigns, TV, radio mass and press programs, community workshops, fact sheets and brochures production, electronic information and other communication materials... etc.

STRATEGIC GOAL

Rising environmental awareness of Yemeni society by integrating environmental themes in university and school curricula, promoting green media, and launching nationwide public awareness campaigns.

OBJECTIVES

1. To promote public awareness on various aspects of environmental issues through awareness campaigns, TV, radio mass and press campaigns, community workshops, fact sheets and brochures production, electronic information and other communication materials.
2. To strengthen inter-agency communications to enhance free move and exchange of environmental information & awareness materials.
3. To expand awareness of youth organizations to cover all environmental issues.
4. To improve professional skills EPA staff, information staff, teachers and university lecturers in producing and disseminating awareness materials on environmental issues.

ACTIVITIES

- Establish environmental communication units in relevant environmental agencies.
- Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information.
- Train staff of media & communication units on data acquisition, processing and production and dissemination of awareness materials.
- Assess capacity needs for incorporating environmental themes into schools and universities.
- Develop national policy on Environmental Education (EE).
- Integrate green themes into the education curricula of schools and universities.
- Establishment of youth green clubs in schools in all governorates.
- Improve professional skills of teachers and university lecturers in producing and teaching environmental topics.
- Prepare awareness strategy on values, importance and maintenance of major environmental assets.
- Promote environmental public awareness campaign through TV and radio mass media, community workshops, fact sheets and brochures production, electronic information and other communication materials.
- Expand establishment of green media and NGOs to act as advocacy groups for the protection of nature and the environment.
- Promote and facilitate community awareness and involvement in protection of environment.
- Design and launch public information and mass media campaigns.
- Provide training for policy makers, NGOs and local communities in the three themes (specific target groups may include agricultural and coastal communities, framers, members of parliament high level government employee, environmental experts, media workers, artists, school children, and politicians... etc).
- Provide training for media men and environmental staff on various environmental issues.
- Program development for written media.

- Production of educational/awareness materials, extension materials, learning modules and programs for the three target themes.
- Mobilize key stakeholder e.g. community leaders, political leaders, NGOs and local community to support integration of environmental issues into national and local environmental strategies and plans.
- Production and broadcasting of (audio-) visual awareness material by local and central TVs and Radios.
- Integrate climate change issues in the activities of school clubs.

EXPECTED RESULTS

- Environment themes adequately integrated into educational curricula at university and school levels.
- Constructive change of student and teachers attitudes towards environmental issues.
- Environmental advocacy groups among youth created to support the environmental issues.

INDICATORS

- Four environmental communication units established at EPA, GDFCD, AREA, NWRA, and MSRA.
- Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information.
- Train staff of media & communication units on data acquisition, processing and production & dissemination of awareness materials.
- Environmental topics integrated into schools and universities curricula.
- Schools and universities instructors adequately trained on teaching environmental topics.
- Environmental clubs replicated in major schools across all governorates.
- A national awareness strategy targeting various audience & environmental themes developed & implemented.
- Several message-driven awareness programs publicly launched.
- Several message-driven (on rangelands, forest and wetlands, and biodiversity) extension programs executed in rural areas.
- A national Programme on best environmental practices and traditional knowledge implemented.
- Capacity building programs for local community, media men, teachers, researchers, educators, and extension officers provided.
- More green media established.
- Greater public role in planning, executing and monitoring environmental issues at community levels.
- Awareness on environmental issues enhanced among policy makers, NGOs, youth clubs, and local communities of there target sectors.
- Increased local government awareness on the environmental issues.
- EPA adequately strengthened and supported with necessary information and technology equipment plus adequate skilled staff to produce and disseminate awareness materials on environmental issue on sustainable basis.

Final Report and Action Plan for Environmental Capacity Development

- Targeted campaigns on key environmental issues completed.
- Awareness and training workshops held for target groups in the three conventions themes.
- Audio-visual materials (e.g. posters, TV spots, radio programmes, documentaries, newspaper articles) produced and disseminated to target groups in the three conventions themes.
- Project staff, including coordination mechanism established and implemented in EPA.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Prepare awareness strategy on values, importance and maintenance of major environmental assets	10,000
Promote environmental public awareness campaign through TV and radio mass media, community workshops, fact sheets and brochures production, electronic information and other communication materials	200,000
Expand establishment of green media and NGOs to act as advocacy groups for the protection of nature and the environment	50,000
Establishment of youth green clubs in schools in all governorates	150,000
Integrate green themes into the education curricula of schools and universities	120,000
Develop training programs for teachers, to enable them developing and teaching environment themes	100,000
Implement a national programme on best environmental practices & traditional knowledge implemented	50,000
Implement capacity building programs for local community, media men, teachers, researchers, educators, and extension officers	200,000
Enhance community awareness and involvement in protection of environment	100,000
Extension program on rangeland, forest, wetland and biodiversity in rural areas	100,000
Increase awareness on MEA's conventions and funding mechanism among policy makers	50,000
Total	1,130,000

PROJECT PROFILE (2)

Project Title	: Strengthening institutional capacity in the field of Biotechnology and Biosafety
Implementing Agency	: EPA
Collaborative Agencies	: GDFCD, AREA, MAI, MWE, and MSRA
Estimated Budget	: US\$ 480,000
Time Frame	: Three years
Sources of Finance	: Funding Agencies

RATIONALE

There are potential risks associated with the use and release of Living Modified Organisms (LMOs) and the introduction of biotechnology on human and biological diversity. To mitigate these potential risks, strengthening institutional capacity on Biotechnology and Biosafety is crucial for the use of appropriate biotechnologies in environmental management as well as the formulation of safety criteria and guidelines for biotechnology.

Capacity requirements include institutional restructuring, strengthening of natural resources planning and management capacities, establishment and operation of environmental monitoring systems, upgrading of legal frames and information bases, resource mobilization and support participation of relevant agencies, target groups and local communities.

STRATEGIC GOAL

Mitigation of potential risks associated with the use and release of living modified organisms (LMOs) and the introduction of biotechnology on human and biological diversity.

OBJECTIVES

1. To mitigate the potential risks associated with the use and release of Living Modified Organisms (LMOs) and the introduction of biotechnology on human and biological diversity.
2. To harmonize research activities and raise awareness about the potential risks associated with using biotechnology and about the bio-safety issues.
3. To establish a national bio-safety data base to be publicly accessible.

ACTIVITIES

- Prepare and apply national policy for bio-technology and Biosafety.
- Assess options for the safe transfers & use biotechnologies.
- Establish data base for Biotechnology and Biosafety and activate information exchange programme.
- Control and manage the side effects of using the genetically modified organisms.
- Strengthen the capacity of organizations in the field of Biotechnology and Biosafety through establishing specialized laboratories and train the local staff.

EXPECTED RESULTS

- National Biosafety Framework developed.
- Survey of existing biotechnologies and status of safety in biotechnology application completed.

INDICATORS

- A national biotechnology policy and biosafety frameworks prepared and enforced.
- Stock-taking on the safe use of biotechnologies published.
- Laws on LMOs and Biotechnology prepared and enacted.
- Staff of the National Committee for Biotechnology and Biosafety trained on LMOs and Biotechnology.
- A National Biosafety Database established and publicly accessible.
- Number of genetically engineered species safely introduced and controlled.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Prepare and apply national policy for bio-technology and bio-safety	10,000
Assess options for the safe transfers and use biotechnologies	100,000
Strengthen the capacity of organizations in the field of Biotechnology and Biosafety through establishing specialized laboratories and train the local staff	200,000
Establish a national biotechnology and biosafety database	50,000
Publish stock-taking on the safe use of biotechnologies	100,000
Prepare and enact laws on LMOs and biotechnology	20,000
TOTAL	480,000

PROJECT PROFILE (3)

Project Title	:	National Vulnerability Assessment, Adaptation and Mitigation Options Study
Implementing Agency	:	MWE, EPA
Collaborative Agencies	:	MAI, MFW, CAMA, GDFCD and Research Institutions
Estimated Budget	:	US\$ 870,000
Time Frame	:	Three years
Sources of Finance	:	Funding Agencies

RATIONALE

Yemen as a signatory party of UNFCCC has carried out a preliminary vulnerability and adaptation assessment in water resources, agriculture and coastal and marine sectors. There is need to conduct detailed studies on vulnerability and adaptation to climate change, monitoring the dynamics of emissions as well as mitigation plan in the energy sector. Furthermore, to put in place a regulatory framework for implementation of adaptation and mitigation projects.

Yemen has insufficient capacity to implement climate change programs without building its capacity in terms research activities and technology assessment as an essential ground for projects development. Furthermore, no organizational structure, procedures or plans exists for promoting renewable energy use. If institutional barriers are addressed adequately there are potentially significant environment, social and economic gains to be obtained from CDM involvement. There is also lack of norms and benchmarks related to: Air Quality standards, efficiency standards, appliance efficiency standard and building energy-related codes and standards. Yemen capacity to adopt new technologies is also constrained by lack of skills and experience to assess options of mitigation technologies and lack of research centers in energy and environment friendly technology.

The research activities will assist in the establishment of a specialized institutional arrangement within the climate change unit of EPA and will also assist in engaging government, private sector, NGO's and potential international investors to develop and create appropriate environment for nationalization of CDM projects.

STRATEGIC GOAL

Expanding the knowledge base on climate change and strengthening institutional capacity to formulate and implement programs on monitoring, adaptation and mitigation of climate change.

OBJECTIVES

1. To conduct detailed studies on vulnerability and adaptation to climate change.
2. To strengthen institutional capacity to formulate and implement adaptation and mitigation programs.
3. To promote renewable energy use.
4. To gain significant environment, social and economic from CDM involvement.
5. To build capacity in terms of research activities and technology assessment to implement climate change programs.

ACTIVITIES

- Enhance the joint mechanism for CDM development consisting of MWE, MOE, MOC, MPIC, MAI, MITC, and other concerned & public and private, along with academic and research institutes.
- Enhancement of the newly established climate change unit to continuously handle climate change issues, whether on the national, regional or international level.
- Develop and implement national mitigation plan for energy sector.
- Promote adoption of clean technologies by industry, in particular in the small and medium sector, through regulatory and fiscal measures, and standards setting.
- Develop and implement a Policy framework and a National Adaptation Programme of Action (NAPA) to adapt to climate change in most vulnerable sector to anticipated climate change.
- Enhance information base through creating and maintaining a national climate change web page with links to national, regional and international sources of information.
- Create a database on clean technologies, and promote dissemination of new technologies developed both in Yemen and abroad.
- Promote climate change and technology research with focus on climate profiles and modeling, development of GHG inventories and emission scenarios, and vulnerability and adaptation assessment for vulnerable sectors.
- Provide training to new GHG inventory experts and university students for each GHG inventory category.

EXPECTED RESULTS

- Rational energy use and reduction of CO₂ emissions as a result of promotion of clean technologies, and the enforcement of norms in energy related sectors.
- Energy production scheme of lower pollution and cost promoted due to introduction of renewable energy.
- Higher population access to electricity ensured in rural poor areas as a result of shift to renewable energies.

INDICATORS

- A report on options to mitigate GHG emissions from energy sector published.
- A mechanism for development, adaptation and evaluation of clean technologies is in place and functioning.
- Capacity of climate change unit adequately strengthened to handle climate change issues.
- A National mitigation plans (NMP) for reducing greenhouse gases emissions from energy sector developed and implemented.
- A National Adaptation Program of Action (NAPA) implemented.
- Clean technologies promoted by public sector and small and medium industry.
- A national climate change web page established and accessible.
- A database on climate change & clean technologies developed and implemented at EPA.
- National staff trained on new technologies.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Publish a report on options to mitigate GHG emissions from energy sector	20,000
A mechanism for development, adaptation and evaluation of clean technologies	50,000
Develop and implement national mitigation plan for energy sector	100,000
Promote adoption of clean technologies by industry, in particular in the small and medium sector, through regulatory and fiscal measures, and standards setting	50,000
Develop and implement a Policy framework and a National Adaptation Programme of Action (NAPA) to adapt to climate change in most vulnerable sector to anticipated climate change	100,000
Strengthen the capacity of climate change unit to handle climate change issues	300,000
Provide training to national staff on GHG inventories and clean technology	200,000
A database on climate change and web page	50,000
TOTAL	870,000

PROJECT PROFILE (4)

Project Title	: Strengthening Environmental Monitoring and Disaster Preparedness
Implementing Agency	: EPA
Collaborative Agencies	: Research Institutions, Civil Defense, CAMA, MWE, MSRA, MFW, MAI, and MEE
Estimated Budget	: US\$ 510,000
Time Frame	: Four years
Sources of Finance	: Funding Agencies

RATIONALE

There are several humanitarian and environmental challenges that are impeding Yemen's progress towards achieving the Development Goals (DGs). These challenges range from flash floods, earthquakes, landslides and the spread of diseases.

In response, the Disaster Preparedness, Management and Recovery project is aiding the Government in overcoming these challenges. Climate-related floods and droughts pose a serious threat to national economies and sustainable development. Over the past decade, Yemen has faced frequent flash floods resulting in wide spread loss of agricultural land, loss of life and livestock in addition to destruction of country infrastructure. Under warmer climate the intensity and frequency of droughts and flashfloods is likely to increase, causing more threats to the country population and natural resources.

To minimize impacts of such extreme events on vulnerable sectors and communities, there is a need to develop risks management adaptive capacity of Yemen through establishing disaster monitoring and predicting center equipped with modern weather prediction and warning system to provide vulnerable sectors and communities with the necessary information to save people's life and their properties.

STRATEGIC GOAL

Promoting the transfer and application of science and technology in the management of natural resources, and monitoring of causes and consequences of man-hazards and natural disasters on natural resources.

OBJECTIVES

1. To build institutional and technical capacity so that improving disaster planning and management at national and district levels.
2. To develop and strengthen the nation's preparedness capacity for safeguarding vulnerable communities through the transfers of state of art technology.

ACTIVITIES

- Promote satellite based for monitoring natural resources, including monitoring extreme weather events such as and drought cyclones, and floods rains... etc.
- Establish information systems, including networks, application and expansion of GIS systems (EPA, GDFCD, AREA, MEE, MSRA, NWRA and CAMA).
- Develop adequate networks for observation and monitoring of environmental variation (NWRA and CAMA).
- Develop capacity of Meteorological department in weather monitoring and predictions of extreme weather events (CAMA).
- Establish database to be accessible to public.

EXPECTED RESULTS

- Reduced level of human and animal death as a result of introduction of early warning system.
- Smooth flow of environmental information between institutions.
- Well-equipped research centers to deal with natural disaster risks.
- Better understanding and knowledge on causes and impact of natural disasters.

INDICATORS

- An early warning satellite-based system for monitoring flood and extreme weather events installed and implemented in CAMA.
- Adequate and representative hydro meteorological networks for monitoring weather variable established in CAMA and NWRA.
- A satellite based system for monitoring land slides, change in land area and forest installed and implemented in AREA, and NEIC.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Promote satellite based for monitoring natural resources, including monitoring extreme weather events such as floods and drought	300,000
Develop capacity of Meteorological department in weather monitoring and predictions of extreme weather events (CAMA)	120,000
Install a satellite based system for monitoring land slides and change in land area and forest	50,000
Establish database to be accessible	40,000
TOTAL	510,000

PROJECT PROFILE (5)

Project Title	:	Developing Management Performance of Environmental Agencies
Implementing Agency	:	EPA, GDFCD
Collaborative Agencies	:	MWE, MAI, NWRA, MCS
Estimated Budget	:	US\$ 1,575,000
Time Frame	:	Three years
Sources of Finance	:	Funding Agencies and Government

RATIONALE

National agencies are lacking fully adequate effective coordinating mechanism and there is no one agency has the mandate to harmonize the development of policies, strategies and sectoral plans dealing with environment issues. This deficiency results in the existence of number of fragmented, feeble and overlapping policies and plans, which have low potential to be effective and generally have little impact in reducing burden pressures on natural resources.

Similarly, the existing national legislation in the Republic of Yemen has evolved in an ad hoc fragmented manner, leading to increased potential for overlapping jurisdictions, and weak enforcement of the said laws. In addition to laws inadequacy, there are number of antiquated laws, by laws, and regulations and these outdated legislations have been cited responsible for unclear mandates and mission of designated environmental entities, creating confusion, lack of trust, and long lasting dispute among these bodies over their mandates, role and responsibilities.

The reasons for legislation not being enforced are multiple, including in sufficient staffing capacity of the department in charge with the enforcement of law. Enforcement procedures of existing legislation are not clear and the capacity for their execution almost non-existent. Enforcement of legislation has been further constrained by the lack of other systems level resources such as human, financial and technological resources.

Agencies responsible for monitoring regulations are often severely constrained by manpower and have little or no training in legal procedures such as the chain of custody.

Yemen public administration suffer from inexistence of a staff evaluation system coupled with lack of job descriptions, and difficulty to apply fair criteria and benchmarks for staff appraisal and promotions. These constraints are triggered by uncompetitive salary scales causes high rate of brain drain. In addition there are no proper delegation of authority, or any system for communication and management of information among the staff or any effective internal monitoring systems for staff presence or performance.

STRATEGIC GOAL

Rationalization of legislative and regulatory frameworks for effective environmental protection.



OBJECTIVES

1. To streamline internal structures of environmental agencies.
2. To strengthen environmental management through integrated and participatory management of natural resources at central and local level.
3. To strengthen manpower performance through systematic capacity building and motivation.
4. To strengthen law enforcement through updating and harmonizing environmental laws.
5. To strengthen enforcement capacity of EIA.

ACTIVITIES

- Review and harmonize mandates of relevant agencies (EPA, GDFCD).
- Review and amend organization structure and job description of relevant agencies (EPA and GDFCD).
- Prepare by-laws internal operation system.
- Promote participation of local authorities, community-based groups and private sector in environmental management.
- Create appropriate coordination bodies for management and use of natural resources.
- Prepare by laws for smooth functioning of the coordination committees.
- Gap assessment of manpower.
- Establish national data base for human resources.
- Training needs assessment.
- Prepare human development strategy and recruitment plans to fill the gaps.
- Implement capacity building programs.
- Provide adequate financial and material resources for MEAs focal points.
- Establish staff performance and control/appraisal system for the public administration.
- Enforce fair and competitive salary scale.
- Develop employment policy.
- Delegate responsibilities to local levels.
- Establish an effective coordination mechanism for revival, integration and enforcement of environmental laws.
- Review and identify duplication and gaps of environmental laws.
- Institutionalize the promotion of community-based planning model in planning and management of natural resources nationwide.
- Enact local council law No. 4 by creating effective local management structures of natural resources.
- Subject overall development projects, programmes to EIA.
- Establish and enact by-laws penalizing EIA violation.
- Create branches for (EPA) in major agro ecological zones.
- Build the capacity of EIA unit of EPA on EIA development and enforcement.

EXPECTED RESULTS

- Mandates, role, and responsibilities of environmental agencies harmonized.
- Organization structures, job descriptions, by-laws /internal operation for environmental agencies clarified.
- Enhanced relationships among environmental actors for enforcement of natural resource laws and policies.
- Effective delivery of environmental laws and policies due to enactment of agreed-upon inter-institutional collaboration mechanisms.
- Maximum resources ensured for implementation cross-cutting issues.
- Increased advocacy for MEA issues and sensitization of the private sector on their role in implementation of MEAs.
- Adequate manpower and expertise ensured for effective environmental management.
- Brain drain to outside country halted by government based on fair salary scale and good governance.
- Legislation inadequacies and gaps reduced by passing new laws and by-laws where needed.
- Environmental laws adequately harmonized and enforced as a result of enactment of law enforcement mechanism and supports societal and organizations.
- Adequate infrastructure and human resources granted for EPA for EIA enforcement.
- Reduced pressures on environmental resources as a result of enforcement of EIA regulations.

INDICATORS

- Government mandates and roles of environmental sector harmonized.
- Updated organizational structures and job descriptions of EPA, GDFCD, Met Department, and MAI approved by government.
- Internal working relations of MEAs focal points clearly defined and functioning.
- A cross-sectoral mechanism for integrated water management established and implemented.
- A mechanism for coordinating land use is in place.
- A mechanism for monitoring the deterioration of land resources established under AREA.
- A coordination mechanism for biodiversity management implemented at EPA.
- Number of sites community-based coordination mechanism created for wetlands management/ use.
- A management unit for controlling of invasive species created at EPA.
- Establishment decrees for each coordination mechanism declared and enforced.
- Three database systems for human resources are implemented at EPA, GDFCD and AREA.

- Human development strategy formulated and executed by MEAs focal points.
- Performance and control appraisal system for the public administration.
- New fair salary scale adopted by the government.
- Number of decentralized management models of nature reserves created and implemented at district levels.
- An effective mechanism for water law enforcement established and implemented under NWRA umbrella.
- Mechanism for monitoring violation of fishing laws established and implemented under ministry of fishery and marine resources.
- Forestry and combating desertification laws passed by government.
- Bylaws of forest laws approved and enforced.
- Legislations for controlling of alien invasive species passed and enforced.
- Bylaw regulating fishing and use of proper fishing gears developed and enforced.
- By 2010, at least ten community-based management structures created and implemented in EPA management, rangelands, and fishery.
- By 2010, legal frameworks for community participation in the development and use of range resources established and implemented in at least in five rangelands, five fisheries and five protected areas.
- EIA by-laws and procedures enforced on overall development projects.
- Adequate branches for EPA created in several governorates.
- EPA staff adequately trained on EIA development and enforcement.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Review and harmonize mandates relevant agencies (EPA, GDFCD)	100,000
Review and amend organization structure job description relevant agencies (EPA, GDFCD)	30,000
Prepare by-laws /internal operation system	10,000
Establish specialized unit to monitor introduction and spread of invasive species at EPA and train the national staff	150,000
Create appropriate coordination bodies for management and use of natural resources	90,000
Number of decentralized management models of nature reserves created and implemented at district levels	150,000
Prepare human development strategy	60,000
Establish staff performance and control/appraisal system for the public administration	100,000
Two database systems for human resources are implemented at EPA and GDFCD	50,000
Establish an effective coordination mechanism for revival, integration and enforcement of environmental laws	115,000
Update and harmonize of environmental laws	70,000
Promotion of Community-based planning model in the management of natural resources nationwide	100,000
Enact local council law No. 4 by creating effective local management structures of natural resources	100,000
Establish and enact by-laws penalizing EIA violation	50,000
Create branches for (EPA) in major agro ecological zones	200,000
Build the capacity of EIA unit of EPA on EIA development and enforcement	200,000
TOTAL	1,575,000

PROJECT PROFILE (6)

Project Title	:	Conservation and Sustainable Use of Biological Resources
Implementing Agency	:	EPA
Collaborative Agencies	:	MAI, AREA, GDFCD, MSRA
Estimated Budget	:	US\$ 800,000
Time Frame	:	Five years
Sources of Finance	:	Donor Agencies

RATIONALE

Biodiversity plays an important role in sustainable development. Conservation and rehabilitation of genetic biodiversity and endangered species have to be supported and encouraged to gain environmental, social and economic benefits.

The biodiversity of Yemen is being drastically reduced by the rapid degradation of the environment as a result of desertification, drought and other human influences. Most endemic and rare or endangered species are exposed to extinction. Moreover, the overall developmental policy and/or actual direction of development in the country have ignored the environmental consequences of changes.

The number of rare or endangered species and habitats loss are increasing drastically year after year which can be attributed to many environmental and human influences due to the absence of adequate legislations, regulations and laws protecting critical habitats and natural resources for the sustainability of country's biodiversity.

Institutions directly related to biodiversity management and conservation have no adequate capacity to conserve and rehabilitate genetic biodiversity & endangered species.

STRATEGIC GOAL

Promote the conservation and rehabilitation of genetic biodiversity and endangered species.

OBJECTIVES

1. To implement recovery and rehabilitation plans.
2. To establish and operate a comprehensive national ex situ and in situ genetic conservation system.
3. To develop guidelines on collection, maintenance and reintroduction of plants and animal species.
4. To train Professionals for conservation and management of biodiversity.

ACTIVITIES

- Formulate a national policies for the protection of flora, fauna and their habitats.
- Promotion of the conservation and development of protected areas through the formulation and implementation of management plans.
- Establishment and maintenance of data bases on plants, animals and protected areas.
- Assessment of the status and trends of wildlife and habitat conservation.
- Identify, map, and prioritize areas of threatened endemic species.
- Develop guidelines for collection, maintenance and reintroduction of plants and animal species in ex-situ programmes.
- Adopt measures to prevent unsustainable harvesting.
- Research and surveys on endangered flora and fauna.
- Prepare and implement recovery and rehabilitation plan for threatened plant and animal species.
- Assessment and management of ex *situ* crop and fodder plant genetic resources.
- Development and strengthening capacity for *ex-situ* conservation through the establishment of gene banks, seed banks, national herbarium, natural history museum and public gardens.
- Formulation of relevant instruments to govern accessibility to crop plant genetic resources.
- Support for *in situ* conservation of plants species in selected nature reserves.
- Set up and conducting training programs in out-situ conservation.

EXPECTED RESULTS

- Endangered species protected through number of ex-situ and in-situ conservation measures.
- Well-equipped institutions to recover and rehabilitate threatened flora and fauna.
- Adequate and reliable information base generated for the sound planning and management of biological resources.

INDICATORS

- By 2008, Yemen red list of endanger species published.
- By 2015, recovery and rehabilitation plans prepared and implemented.
- By 2010, number of gene banks, seed banks, and public gardens established.
- A comprehensive national ex situ and in situ genetic conservation system established and operational.
- By 2015, the national herbarium and natural history museum established.
- Guidelines on collection, maintenance and reintroduction of plants and animal species developed and used.
- Professionals trained for conservation and management of biodiversity.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Identify, map, prioritize areas of threatened endemic species	50,000
Prepare a red list of endanger species	20,000
Prepare recovery and rehabilitation plan for threatened plant and animal species	120,000
Establish gene banks, seed banks	200,000
Establish national herbarium, natural history museum	100,000
A comprehensive national ex situ and in situ genetic conservation system	50,000
Assessment of the status and trends of wildlife and habitat conservation	40,000
Formulation of relevant instruments to govern accessibility to crop plant genetic resources	10,000
Assessment and management of ex situ crop and fodder plant genetic resources	50,000
Facilitate training at national and local level in biodiversity conservation and management	100,000
Guideline on collection, maintenance and reintroduction of plants and animals species	10,000
Establishment and maintenance of data bases on plants, animals and protected areas	50,000
TOTAL	800,000

PROJECT PROFILE (7)

Project Title	:	Stimulation of Integrated Researches on Natural Resources
Implementing Agency	:	EPA
Collaborative Agencies	:	MWE, MEE, AREA, GDFCD, NWRA, MSRA
Estimated Budget	:	US\$ 1,020,000
Time Frame	:	Three years
Sources of Finance	:	Donor Agencies and Government

RATIONALE

Better and more comprehensive understanding of the state and trends of environmental variables and of their causes is most important for implementing sound environmental strategies, that keep natural resources use within the limits of each respective resource. Recognizing this fact and recalling that research institutions have inadequate capacity to produce informative research for this purpose. It is crucial to enable national institutions promoting integrated research on natural resource with aim to visualize and providing clearer insights on environmental status for policy makers so that they can produce sound environmental strategies.

To put into effect integrated research in this scale, there is an urgent need for improved information base, skilled expertise, and improved systems for environmental monitoring including man-made and natural disasters. Through the set-up of research coordinating committee, research website, and information networks between key research institutions, it is anticipated to result into creating effective working environment for conducting and disseminating objective researches to public, which in turn will enhance the public knowledge on the state and trends of environmental variables and of their causes, leading to better environmental management.

STRATEGIC GOAL

Streamlining research effort to improve understanding of the natural resources capacity to deliver goods and services and support livelihoods of Yemeni people sustainably.

OBJECTIVES

1. To stimulate integrated research on natural resource.
2. Strengthening information base and free flow environmental information.
3. Promoting the transfer and application of knowledge, science and technology in the management of natural resources and energy use.

ACTIVITIES

- Experts committee for coordinating integrated research.
- Initiate researches on, rare and endangered species and their habitats.
- Undertake stock assessment studies for the living marine resources.
- Research to quantify and forecast the response of genotypes, species, habitats, ecosystems and landscapes under anticipated climate change.
- Develop methodologies for adaptation and conservation policies.
- Assessment on needs to adapt and mitigate climate change.
- Assessment needs for mitigating impacts of earth quake, land slides and industrial accidents.
- Develop flora, fauna, and marine inventories.
- Provide funds and infrastructure for research institutions to develop research programs in the target areas.
- Conduct forest, range, soil and desertification surveys.
- Support traditional and environmentally sound land use practices.
- Establish environmental communication units in relevant environmental agencies.
- Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information.
- Promote research on renewable and alternative energy.
- Revive and apply traditional knowledge, innovation and good practices in environmental management.

EXPECTED RESULTS

- Research outputs widely disseminated and used in planning and management of natural resources.
- Better knowledge and understanding of available environmental resources and their capacity to provide goods and services.

INDICATORS

- Better understanding and knowledge on biodiversity components and ecosystems.
- Comprehensive database on flora and fauna, alien invasive, coastal/marine habitats, and conservation needs developed and accessible.
- A gene bank for seed conservation developed and implemented in AREA.
- Reliable methodologies for adaptation and conservation policies formulated and widely applied.
- Best traditional knowledge on herding practices and rotational use of ranges documented and applied.
- State of arts and new techs on rational water uses for irrigation, households, and industry transferred and applied.
- Reliable knowledge on state of desertification, forestry and land use produced and accessible.

Final Report and Action Plan for Environmental Capacity Development

- Traditional knowledge, innovation, and good practices documented and applied in the management and use of, rangelands, forest, wetlands, coastal lands, fisheries and water resources.
- State of arts technologies on renewable energy applications documented and applied in mitigating GHG emissions.
- Five database systems in research centers established.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Experts committee for coordinating integrated research	20,000
Initiate researches on, rare and endangered species and their habitats	50,000
Initiate research to quantify and forecast the response of genotypes, species, habitats, ecosystems and landscapes under anticipated climate change	100,000
Develop flora, fauna, and marine inventories	50,000
Conduct forest, range, soil and desertification surveys	100,000
Provide national experts with specialized training on: biodiversity assessment, climate modeling... etc	50,000
Provide funds and infrastructure for research institutions to develop research programs in the target areas	200,000
Develop comprehensive database	100,000
Establish a gene bank for seed conservation at AREA	50,000
Revive and apply traditional knowledge, innovation and good practices in environmental management	70,000
Formulate and apply reliable methodologies for adaptation and conservation policies	50,000
Enhance research skills on climate modeling, climate scenarios and projection of GHG emissions	50,000
Apply new technology on rational water uses for irrigation, households and industry	30,000
Five database systems in research centers	100,000
TOTAL	1,020,000

PROJECT PROFILE (8)

Project Title	: Streamlining Yemen Environmental Policy Towards Integrated Planning and Management of Natural Resources
Implementing Agency	: MPIC
Collaborative Agencies	: EPA, MAI, MEE, MFW, GDFCD, AREA, MWE, CAMA
Estimated Budget	: US\$ 3,155,000
Time Frame	: Four years
Sources of Finance	: Donor Agencies and Government

RATIONALE

Under current policy setup, Yemen environmental policies are weakly integrated and environmental concerns as well as the local community needs are inadequately addressed by the national development policies. To resolve this policy deficit the NCSA action plan identifies a number of interventions and measures, which are mainly oriented to enable national and local partners to integrate physical, socio-economic and environmental factors in the formulation of public policies and in the national and district development plans.

Yemen environmental policies are generally developed under weak inter-institutional coordination, which cause conflict of interests and lead to weak enforcement of such policies. Conservation of the environment, however, requires the participation of multiple stakeholders, who may bring to bear their respective resources, competencies, and perspectives for full implementation of environmental policies. Exclusion of local community in planning natural resources and policy development generally results in ignorance of local people needs and marginalization of those communities who bear most of the cost of environment protections. This in turn leads to negative attitude towards environmental protection initiatives and hence to failure in attaining their objectives in environmental protection. Furthermore, the ignorance of local people needs while developing environmental policies further deprive poverty level among poor causing excessive pressure on natural resources. On the other hand, decentralized management has been proved to be ineffective as regards conservation and protection of environment, particularly when it ignores the concerns of local communities.

Yemen capacity to mobilize adequate resources for effective delivery of environmental policies is generally weak. The ability to access financial resources from international donor agencies is constrained by poor policy makers' knowledge on UN conventions, their funding mechanisms, and eligibility criteria for funding from these mechanisms. This situation is further hampered by a weak information base for policy development, poor expertise in project and strategy formulation, lack of networking, and weak scientific and technical cooperation with international agencies.

STRATEGIC GOAL

Strengthening the performance of environmental policies through the promotion of participatory national and local planning of natural resources.

OBJECTIVES

1. To integrate environmental concerns in policies, plans, programmes, and projects for economic and social development.
2. To promote participatory national planning of natural resources.
3. To strengthen local community involvement in planning the protection of environmental resources.
4. To mobilize adequate resources for policy execution.

ACTIVITIES

- Study and review policies.
- Develop and enact a common guidelines for mainstreaming Environmental issues in the national and district development plans.
- Readjust national and local development plans and strategies to account for environmental issues, livelihoods of local communities and global commitment.
- Develop and promote participatory mechanism for developing and implementing integrated land and water use plans, including integrated watersheds, marine and coastal area management.
- Restructure environmental policies to meet international needs and sustainable management and use of natural resources.
- Identify and enact an inter-institutional coordination mechanism for integrating and implementing environmental policies.
- Promote community-based planning model over management of natural resources.
- Develop and implement livelihoods programs for the local community.
- Promote sustainable livelihood approaches in the management of natural resources including the establishment of nature reserves.
- Implement training programs to improve capacity of policy makers in developing environmental strategies and plans.
- Provide training on resource mobilization from various international donation sources.
- Provide training to improve negotiation skills of policy makers.
- Train Environmental staff on planning and Project formulations.
- Provide financial and technical support to community environmental action, including the livelihoods of local communities.
- Secure adequate funds from government and donors to implement community action plans and programmes.
- Develop and implement livelihoods programs for the local community.
- Promote sustainable livelihood approaches in the management of natural resources including the establishment of nature reserves.

EXPECTED RESULTS

- Guidelines for mainstreaming environmental issues into the national and district development plans.
- National environmental policies harmonized in line with Yemen MDGs, national priorities, and MEAs requirement.
- Integrated management approaches widely applied in natural resources planning at both national and district levels.
- A nationwide societal partnership in planning and management of the natural resources.
- Mobilization of optimal resources from all sectors of society.
- Increased government- public trust, and good governance in natural resources management as a result of government-community partnerships.
- Enforcement of local council law No. 4 as results of shifting to community-based planning model in managing natural resources.
- Significant change in community attitudes towards environment as a result of moving to decentralized management in protected areas, rangeland and coastal zones.
- The livelihoods of local community adequately considered when protecting nature reserves.
- Indigenous knowledge widely applied in management of natural resources.
- Better articulation of environmental policies as a result of enhanced capacity on strategic planning and enhancement of information base.
- More accessible resources for implementation of environmental policies due to increased policy makers' awareness on MEAs conventions and their eligibility requirements for funding MEAs projects.

INDICATORS

- BY 2010, five integrated forest management plans formulated and implemented in Bura'a, Hawf, and Socotra.
- BY 2010, four integrated range management plans formulated and implemented.
- At least six watershed management plans implemented.
- BY 2010, at least six integrated marine and coastal management plans implemented in the Arabian Sea, Red sea and Socotra Island.
- At least twelve, fisheries management plans implemented.
- Yemen wet lands use policies formulated and approved.
- By 2010, management plans for Aden wetlands, Al-Luhaia, Guriara and Kamaran implemented.
- Policies and land use and land tenure formulated and applied.
- A national plan on control and use of alien invasive species developed and executed.
- By 2010, a rational water use policy formulated and applied for irrigation, households, and industries.
- Guidelines for integrating climatic issues in the land use planning developed and applied.
- By 2010, Yemen Adaptation Programme of Action- on climate change - (YAPA) implemented.

Final Report and Action Plan for Environmental Capacity Development

- A plan for rehabilitation of degraded natural habitats prepared and implemented.
- A plan on for revival of best traditional knowledge of herding practices and rotational use of ranges implemented.
- Four inter-institutional coordination mechanisms for policy development established for land, marine, water and energy sectors, including disaster management.
- By 2012, at least fifteen communities have the power and effectively involved in planning of five nature reserves, five rangelands, and five fishery sites.
- By 2012, at least fifteen community-based management plans implemented in nature reserves, rangelands, and fishery resources.
- Livelihoods programs for the support of local people developed and implemented in five important nature reserves, five rangelands and five fishery areas.
- Adequate resources for meeting MEAs commitments mobilized from funding mechanisms.
- Adequate number of senior staff from EPA and GDFCD trained on developing environmental strategies and action plans.
- Policy makers fully involved in integrating environmental concerns for economic and social development.
- Funds for rehabilitation programs of degraded wet lands secured.
- Fund for implementation of sustainable livelihood approaches in the management of natural resources secured.
- Adequate funds for implementing monitoring and conservation plan of coastal and marine resources provided.
- Rehabilitation plans of degraded natural habitats executed.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Restructure environmental policies to meet international needs and sustainable management and use of natural resources	425,000
Develop integrated plans for MEAs	1,430,000
Develop and implement livelihoods programs for the local community	100,000
Promote participatory national planning of natural resources	200,000
Strengthen local community involvement in planning the protection of environmental resources	400,000
Implement training programs to improve capacity of policy makers in developing environmental strategies and plans	100,000
Provide training on resource mobilization from various international donation sources	100,000
Improving negotiation skills of policy makers	100,000
Develop and implement sustainable livelihood approaches in the management of natural resources including the establishment of nature reserves	300,000
TOTAL	3,155,000



PROJECT PROFILE (9)

Project Title	:	Data and Information Collection, Dissemination and Monitoring
Implementing Agency	:	EPA
Collaborative Agencies	:	MPIC, GDFCD, AREA, MEE, MSRA, NAWRA, CAMA, and Universities
Estimated Budget	:	US\$ 800,000
Time Frame	:	Three years
Sources of Finance	:	Donor Agencies and Government

RATIONALE

Availability and accessibility of reliable information is a prerequisite for developing sound environmental policies as well as enhancing outcomes of environmental researches. In addition, data availability and accessibility is critical for producing effective awareness programs. This project, therefore, is designed to address data shortage and inaccessibility through a wide range of policies and instruments. To enhance overall information quality, this project calls for standardization of data collection, processing and analysis formats. Furthermore, this project emphasizes on providing training to media and communication units' personnel on newly introduced facilities, and on data acquisition, processing, production and dissemination of awareness materials. To improve public awareness on environmental issues, special training programs for mass media practitioners/reporters will be provided.

There are several humanitarian and environmental challenges that are impeding Yemen's progress towards achieving the Development Goals (DGs). These challenges range from flash floods, earthquakes, landslides and the spread of diseases.

Over the past decade, Yemen has faced frequent flash floods resulting in wide spread loss of agricultural land, loss of life and livestock in addition to destruction of country infrastructure. Under warmer climate the intensity and frequency of droughts and flashfloods is likely to increase, causing more threats to the country population and natural resources. To minimize the impacts of extreme events on vulnerable sectors and communities, there is a need to develop risk management adaptive capacity of Yemen through establishing modern weather prediction and warning system to provide vulnerable sectors and communities with the necessary information to save people's life and their properties.

STRATEGIC GOAL

Strengthening information base and free flow environmental information.

OBJECTIVES

1. To ensure information sharing between line institutions and international agencies.
2. To improve capacity of policy makers in developing environmental strategies and plans.
3. To raise awareness of public and policy makers on sustainable use of natural resources and environmental protection.
4. To develop and strengthen the nation's preparedness capacity for safeguarding vulnerable communities through the transfers of state of art technology.

ACTIVITIES

- Conduct needs assessment study for improving data collection processing, retrieval and dissemination.
- Formulate ICT development strategy for MEAs focal points and research institutions.
- Establish environmental communication units in relevant environmental agencies.
- Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information.
- Train staff of media and communication units on data acquisition, processing and production and dissemination of awareness materials.
- Carryout inventories of environmental, resource and development data for determining gaps and organizing activities to fill those gaps.
- Develop and assessment framework.
- Establish systems to verify quality of data gathered, i.e., a source check.
- Establish procedures for measurement and evaluation.
- Organize continuous and accurate data-collection systems, making use of GIS, databases, expert systems, models.
- Establish information systems, including networks, application and expansion of GIS systems (EPA, GDFCD, AREA, MEE, MSRA, NWRA and CAMA).
- Provide training on GIS systems and networking (EPA, NEIC, GDFCD, AREA, MEE, MSRA, NAWRA and CAMA).
- Capacity building through providing appropriate training on various environmental disciplines, including training on newly introduced technologies and monitoring equipments (EPA, GDFCD, AREA, MEE, MSRA, NWRA and CAMA).

EXPECTED RESULTS

- Free flow of information between environmental agencies.
- Information gaps and uncertainty reduced.
- The MEAs focal points and research centers fully equipped with up to date ICT and data management technologies.

INDICATORS

- National environmental information center established.
- ICT development strategy formulated for Focal points and research centers.
- Four environmental communication units established at EPA, GDFCD, AREA, NWRA, and MSRA.
- Communication units equip with networks and systems for the data acquisition, processing and dissemination of environmental information.
- Train staff of media and communication units on data acquisition, processing and production and dissemination of awareness materials.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
ICT development strategy formulated for Focal points and research centers	20,000
Establish National Environmental Information Center	150,000
Established four environmental communication units at EPA, GDFCD, AREA, NWRA, and MSRA	200,000
Equip communication units with networks and systems for the data acquisition, processing and dissemination of environmental information	100,000
Train staff of media and communication units on data acquisition, processing and production and dissemination of awareness materials	50,000
Remote sensing and database/GIS systems	150,000
Training program for NEIC staff	50,000
Training EPA, GDFCD staffs in report writing and information gathering	30,000
Establish database to be accessible to public	50,000
TOTAL	800,000

PROJECT PROFILE (10)

Project Title	: Sustainable Land Use Management
Implementing Agency	: MAI, GDFCD
Collaborative Agencies	: AREA, EPA, and MWE
Estimated Budget	: US\$ 820,000
Time Frame	: Five years
Sources of Finance	: Donor Agencies and Government

RATIONALE

There is a need to develop an understanding of the significance of desertification and to ensure public participation in management and planning of land resources. The country capacity to monitor and understand desertification impacts needs to be improved through establishment of development of meteorological and hydrological networks, improvement of the climatologically data base and enhanced research and assessment of climate and desertification aspects, including droughts. Introduction of environmentally sound methods & practices, including revival of indigenous techniques with regard to farming, terraces maintenance, agroforestry and rang management is of great importance to prevent the advance of desertification and, to reclaim decertified land for productive use. The project gives due attention for implementation of a long-term Programmes, involving afforestation, agroforestry, terraces rehabilitation, dune and wadi bank stabilization, shelters belts, greenbelts windbreaks, and watershed management and protection.

STRATEGIC GOAL

Promoting sustainable land use management plans and practices.

OBJECTIVES

1. To reduce the negative impacts of the desertification in a participatory manners with the local communities.
2. To reduce agricultural land losses.
3. To create suitable environment of livelihood activities and to improve the living conditions.

ACTIVITIES

- Mobilize resources for updating and implementation of the NAPCD.
- Revival and application of traditional systems terraces and rangelands conservation and in water sheds.
- Promoting the use of natural fertilizer in replacement of imported agrochemicals.
- Promoting the integrated pest management techniques.

Final Report and Action Plan for Environmental Capacity Development

- Establish rangelands development center in forestry department.
- Implement number of pilot projects on terrace rehabilitations, desertification, and of rangeland conservation implemented.
- Establish green rings built in four main cities, and number of wind shelters in at least four critically deforested areas.

EXPECTED RESULTS

- Reclamation of fragile ecosystems for productive use based on revival and application of good practices.
- Prevention of further desertification and land deterioration through Afforestation, agroforestry and sand dune fixation programmes.
- Improve country adaptation and preparedness for mitigating potential impacts of drought and extreme weather events.

INDICATORS

- Number of traditional systems applied in terraces, rangelands water sheds management.
- NAPDC updated and implemented.
- Green rings built in four main cities, and number of wind shelters established in at least four critically deforested areas.
- Integrated pest management techniques widely farms management.
- Quantity of natural fertilizer use increased and level of agrochemical fertilizer import reduced.
- Number of pilot projects on terrace rehabilitations, desertification, and of rangeland conservation implemented.
- Rangelands development center implemented in forestry department.

ESTIMATED BUDGET

ACTIVITIES	AMOUNT (US \$)
Updating implementing of the NAPCD	200,000
Rangelands development center in forestry department	100,000
Promoting the integrated pest management techniques	50,000
Number of pilot projects on terrace rehabilitations, desertification, and of rangeland conservation	100,000
Promoting the use of natural fertilizer e in replacement of imported agrochemicals	50,000
Green rings built in four main cities, and number of wind shelters established in at least four critically deforested areas	300,000
Revival and application of traditional systems terraces and rangelands conservation and in water sheds management	20,000
TOTAL	820,000

7.5 Annex (5): Past and On-going Environmental Projects:

Project \ Plans	Funded by	Aim
National Environmental Action Plan (NEAP), 1996 - 2000	Yemen Gov.	Promotes sustainable use of natural resources through a set of policy options in addressing priority issues.
The Poverty Reduction Strategy Paper (PRSP), 2003 - 2005	Yemen Gov.	The plan reinforces sustainable management of natural resources, mobilize beneficiaries, involve the poor and support the role of women and youth in environmental conservation.
Environment and Sustainable Development Investment Programme (ESDIP), 2003 - 2008	Yemen Gov.	The plan presents an outline strategy and priority interventions aimed at controlling and gradually reversing environmental impacts. It also aims at supporting sustainable human development for the people of Yemen.
Country Cooperation Framework (CCF), 2002 - 2005	UNDP	Provide sustainable natural resources management and promote the integration of environmental management with national development policies and programmes.
National Programme on Integrated Water Resources Management, YEM\03\013 (NPIWRM), 2003 – 2008	UNDP- Yemen Gov.	Provide a comprehensive response to water management issues in Yemen with the objective to alleviate poverty and secure basis for sustainable development.
Sustainable Development and Biodiversity Conservation for the People of Socotra Island, YEM\03\004 (SDBCPSQI), 2003 – 2008	UNDP- Yemen Gov.	Support human development for the people of Socotra islands, through the conservation and sustainable use of its unique biodiversity and natural resources.
National Recovery and Recycling Programme for Refrigerators in the Commercial and MAC Sectors in Yemen, YEM02\G61 (NRRPR), 2002 - 2005	GEF	Implement a comprehensive national programme for recovery and recycling of refrigerants in the refrigeration and air-conditioning sub-sectors according to the refrigerant management plan.

Project \ Plans	Funded by	Aim
GEF Small Grant Programme (GEF SGP), 2004	GEF	Deliver global environmental benefits in the area of biodiversity conservation, climate change mitigation, protection of international waters, prevention of land degradation (primarily desertification and deforestation), and elimination of persistent organic pollutants through community based approaches.
National Adaptation Programme of Action, YEM/03/G37 (NAPA), 2003 - 2004	GEF	Broadly communicate to the international community priority activities that address Yemen's urgent needs for adapting to the adverse impacts of climate change.
National Biodiversity Strategy and Action Plan, YEM/96/G31 (NBSAP), 1997 - 2004	GEF	Assist the government in development of a national biodiversity strategy and action plan.
Protection of the Marine Ecosystems of the Red Sea Coast Yemen, YEM/97/G32 (PERSC), 1997 - 2004	GEF	Protection of the Marine Ecosystems of the Red Sea Coast of Yemen.
UN-Nexen Water Resources Management, Community Water Supply and Sanitation in Masila, Hadhramaut "The Ressib Water and Sanitation Project", YEM/03/005 (UN-NEXEN WRM CWSS), 2003 – 2006	UNDP-NEXEN	Develop a model for long-term stewardship of water and sanitation services at the community level within the Masila Region of Hadhramaut Governorate.
National Capacity Building for Natural Resources Management (NCBNRM), 2004 - 2008	UNDP	Strengthen the performance of environmental protection and national poverty alleviation policies, to build capacities of central and local level institutions on integration of environmental and sustainability issues within the district development process, to enhance awareness at the local and policy making levels and to promote sustainable livelihood approaches in management of natural resources including establishment of nature reserves.

Project \ Plans	Funded by	Aim
National Capacity Self-Assessment (NCSA), 2004 – 2005	GEF	Identify and determining the nature of capacity constrains faced by the country to respond to the global conventions and ways to address these constraints.
Assistance to the Government of Yemen to Coordinate and Monitor Implementation of Poverty Reduction Initiatives, YEM/03/001 2003 – 2007	UNDP	Incorporating environmental assessment, social participation and the consideration of sustainability issues with poverty reduction strategy.
Decentralization and Local Development Support Programme, YEM/03/008 2004-2007	UNDP	A pilot intervention, which is expected to develop into a major programme to support national strategy for implementation of decentralization reform.
Sustainable Development and Biodiversity Conservation for the People of Socotra Islands, YEM/03/004 July 2003 – June 2008	UNDP	The programme gives equal weight to biodiversity conservation requirements and developments of Socotra, through supporting the main engines of growth for the local economy, addressing most pressing basic community development needs and enhancing the professional capacities of the local government to steer the path of sustainable development.
National Programme for Integrated Water Resources Management, YEM/03/013 May 2003- 30 April 2003	UNDP	The programme gives equal weights to planning of water basin management and implementation of these plans through establishment of water basin communities ensuring the participation of the local councils and communities in management of water basin in their area.
National Capacity Building for Natural resources Management July 2004 – June 2007	UNDP	Support environmental management both at upstream and downstream levels.

List of GOV Existing Agriculture and Development Projects

1) Projects Funded by Loans

Project \ Plans	Funded by	Aim
Southern Rural Development Project, 1998-2005	Loan, & IDA	- To develop local community and enhance people livelihood in rural areas.
Irrigation Improvement Project, 2001-2007	Loan, & IDA	- To enhance water use efficiency. - Increase Agri. production and enhance beneficiaries' income.
Raimah Rural Development Project, 1998-2007	Loan, & IDA/IFAD	- To find out sustainable infrastructure and services. - To improve livelihood situation of the people.
Al-Mahrah Rural Development Project, 2001-2007	Loan, IDA/IFAD	- Support self development for rural communities. - Enhance family income. - Suitable use of available natural resources. - Improve social infrastructure and services. - Increase local capacity buildings.
Dhamar Participatory Rural Development Project, 2004-2009	Loan, IFAD	- Strengthening food security for small farmers and increase their incomes. - Participatory development for poor farmers family.
Agri. Cooperation Credit Bank Project., 1991-2005	Loan, Arab Fund	- Support Credit activities for increase Agri. and fisheries production. - Increase farmers and fishermen incomes.
Wadi Hadramout Development Project (2 nd Phase), 1999-2007.	Loan, Arab Fund	- Reclamation of lands. - Increase of Agri. production. - Improve water use efficiency and dams conservation. - Improve and extend Agri. services.
Abyan Integrated Rural Development Project, 1999-2004.	Loan, Islamic Development Bank	- Achievement of integrated Agri. and rural development. - Conservation of water resources, improvement of irrigation tools, provision of clean potable water and land protection.
Groundwater and soil Protection Project, 2004-2009.	Loan, IDA	- Improve water use efficiency. - Increase Ground & surface water through watershed management.
Community Resources Management, 2004-2012	Loan, Arab Fund/IFAD	- Achievement of logistic and sustainable development for rural livelihood levels and insures life access for poor family.

2) Projects Funded by Aids/Subsidies.

Project \ Plans	Funded by	Aim
Agri. Marketing Information Systems Development Project, 2002-2007	Aid, Food Security Program	<ul style="list-style-type: none"> - Decrease marketing risks, adoption of market cost system and decrease of post harvesting loss. - Establish of information systems for Agri. trading.
Small Dams Establishment Project, 2001-2005	Aid, Food Security Program	<ul style="list-style-type: none"> - Support of stored water and providing irrigation water for increase productivity.
Enhancement work for Barquqah and Debashah Constructions Project, 2004-2006	Aid, Food Security Program	<ul style="list-style-type: none"> - Increase of Agri. production. - Setup of stable Agri. settlement. - Enhance family income through upgrade and develop of irrigation systems.
Southern Agri. and Rural Development Project, 1998-2005	Loan, IDA/ IFAD	<ul style="list-style-type: none"> - Support self development for rural communities. - Enhance family income. - Suitable use of available natural resources. - Improve social infrastructure and services. - Increase local capacity buildings.
IDAS Project, 2001-2005	Loan, GTZ	<ul style="list-style-type: none"> - Develop self capacity for groups and public settlements to enable them for acting participation in rural sustainable development.
Coffee Development Project, 2003-2005.	Aid, French foodstuffs Aid	<ul style="list-style-type: none"> - Encourage farmers to settle in their areas and produce cash coffee crop.
Support Woman in Domestic Sheep breeding Project, 2005-2006	Aid, French foodstuffs Aid	<ul style="list-style-type: none"> - Improve poor rural family income through sale of livestock products. - Rise up capacity building of rural woman.
Establishment Greenhouse for Crop Production, 2005-2006.	Aid, French foodstuffs Aid	<ul style="list-style-type: none"> - Improve cash coffee crop plantation by using save water irrigation systems.
Improvement of foodstuffs and Fodders Project, 2004-2006.	Aid, French foodstuffs Aid	<ul style="list-style-type: none"> - Strengthening of foodstuffs concept through encourage rainfed Agri. particularly coffee crop.
Post Harvesting Technology for Coffee Crop, 2005-2007.	Aid, French foodstuffs Aid	<ul style="list-style-type: none"> - Improve livelihood level for poor families through avoid post harvesting losses and improve processes of production, sorting, filling and marketing of coffee crop.

Project \ Plans	Funded by	Aim
Biological control of Coffee Pesticide, 2004-2005.	Aid, French foodstuffs Aid	<ul style="list-style-type: none"> - Biological control of coffee crop pesticide in project area. - Awareness of the farmers for the importance of pursuing integrated control methods.
Organizing of Water Harvesting in Rural Community, 2004-2006.	Aid, French foodstuffs Aid	<ul style="list-style-type: none"> - Improve water harvesting processes in order to provide potable water. - Enhance coffee crop cultivation in 30 villages belong to 3 districts.
Bee breeding and Environment Protection in Socotra Island, 2004-2006.	Aid, Food Security Program	<ul style="list-style-type: none"> - Improve Bee breeding with the objective of increase production at the same time protect the environment of Socotra Island.
Reorganization of Agricultural Sector, 2004-2006.	Aid, FAO	<ul style="list-style-type: none"> - Institutional and organizational Rebuilding of agricultural sector, through proper alternative selection within the pathway of decentralization. - Strengthening the institutional role of Ministry of Agri. through clarifying of functions, responsibilities and relationships with partners (private, cooperative sectors, regional rural agri. development authorities and other offices in the governorates).
Monitoring Residual Impact of Veterinary Medicine in Livestock Production, 2004-2005.	Aid, Agency of Atomic Energy	<ul style="list-style-type: none"> - Monitoring Residual Impact in Milks, Meats and other livestock production.
Feasibility Study of Rural Development Project in Wadi Hagr and Districts of Hadramout Coastal Plain (2 nd Phase) 2003-2006.	Aid, Arab Fund	<ul style="list-style-type: none"> - Carry out of technical and economical feasibility study for the second phase of the project.
Marib Dam and Irrigation Channels (2 nd Phase) 2003-2005.	Aid, Abu Dhabi Dev. Fund	<ul style="list-style-type: none"> - Increase the Agri. irrigated Area and improves the Agri. production as well as enhances livelihood level.
Support Rural Development in the Livestock Areas	Aid, Abu Dhabi Dev. Fund	<ul style="list-style-type: none"> - Improve of Livestock production and poverty reduction within these two pilot areas.

7.6 Annex (6): Tables of Environmental Laws and Bylaws Produced by the Government:

Environmental Laws and Bylaws Produced by the Government	
1	The Environment Protection Law (EPL) No. (26) issued in 1995, it's by law No. (148) in 2000
2	The Water Law No. (33) for 2002
3	The Civil Law issued by a Republican Decree No. (14) of 2002
4	The Agrarian Refer Law No. (27) of 1970
5	Law No. (17) of 1990, concerning the Possession of Agricultural Lands
6	The Prime Minister's Resolution No. (65) of 1991, concerning the implementation of the principles and the general directives for resolving agricultural land disputes in the Southern Governorates
7	The Cabinet of Ministers Resolution No. (192), concerning the principles and the general directives for resolving agricultural land disputes in the Southern Governorates
8	Law No. (21) of 1995 issued by a Republican Decree concerning State Lands and Estates, Law No. (1) of 1995 concerning Ownership for Public Interest
9	Law No. (32) of 1999 on Agricultural and Veterinary Quarantine Regulations
10	Law No. (15) of 1994 on Regulating Ships Registration
11	Law No. (20) of 1999 on Agricultural Seeds and Fertilizer Uses
12	Republican Resolution (<i>Presidential Resolution</i>) by Law No. (37) for 1991, Territorial Sea, the Exclusive Economic Zone (EEZ) and the Continental Shelf
13	Law No. (25) of 1999, Regulating and Handling of Pesticides
14	Law No. (43) for 1997, Regarding amendments to the Republican Resolution by law No. (42) for 1992, concerning the Regulation of Fishing, Living Marine Resources and Their Conservation
15	Republican Resolution by law No. (50) for 1991 on Mines and Quarries
16	Republican Resolution by law No. (11) for 1993 on Protection of the Marine Environment from Pollution
17	Republican Resolution by law No. (12) for 1994 on Crimes and Penalties
18	Republican Resolution by law No. (21) for 1994 on Archeological Heritage
19	Republican Resolution by law No. (22) on Tourism
20	Republican Resolution by law No. (22) for 1991 on Investment and its amendments by law No. (14) for 1995 on Investment
21	Republican Resolution by law No. (20) for 1995 on Urban Planning
22	Republican Resolution by law No. (21) for 1995 on State Lands and Property
23	Republican Resolution by law No. (26) for 1995 on the Protection of the Environment
24	In addition several resolutions issued by the Prime Minister are considered part of the overall legislation. Normally, such resolutions regulate the structure and functions of government agencies. They are considered legal documents as bylaws and regulations. Of relevance to the project are the following Prime minister's resolutions:
25	Prime Minister's Resolution No. (94) for 1990 on the Establishment and Formation of the Environment Protection Council and Stipulation of its tasks

7.7 Annex (7): List of National Consultants:

Biodiversity Team:

Dr. Abdul Wahed Othman Mukered	National Consultant, AREA
Dr. Abdul Rahaman Al-Masoudi	National Consultant, AREA
Mr. Mohammed Abdullah Saad	National Consultant, MSRA
Mr. Salim Mohsen Fadhle	National Consultant, MSRA
Mr. Abdul Hakim Abdullah Rajeh	National Consultant, EPA

Desertification Team:

Dr. Abdul Rahaman Haider	National Consultant, AREA
Mr. Jameel Abdul Samad Al-Emad	National Consultant, GDFCD
Mr. Ali Mohammed Al-Dhameri	National Consultant, GDFCD

Climate Change Team:

Dr. Tawfiq Ali Abdul Latif	University of Sana'a
Mr. Ali Abdullah Al-Dubhani	National Consultant, EPA

Supporting Staff:

Dr. Muhammed A. Kareem Al-Mansoob	University of Sana'a
Dr. Hisham Mohsen Al-Saqqaff	University of Aden
Dr. Mohammed Moghram	University of Sana'a
Ms. Afrah Ali Abu Ghanem	EPA
Mr. Ahmed Abdul Habib Malek	AREA

The Action Plan Prepared by:

Mr. Ali Abdul Bari Al-Ademi	Team Leader
Dr. Tawfiq Ali Abdul Latif	National Consultant

Reviewed & Edited by:

Mr. Gamal A. Al-Harrani
NCSA Project Coordinator

YEMEN NCSA, STRATIGIC OBJECTIVES

- 1. Policy Development and Planning**
- 2. Institutional and Legislative Strengthening**
- 3. Research and Technology Development**
- 4. Rising Environmental Awareness and Education of Yemeni Society**
- 5. Conservation and Sustainable use of natural Resources**
- 6. Sustainable Climate Change and Energy Management**

