

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

ENVIRONMENTAL PROTECTION AUTHORITY

National Capacity Needs Self-Assessment Action Plan

Part I: Stocktaking Report

(Final Report)

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TABLE OF CONTENTS

ACRONYMS	III
ACKNOWLEDGEMENTS.....	V
1. INTRODUCTION AND BACKGROUND	1
1.1. INTRODUCTION.....	1
1.2. BACKGROUND.....	1
1.3. OBJECTIVES OF THE STOCKTAKING REPORT	4
1.4. METHODOLOGY	5
2. OBJECTIVES AND OBLIGATIONS OF THE CONVENTIONS.....	5
2.1 THE RIO CONVENTIONS.....	5
2.1.1. <i>Convention on Biological Diversity (CBD)</i>	5
2.1.2. <i>Cartagena Protocol on Biosafety (CPB)</i>	7
2.1.3. <i>United Nations Convention for Combating Desertification (UNCCD)</i>	8
2.1.4. <i>The United Nations Framework Convention on Climate Change (UNFCCC)</i>	10
2.1.5. <i>The Convention on International Trade in Endangered Species (CITES)</i>	13
2.1.6 <i>The Synergy of the Rio Conventions</i>	17
2.2. CHEMICALS RELATED CONVENTIONS	17
2.2.1. <i>The Vienna Convention and the Montreal Protocol</i>	19
2.2.2. <i>The Basel Convention</i>	21
2.2.3. <i>The Bamako Convention</i>	23
2.2.4. <i>The Stockholm Convention</i>	24
2.2.5. <i>The Rotterdam Convention</i>	25
2.2.6. <i>The Synergy of Four Chemical Conventions</i>	27
3. ETHIOPIA’S LEGAL AND POLICY FRAMEWORK FOR THE IMPLEMENTATIONS ENVIRONMENTAL CONVENTIONS.....	29
3.1. THE CONSTITUTION.....	29
3.2. THE MAJOR POLICY FRAMEWORKS OF ETHIOPIA	29
3.2.1. <i>Agricultural Development-Led Industrialization (ADLI)</i>	29
3.2.2. <i>Sustainable Development and Poverty Reduction Program (SDPRP)</i>	30
3.2.3. <i>Food Security Strategy (FSS)</i>	30
3.2.4. <i>Water Policy and Strategy</i>	31
4. LEGISLATIVE MEASURES TAKEN TO ADDRESS ENVIRONMENTAL PROBLEMS	33
4.1. STRATEGIES AND POLICY MEASURES	33
4.1.1. <i>The Conservation Strategy of Ethiopia (CSE)</i>	33
4.1.2. <i>The Environmental Policy of Ethiopia</i>	34
4.1.3. <i>The Biodiversity Conservation and Research Policy</i>	35
4.1.4. <i>Ethiopian Biodiversity Strategy and Action Plan (EBSAP)</i>	35
4.2. PROCLAMATIONS AND GUIDELINES.....	36
4.2.1. <i>Environmental Organs Establishment Proclamation</i>	36
4.2.2. <i>Environmental Impact Assessment (EIA) Proclamation</i>	37
4.2.3. <i>EIA Guidelines</i>	37
4.2.4. <i>Pollution Control Proclamation</i>	38
4.2.5. <i>Biosafety Framework</i>	39
4.3. INSTITUTIONAL MEASURES	40
4.3.1. <i>Government Institutions</i>	40
4.3.2. <i>NGOs/CBOs</i>	48
4.3.3. <i>The Industrial Sector</i>	49

5. THE STATUS AND ACHIEVEMENTS OF THE CONVENTIONS	50
5.1. THE STATUS OF THE RIO CONVENTIONS	50
5.1.1. <i>The Convention on Biological Diversity (CBD)</i>	50
5.1.2. <i>United Nations Convention to Combat Desertification</i>	52
5.1.3. <i>Status of the Implementation of the UNFCCC in Ethiopia</i>	54
5.1.4. <i>The Convention on International Trade in Endangered Species in wild fauna and flora (CITES)</i>	55
5.2. STATUS OF CHEMICALS RELATED ENVIRONMENTAL AGREEMENTS	56
5.2.1. <i>The Stockholm Convention</i>	56
5.2.2. <i>The Basel and Bamako Conventions</i>	58
5.2.3. <i>The Rotterdam Convention</i>	60
5.2.4. <i>The Vienna Convention</i>	61
6. CAPACITY GAPS.....	64
6.1. INSTITUTIONAL GAPS	65
6.2. GAPS RELATED TO DEVELOPMENT AND IMPLEMENTATION OF PROACTIVE ENVIRONMENTAL MANAGEMENT TOOLS	65
6.3. POOR ENVIRONMENTAL INFORMATION AND NETWORKING	65
6.4. INADEQUATE LABORATORY INFRASTRUCTURE FOR ENVIRONMENTAL MONITORING	66
6.5. PROMOTION OF ENVIRONMENTAL EDUCATION AND AWARENESS.....	66
6.6. ADOPTION/ADAPTATION OF ENVIRONMENTAL TECHNOLOGIES AND BEST PRACTICES	67
6.7. MOBILIZATION AND CHANNELING OF TECHNICAL AND FINANCIAL RESOURCES	67
6.8. GAPS RELATED COMMUNITY EMPOWERMENT IN ENVIRONMENTAL MANAGEMENT AND SUSTAINABLE LIVELIHOOD.....	67
REFERENCES.....	69

ACRONYMS

ADLI	Agricultural Development Led Industrialization
AEC	Addis Anteneh Consultant/Economist
AIA	Advanced Informed Agreement
ATVET	Agricultural, Technical, Vocational & Educational Training
BSAP	National Biodiversity Strategy and Action Plan
CBD	Convention on Biodiversity
CBOs	Community Based Organization
CITES	Convention on International Trade in Endangered Species
COP	Conference of Parties
CPB	Cartagena Protocol on Biosafety
CSE	Conservation Strategy of Ethiopia
EBSAP	Ethiopian Biodiversity Strategy and Action Plan
ECPC	Ethiopian Cleaner Production Center
EELPA	Ethiopian Electric Power Authority
EELPCo	Ethiopian Electric Power Corporation
EIA	Environmental Impact Assessment
EIC	Environmental Information Center
EIC	Ethiopian Investment Commission
EMS	Environment Management Systems
ENCCD	Ethiopian Coordination Committee for Combating Desertification
ENSAP	Eastern Nile Subsidiary Action Program
EPA	Environmental Protection Authority
EPC	Environmental Protection Council
EPE	Environmental Policy of Ethiopia
ERA	Ethiopian Road Authority
ESID	Ecologically Sustainable Industrial Development Project
EWCO	Ethiopian Wildlife Conservation Organization
FAO	Food and Agricultural Organization
FDRE	Federal Democratic Republic of Ethiopia
FSS	Food Security Strategy
GEF	Global Environmental Facility
GHGs	Green House Gases
GMO	Genetically Modified Organism
HLI	Government Higher Learning Institutions
IBC	Institute of Biodiversity Conservation
IBCR	Institute of Biodiversity Conservation and Research
ICT	Information Communication Technology
IFCS	Intergovernmental Forum on Chemicals Safety
ILO	International Labour Organization
IOMC	Inter Organization Program for the Sound Management of Chemicals
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention and Control
ISO	International Standards Organization
IUCN	International Union for Conservation

LMO	Living Modified Organisms
MEA	
MDG	Millennium Development Goals
MOARD	Ministry of Agriculture and Rural Development
MOID	Ministry of Infrastructure Development
MOTI	Ministry of Trade and Industry
MOWR	Ministry of Water Resources
NAP	National Action Plans
NAP	National Action Program
NBI	Nile Basin Initiative
NCSA	National Capacity Building Needs Self Assessment
NDF	National Desertification Fund
NGO	Non Governmental Organization
NIP	National Implementation Plan
NMSA	National Meteorological Service Agency
OAU	Organization of African Unity
OECD	Organization for Economic Cooperation and Development
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
RAPs	Regional Action Programs
RCSs	Regional Conservation Strategies
SDPRP	Sustainable Development and Poverty Reduction Program
UNCBD	United Nations Convention on Biodiversity
UNCCD	United Nations Convention for Combating Desertification
UNCED	United Nations Conference on Environment and Development
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Program
UNESCO	United Nations Education and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
WMO	World Meteorological Organization
WSDP	Water Sector Development Program

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3. Ministry of Agriculture and Rural Development
4. Ministry of Water Resources
5. Ministry of Trade and Industry
6. Ministry of Infrastructure,
7. Ministry of Capacity Building
8. Forum for Environment

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1. INTRODUCTION AND BACKGROUND

1.1. Introduction

This consultancy service was undertaken on the basis of a contract agreement signed between the Environmental Protection Authority (EPA) and Addis Anteneh Consultant/Economist (AEC) on December 16, 2005¹. The EPA had earlier commissioned AEC (April 2005) to produce a stocktaking report, a capacity needs assessment report, and a capacity building action plan. AEC produced the three generic documents, which were discussed at a workshop organized to review and assess the findings, conclusions and recommendations. The client and all the other stakeholders from both the Federal and Regional institutions attending the workshop accepted the reports.

In addition to the work of the local consulting team, which has produced Stocktaking, Capacity Needs Assessment and Action Plan documents in a generic form, EPA Task Forces and Regional Agencies have been also trying to develop their own region-specific documents. These documents required further review and consolidation as well as integration into the National Capacity Needs Self-Assessment Action Plan.

The assignment is expected to produce three sets of consolidated documents consisting of a stocktaking report, a capacity needs assessment report, and a capacity building action plan. The stocktaking report, which is presented in this document, reviews the existing situation in Ethiopia regarding the nature of the obligations contained in the several international environmental conventions, protocols and other agreements entered into by the country, the status of their implementation, including the existing capacity at national level, as well as the policies and strategies in existence and operation required to meet these undertakings. The second report will present the capacity needs assessments of the various federal level stakeholders (EPA, IBC, NMSA, government sectoral ministries and other public institutions, as well as private sector and non-government organizations) involved in the implementation of the obligations and rights included in the conventions. The capacity building action plan will be presented in the third and final report.

1.2. Background

Ethiopia, because of its geo-physical conditions, (range of altitude, rainfall pattern and soil variability) has an immense ecological diversity and a huge wealth of biological resources. As a result, Ethiopia is known as one of twelve primary centers of origin and diversity in the world. It is a primary gene center and a secondary gene center for several crops. Likewise, Ethiopia is also a region of faunistic diversity.

Ethiopia is experiencing an array of serious environmental challenges and problems. Misuse and abuse of natural resources including unsustainable exploitation and degradation of forests, soils, wildlife, fresh water and other natural resources are threatening the country's economic development prospects.

The country is also facing the problems associated with the atmosphere, *viz.*, climate variability, climate change and pollution of air quality. The country's contribution to the global pool of greenhouse gas emissions is very insignificant. Despite this, Ethiopia is more vulnerable to the impacts of climate change

¹ AEC's team consists of: Dr. Belay Simane, Team Leader and Agronomist and Environment Resource Management Expert, Professor Zerihun Woldu, Ecologist/Environmental Management Expert Dr. Feleke Zewge, Environmental Chemist, and Ato Addis Anteneh, Economist and Advisor to the Team.

because of factors such as widespread poverty, recurrent droughts, and over-dependence on rain-fed agriculture.

Pollution is also a serious environmental problem in Ethiopia. The major pollution problems of the country include improper solid waste disposal and handling, lack of proper sewerage system, lack of proper urban storm water drainage system, pollution of water bodies by solid and liquid wastes from municipal and industrial sources, air pollution from vehicles exhaust, night soil in urban open space and shortage of proper latrines, indoor air pollution from biomass energy use in improperly constructed household kitchens.

Cognizant of the environmental problems it has and the benefits it obtains, Ethiopia is party to many of the international environmental conventions. It has ratified and adopted several conventions and agreements. Each convention has its own obligations that all parties should fulfill in order to achieve sustainable development. The following conventions and agreements are the major ones:

- Convention on Biological Diversity (Ethiopia signed the convention on 10 June 1992 and ratified CBD on 5 April 1994)
- The United Nations Convention to Combat Desertification (UNCCD) in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (Ethiopia signed the UNCCD on Oct 15, 1994 and ratified it on June 27, 1977).
- The United Nations Framework Convention on Climate Change (UNFCCC) (The Vienna Convention and the Montreal Protocol on the Protection of the Ozone Layer (Ethiopia ratified the Vienna Convention and Montreal Protocols October 11, 1994, but has not ratified the London, Copenhagen, Montreal, and Beijing Amendments
- The Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (Basel Convention) and the Bamako Convention on the trans-boundary movement and disposal of hazardous waste in Africa, (Ethiopia ratified both the Geneva agreement on the Amendment to the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal and the Basel Protocol on Liability and Compensation for Damage Resulting from Trans-boundary Movements of Hazardous Wastes and their Disposal on Oct. 8, 2003).
- Convention on Persistent Organic Pollutants (The Stockholm Convention). Ethiopia signed the Stockholm Convention on 17 May 2002 and ratified it on January 9 2003. The Convention came into force on 17 May 2004.)
- Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (The Rotterdam Convention). Ethiopia ratified the Convention on January 9, 2003 which subsequently entered into force on 24 February 2004.).

While EPA is the focal point and coordinator of the international conventions and agreements regarding environment and bio-diversity, the implementing institutions and major stakeholders are different institutions. The country is in the process of implementing the obligations and rights put under the respective conventions since the ratification and adoption of the conventions. The progress made so far includes the establishment and strengthening of relevant institutions, enactment of biological and environmental laws (including the introduction of environmental quality standards), policies, strategies and action plans.

The Constitution, as the supreme law of the country, sets the overall environmental values to be preserved and protected in Ethiopia. Drawing on that, the EPA has set the national vision for an environmentally sustainable development as follows: “To achieve productive environment, self-reliance, improved qualities

of life, equity within and between generations of Ethiopia through environmentally sustainable development and stewardship” (Synopsis for National Capacity Needs Self Assessment, unpublished).

This vision contains the following major elements.

Ecologically, it envisions to

- Achieve the optimal use of non renewable resources;
- Attain productive ecosystems through protecting, restoring and enhancing soil, vegetation, water, wildlife and aquatic resources within their regenerative capacity;
- Ensure that a working and efficient system is laid down so that the source and sink functions of the environment shall not be degraded.

Economically, it will strive to

- Emancipate the generations from a cyclic dependency syndrome for livelihood, by way of transforming locally available environmental resources to tangible societal economic benefits through the wise use of natural resources, indigenous knowledge and local capabilities;
- Achieve fair and equitable access and economic benefits through the realization of community’s rights to economic development and environmentally sustained economic opportunities;
- Attain a diversified economic system to release the pressure on the natural resources through value adding environmentally sound alternative resources or technology at community/local level;
- Transfer the rent component of non-renewable resources to other productive assets.

Socially, it envisages to

- Ensure improved qualities of life for Ethiopians through the provision of environmentally sound social services;
- Realize meaningful community participation and gender equality in environmental management and decision making;
- Foster good environmental governance and stewardship.

In an effort to effectively implement the obligations and rights of the environmental conventions in the country and realizing the environmental vision of Ethiopia, EPA has formulated the following strategic goals.

- Ensure community-led environmental protection for improved livelihood;
- Rehabilitate affected ecosystems;
- Enhanced capacity of ecosystems to deliver goods and services;
- Manage adverse impacts of municipal waste;
- Prevent environmental pollution; and
- Ensure proactively the integration of environmental and ethical concerns in development activities of the country.

It has been realized that the implementation of the above strategic goals requires adequate human, physical and institutional capacity building. Cognizant of this, EPA with the financial assistance of GEF approved a consultancy work to undertake National Capacity Building Needs Self-Assessment (the NCSA project). The specific objectives of the NCSA project include the following:

- Identification and review of the priority issues for action to meet the obligations contained in the conventions, protocols, and their status of implementation;
- Identification and analysis of related capacity needs within and across the conventions and agreements;
- Identification of the nature and extent required in capacity building to meet national environmental management and sustainable development goals to meet the obligations.

The project is expected to produce three sets of documents consisting of a stocktaking report; a capacity needs assessment report, and a capacity building action plan. This stocktaking report, the first NCSA component, presents an overview of the obligations arising from the various conventions the environmental conventions the country is party, describes the relevant policy and legislative measures taken so far, and summarizes the activities being done to meet the respective obligations of the conventions by different stakeholders.

1.3. Objectives of the Stocktaking Report

The main objective of the stocktaking is to make a situation analysis on the obligations of the environmental conventions and assess the measures taken to address environmental problems in the country. The specific objectives include the following:

- Review objectives and obligations of the conventions that the Country is a party to;
- Analyze the measures taken to address environmental problems following the signing and ratification of the conventions;
- Review the policy framework(s) developed by Ethiopia and assess the implications for environmentally sustainable development;

- Assess the gaps in the implementation of the obligations of the conventions and National Action Plans (NAPs).

1.4. Methodology

The consulting team members have made an extensive documentation review of relevant published and unpublished reports and data available in written form. The lists of documents consulted are given in the references.

Discussions were conducted with EPA management staffs and several designated technical and management staffs of stakeholder federal institutions in Addis Ababa.

2. OBJECTIVES AND OBLIGATIONS OF THE CONVENTIONS

2.1 The RIO Conventions

The international community came together in 1992 at the Rio Conference to deal with environment and development problems that humanity has faced in this era. The three Rio Conventions, viz., the United Nations Convention to Combat Desertification (UNCCD), the United Nations Convention on Biodiversity (UNCBD) and the United Nations Framework Convention on Climate Change (UNFCCC) have been the major outcome of this conference.

In recognition of the major environmental problems that are increasingly affecting the country, Ethiopia has joined the international community by signing, adopting and largely ratifying the Rio-Conventions (and the related protocols, agreements, etc formulated on their basis). The country has undertaken a number of measures to pursue their subsequent implementation. While EPA is the focal point and coordinator of the international conventions and agreements regarding environment and bio-diversity, the implementing institutions and major stakeholders are various institutions as described in the following chapters. Regional States have also established and in some instances designated their respective environmental agencies.

The following chapters provide some detail about the background, objectives, basic principles of the RIO conventions, protocols or agreements, as well as the obligations and rights arising from each of these. These rights and obligations concern national governments, international organizations, and individual bilateral and grouped categories (e.g. developed and developing countries).

2.1.1. Convention on Biological Diversity (CBD)

At the 1992 Earth Summit in Rio de Janeiro, world leaders agreed on a comprehensive strategy for "sustainable development": meeting our needs while ensuring that we leave a healthy and viable world for future generations. In ratifying the Convention, the Parties have committed themselves to undertaking national and international measures aimed at its achieving three objectives: the conservation of biological diversity; the sustainable use of its components; and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

Ethiopia has signed the convention on 10 June 1992 and ratified on 5 April 1994 by ratification (Proclamation No. 98/1986). Since the adoption of the Convention, the country has taken steps to translate

the general provisions of the Convention into practical action. This process has initiated the preparation of the national action plans, creation of awareness about biodiversity and led to the adoption of the Cartagena Protocol on Biosafety, a landmark treaty which provides an international regulatory framework for the safe transfer, handling and use of any living modified organisms resulting from modern biotechnology.

Objectives

The objectives of the convention are set out in Article 1. It sets out a balance between conservation, sustainable use and sharing of benefits. The objectives are:

1. the conservation of biological diversity,
2. the sustainable use of its components, and
3. the fair and equitable sharing of the benefits from the use of genetic resources including
 - a. appropriate access to genetic resources, taking into account all rights over those resources;
 - b. transfer of relevant technologies; and
 - c. funding.

Basic Principles and Approaches of CBD

The Convention on Biological Diversity, as an international treaty, identifies a common problem, sets overall goals and policies and general obligations, and organizes technical and financial cooperation. However, the responsibility for achieving its goals rests largely with the countries themselves.

Governments need to provide the critical role of leadership, particularly by setting rules that guide the use of natural resources, and by protecting biodiversity where they have direct control over the land and water. Under the Convention, governments should undertake conservation and utilization of biodiversity in a sustainable way. They are required to develop national biodiversity strategies and action plans, and to integrate these into broader national plans for environment and development. This is particularly important for such sectors as forestry, agriculture, fisheries, energy, transportation and urban planning.

One of the first steps towards a successful national biodiversity strategy is to conduct surveys to find out what biodiversity exists, its value and importance, and what is endangered. On the basis of these survey results, governments can set measurable targets for conservation and sustainable use. National strategies and programs need to be developed or adapted to meet these targets.

The conservation of each country's biological diversity can be achieved in various ways. "*In-situ*" conservation - the primary means of conservation - focuses on conserving genes, species, and ecosystems in their natural surroundings, for example by establishing protected areas, rehabilitating degraded ecosystems, and adopting legislation to protect threatened species. "*Ex-situ*" conservation uses zoos, botanical gardens and gene banks to conserve species.

Promoting the sustainable use of biodiversity will be of growing importance for maintaining biodiversity in the years and decades to come. Under the Convention, the "ecosystem approach to the conservation and sustainable use of biodiversity" is being used as a framework for action, in which all the goods and services provided by the biodiversity in ecosystems are considered. The Convention is promoting activities to ensure that everyone benefits from such goods and services in an equitable way.

The most relevant issues that all the parties of CBD should understand and reach a common ground are the following complex and interrelated topics:

- Access to genetic resources;
- Benefit sharing associated both with access to the resources and with their ultimate use;
- Intellectual property rights;
- Farmers' rights; and
- Conservation and use of genetic resources.

National Obligations and Rights

CBD makes commitments to integrate the sustainable use and conservation of biodiversity into national and international decision-making, including:

- Scientific and technical cooperation: including access to and transfer of biotechnology.
- Regulatory measures: On access to genetic resources. Control of risks derived from organisms modified through biotechnology.
- Natural resource management: Establishment of protected areas and rehabilitation. Restoration of degraded ecosystems and threatened species. Prevention/control and eradication of alien species, which threaten biodiversity.
- Shared benefits from genetic resources: recognising national sovereignty and ensuring access to biological resources is based on “mutually agreed terms” subject to “prior informed consent”.
- Traditional knowledge: recognition of the role of indigenous and local communities, ensuring that such groups receive a share in the benefits obtained from their use and conservation, further to “respect, preserve and maintain” their knowledge and practices.
- Provision of financial resources: targeted to CDB related activities.

2.1.2. Cartagena Protocol on Biosafety (CPB)

The Convention on Biological Diversity recognizes that biotechnology can make a contribution towards achieving the objectives of the Convention, if developed and used with adequate safety measures for the environment and human health. It also recognizes the need for and modalities of a protocol, which will set out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any Genetically Modified Organism (GMOs).

The Cartagena Protocol on Biosafety was adopted by the Conference of the Parties to the Convention on Biological Diversity as a supplementary agreement to the Convention on 29 January 2000 (Secretariat of the Convention on Biodiversity, 2000). Ethiopia became a signatory of this Protocol and finally ratified it on September 22, 2003.

The Protocol seeks to protect biological diversity from the potential risks posed by GMOs resulting from modern biotechnology, and establishes an advanced informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms into their territory.

The coming into force of the Biosafety Protocol requires that parties establish a National Biosafety Framework, which includes a policy, a regulatory regime, a system to handle notifications, systems for monitoring and inspection and a system for public information and participation.

Liability and redress being one of the most crucial issues regarding Biosafety, nevertheless it is not addressed under the Protocol. Under Article 27, it was decided that the Conference of Parties (COP) to the Protocol, would adopt a process with respect to the appropriate elaboration of international rules and procedures in this area within four years. This issue was a major point of deliberation during the negotiation of the Protocol.

Objectives

The objective of the Protocol is to contribute to the safe transfer, handling and use of LMOs that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.

National Obligations and Rights

Biosafety Protocol commitments include:

- Designate one national focal point to be responsible for liaison with the Secretariat. In addition each party is required to designate competent national authorities, which will be responsible to perform the administrative functions required by the Protocol on its behalf.
- Control on trans-boundary movement of GMOs: Article 27 establishes a process to development international rules and procedures for liability and redress the negative impacts from trans-boundary movements of GMOs. This is based on the concept of the Precautionary Principle.
- GMO standards: Sets requirements for Labelling of LMO imports. Imposes “Advanced Informed Agreement” procedures on the import of seeds, live fish and other GMOs, which are to be intentionally introduced into the environment.

2.1.3. United Nations Convention for Combating Desertification (UNCCD)

Recognizing the need to combat desertification to ensure the long-term productivity of inhabited dry lands, the United Nations Convention for Combating Desertification (UNCCD) was adopted at the United Nations Headquarters, New York on the 9 May 1992; it was open for signature at the Rio de Janeiro from 4 to 14 June 1992, and thereafter at the United Nations Headquarters, New York, from 20 June 1992 to 19 June 1993. The Convention entered into force on 21 March 1994 (www.unccd.entico.com/english/test.htm, United Nations General Assembly, 1994).

Objectives

The objective of this Convention is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported by international cooperation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in affected areas.

Fundamental Principles

In order to achieve the objective of this Convention and to implement its provisions, the Parties shall be guided, *inter alia*, by the following principles:

- the Parties should ensure that decisions on the design and implementation of programs to combat desertification and/or mitigate the effects of drought are taken with the participation of populations and local communities and that an enabling environment is created at higher levels to facilitate action at national and local levels;
- the Parties should, in a spirit of international solidarity and partnership, improve cooperation and coordination at sub-regional, regional and international levels, and better focus financial, human, organizational and technical resources where they are needed;
- the Parties should develop, in a spirit of partnership, cooperation among all levels of government, communities, non-governmental organizations and landholders to establish a better understanding of the nature and value of land and scarce water resources in affected areas and to work towards their sustainable use; and
- the Parties should take into full consideration the special needs and circumstances of affected developing country Parties, particularly the least developed among them.

Obligations and Rights

The obligations are categorized into general and those specific to developed countries and those specific to countries affected by desertification.

General Obligation of the Parties to the Convention

The Parties shall implement their obligations under this Convention, individually or jointly, either through existing or prospective bilateral and multilateral arrangements or a combination thereof, as appropriate, emphasizing the need to coordinate efforts and develop a coherent long-term strategy at all levels.

In pursuing the objective of this Convention, the Parties shall engage in eight distinct but interrelated activities. These are:

- adopt an integrated approach addressing the physical, biological and socio-economic aspects of the processes of desertification and drought;
- give due attention, within the relevant international and regional bodies, to the situation of affected developing country Parties with regard to international trade, marketing arrangements and debt with a view to establishing an enabling international economic environment conducive to the promotion of sustainable development;
- integrate strategies for poverty eradication into efforts to combat desertification and mitigate the effects of drought;
- promote cooperation among affected country Parties in the fields of environmental protection and the conservation of land and water resources, as they relate to desertification and drought;
- strengthen sub regional, regional and international cooperation;
- cooperate within relevant intergovernmental organizations;
- determine institutional mechanisms, if appropriate, keeping in mind the need to avoid duplication; and
- promote the use of existing bilateral and multilateral financial mechanisms and arrangements that mobilize and channel substantial financial resources to affected developing country Parties in combating desertification and mitigating the effects of drought.

Obligations of Developed Country Parties

In addition to general obligations, developed country Parties undertake to:

- actively support, as agreed, individually or jointly, the efforts of affected developing country Parties, particularly those in Africa, and the least developed countries, to combat desertification and mitigate the effects of drought;
- provide substantial financial resources and other forms of support to assist affected developing country Parties, particularly those in Africa, effectively to develop and implement their own long-term plans and strategies to combat desertification and mitigate the effects of drought;
- promote the mobilization of new and additional funding;
- encourage the mobilization of funding from the private sector and other non-governmental sources; and
- promote and facilitate access by affected country Parties, particularly affected developing country Parties, to appropriate technology, knowledge and know-how.

Obligations of Affected Country Parties

In addition to the general obligations, affected country Parties undertake to:

- give due priority to combating desertification and mitigating the effects of drought, and allocate adequate resources in accordance with their circumstances and capabilities;
- establish strategies and priorities, within the framework of sustainable development plans and/or policies, to combat desertification and mitigate the effects of drought;
- address the underlying causes of desertification and pay special attention to the socio-economic factors contributing to desertification processes;
- promote awareness and facilitate the participation of local populations, particularly women and youth, with the support of non-governmental organizations, in efforts to combat desertification and mitigate the effects of drought; and
- provide an enabling environment by strengthening, as appropriate, relevant existing legislation and, where they do not exist, enacting new laws and establishing long-term policies and action programs.

2.1.4. The United Nations Framework Convention on Climate Change (UNFCCC)

In 1988, the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) created an Intergovernmental Panel on Climate Change (IPCC) to give an independent report on climate change. The report stated that global warming was real and urged that something be done about it.

The report spurred governments to create the United Nations Framework Convention on Climate Change (UNFCCC). By standards for international agreements, negotiation of the Convention was rapid. It was ready for signature at the 1992 United Nations Conference on Environment and Development (UNCED) more popularly known as the "Earth Summit" in Rio de Janeiro, Brazil, on 4 June 1992, and came into force on 21 March 1994. Today, 186 governments and the European Community are Parties to the Convention.

Ethiopia became a signatory to the convention on June 10, 1994 and ratified on April 5, 1994 and entered into force on July 4, 1994.

Objectives

The objectives of the Convention are:

- stabilise the concentrations of Green House Gases (GHGs, e.g. carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) in the atmosphere that are related to human induced interference with the climate system
- achieve the stabilization within a time-frame sufficient to allow ecosystems to adapt naturally to climate change
- ensure that food production is not threatened and
- enable economic development to proceed in a sustainable manner.

Guiding Principles

The Guiding Principles of the Parties to the Convention in their actions to achieve the objective of the Convention and to implement its provisions are:

- The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects.
- The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.
- The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.
- The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programs, taking into account that economic development is essential for adopting measures to address climate change.
- The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

Obligations of the Parties

The Convention divides countries into two groups: those listed in its Annex I (known as "Annex I Parties") and those that are not so listed (so-called "non-Annex I Parties").

The Annex I Parties are the industrialized countries who have historically contributed the most to climate change. They include both the relatively wealthy countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992, and countries with "economies in transition" (known as EITs), that is, the Russian Federation and several other Central and Eastern European countries. The per capita emissions of Annex I Parties are higher than those of most developing countries and they have greater financial and institutional capacity to address climate change.

Obligations of the Annex I Parties

- Presentation to the COP of a national inventory of emissions
- Formulate national and regional programmes with measures to mitigate climate change. The principles of equity and "common but differentiated responsibilities" enshrined in the Convention require Annex I Parties to take the lead in modifying longer-term trends in emissions. To this end, Annex I Parties are committed to adopting national policies and measures with the non-legally binding aim of returning their greenhouse gas emissions to 1990 levels by the year 2000.
- Cooperation: A joined-up approach is vital to reduce GHG emissions, including action relating to transport, energy, industry, agriculture, forestry and waste management.
- Industrial responsibility: the Convention recognizes industrial countries bear the greatest responsibility to carry out the agreement as the principal GHG emitters, including technology transfer and financial commitment. Financial assistance and technology transfer are critical to enabling non-Annex I Parties to address climate change and adapt to its effects. Financial assistance is therefore provided by Annex I Parties and mostly channeled through the Convention's financial mechanism. Greater emphasis is now being placed on supporting capacity-building initiatives in both non-Annex I Parties.

Obligation of the Non-Annex I Parties

The developing countries make up the group of non-Annex I Parties. These countries must

- present to the COP a national inventory of emissions
- formulate national and regional programmes with measures to mitigate climate change, incorporating principles of "common but differentiated responsibilities"
- cooperate with Annex I parties on joined-up approach to receive funding from the Convention's financial mechanism, operated by the Global Environment Facility (GEF).

In general the enabling environments component of the framework focuses on government actions, such as fair trade policies, removal of technical, legal and administrative barriers to technology transfer, sound economic policy, regulatory frameworks and transparency, all of which create an environment conducive to private and public sector technology transfer.

The Intergovernmental Panel on Climate Change (established 1988) reports, monitors and reviews progress on GHG stabilization at a global level. The GEF operates the financial mechanism for FCCC on an on-going basis, with four yearly reviews of its role and responsibilities.

The Kyoto Protocol

The Kyoto Protocol was created to augment the convention with agreement of stricter demands for reducing the greenhouse-gas emissions. It marks the first step towards an international determination to limit emissions of greenhouse gases. It can be an important mechanism towards correcting the climate policy failure and a major push towards the internalization of the climate change externality. The text of the Kyoto Protocol was adopted unanimously in 1997. The Kyoto Protocol includes six greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). The Kyoto Protocol shall enter into force on the ninetieth day after the date when not less than 55 Parties to the Convention, incorporating Annex I Parties which accounted in total for at least 55 % of the total carbon dioxide emissions for 1990 from that group, have deposited their instruments of ratification, acceptance, approval or accession. Twelve out of the 37 Annex I countries have yet to ratify the Protocol.

Commitments of the Kyoto Protocol

The Protocol's major feature is that it has mandatory targets on greenhouse-gas emissions for the world's leading economies, which have accepted it. These targets range from - 8 per cent to +10 per cent of the countries' individual 1990 emissions levels "with a view to reducing their overall emissions of such gases by at least 5 per cent below existing 1990 levels in the commitment period 2008 to 2012."

To compensate for the sting of "binding targets," as they are called, the agreement offers flexibility in how countries may meet their targets. For example, they may partially compensate for their emissions by increasing "sinks", forests, which remove carbon dioxide from the atmosphere which may be accomplished either on their own territories or in other countries or they may pay for foreign projects that result in greenhouse-gas cuts. Three mechanisms have been set up for this purpose. These are

- Joint Implementation (JI) This provides for Annex I Parties to implement projects that reduce emissions, or remove carbon from the atmosphere, in other Annex I Parties, in return for emission reduction.
- The Clean Development Mechanism (CDM). This provides for Annex I Parties to implement projects that reduce emissions in non-Annex I Parties, or absorb carbon through afforestation or reforestation activities, in return for certified emission reductions and assist the host Parties in achieving sustainable development and contributing to the ultimate objective of the Convention.
- Emission trading. This provides for Annex I Parties to acquire units from other Annex I Parties and use them towards meeting their emissions targets under the Kyoto Protocol. This enables Parties to make use of lower cost opportunities to reduce emissions, irrespective of the Party in which those opportunities exist.

2.1.5. The Convention on International Trade in Endangered Species (CITES)

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between Governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation. CITES was conceived

in the spirit of such cooperation. Today, it accords varying degrees of protection to more than 30,000 species of animals and plants, whether they are traded as live specimens, fur coats or dried herbs.

CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union). The text of the Convention was finally agreed at a meeting of representatives of 80 countries in Washington DC., United States of America, on 3 March 1973, and on 1 July 1975 CITES entered in force. (www.cites.org/eng/disc/text.shtml#texttop). Ethiopia has signed the convention on 05/04/1989 and ratified on 04/07/1989.

CITES is an international agreement to which States (countries) adhere voluntarily. States that have agreed to be bound by the Convention ('joined' CITES) are known as Parties. Although CITES is legally binding on the Parties – in other words they have to implement the Convention – it does not take the place of national laws. Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.

For many years CITES has been among the conservation agreements with the largest membership, with now 169 Parties

UNEP-WCMC (United Nations Environmental Program –World Conservation Monitoring Centre) manages, analyses and delivers information on animal and plant species in support of their conservation and sustainable use, and provides support to others in information management.

Roughly 5,000 species of animals and 28,000 species of plants are protected by CITES against over-exploitation through international trade. They are listed in the three CITES Appendices. The species are grouped in the Appendices according to how threatened they are by international trade. This database was created and is maintained by UNEP-WCMC with financial support from the European Commission and the Joint Nature Conservation Committee of the United Kingdom. This information resource is a result of long-term collaboration between countless individual scientists worldwide and many organizations whose contribution is gratefully acknowledged.

The number and status of Cites Appendices in Ethiopia is given in the Table below

CITES - Listed Animal Species of Ethiopia	
Appendix I	13
Appendix II	152
Appendix I/II	2
Deleted	8
Reservations and Withdrawals of Animal species	
Appendix I/r	23
Appendix II/r	15
Appendix III/r	100
Appendix I/w	16
Appendix II/w	11
Appendix III/w	96
CITES - Listed Plant Species of Ethiopia	
Appendix II	126
Deleted	17
Reservations and Withdrawals of Plant Species	
Appendix II/r	23

The List of species in each Appendix are given in the Annex document.

Reservations made by Parties are listed by adding 'r' to the Appendix number, to signify the entry into force, and 'w' to signify the withdrawal of the reservation.

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Objectives

Trade in specimens of endangered species must be subject to strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances. Species not necessarily threatened with extinction at present may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival.

The overriding goal of the Convention is therefore to ensure that international trade in specimens of wild fauna and flora does not threaten the survival of the species traded. CITES is conceptually limited to prevent the overexploitation of international traded wildlife.

Mechanisms for implementation

Each Party designates one or more Management Authorities to be responsible for administering the Convention and one or more Scientific Authorities to advise them on technical issues. Parties must also adopt domestic legislation, which prohibits international trade in specimens in violation of the Convention, penalizes such trade, and allows for confiscation of specimens illegally traded or possessed. The Convention classifies species in three categories:

Appendix I	Species threatened with extinction that are or could be affected by trade
Appendix II	Species not necessarily in danger of extinction but which could become so if trade in them were not strictly regulated, as well as those for which trade must be strictly regulated in order to render effective the measures taken on behalf of the former
Appendix III	Species that are protected by the States that list them and for which those States seek co-operation of the other Parties that control trade.

CITES is a taxon-based Convention, meaning that all wild species can be considered for inclusion in its appendices. If the criteria for inclusion in the appendices are met, and the proposal is accepted by two-thirds of voting Parties, the species shall be listed.

Obligations

- The Parties shall take appropriate measures to enforce the provisions of the present Convention and to prohibit trade in specimens in violation thereof. These shall include measures:
 - to penalize trade in, or possession of, such specimens, or both; and
 - to provide for the confiscation or return to the State of export of such specimens.
- A Party may, when it deems it necessary, provide for any method of internal reimbursement for expenses incurred as a result of the confiscation of a specimen traded in violation of the measures taken in the application of the provisions of the present Convention.
- As far as possible, the Parties shall ensure that specimens shall pass through any formalities required for trade with a minimum of delay. To facilitate such passage, a Party may designate ports of exit and ports of entry at which specimens must be presented for clearance. The Parties shall ensure further that all living specimens, during any period of transit, holding or shipment, are properly cared for so as to minimize the risk of injury, damage to health or cruel treatment.
- Where a living specimen is confiscated
 - the specimen shall be entrusted to a Management Authority of the State of confiscation;
 - the Management Authority shall, after consultation with the State of export, return the specimen to that State at the expense of that State, or to a rescue centre or such other place as the Management Authority deems appropriate and consistent with the purposes of the present Convention; and
 - the Management Authority may obtain the advice of a Scientific Authority, or may, whenever it considers it desirable, consult the Secretariat in order to facilitate the return the specimen to that State at the expense of that State including the choice of a rescue center or other place.
- Each Party shall maintain records of trade in specimens of species included in Appendices I, II and III which shall cover:
 - the names and addresses of exporters and importers; and
 - the number and type of permits and certificates granted; the States with which such trade occurred; the numbers or quantities and types of specimens, names of species as included in Appendices I, II and III and, where applicable, the size and sex of the specimens in question.
- Each Party shall prepare periodic reports on its implementation of the present Convention and shall transmit to the Secretariat:
 - an annual report containing a summary of the information specified in sub-paragraph (b) of paragraph 6 of this Article; and
 - a biennial report on legislative, regulatory and administrative measures taken to enforce the provisions of the present Convention.
- The periodic Reports shall be available to the public where this is not inconsistent with the law of the Party concerned.

2.1.6 The Synergy of the Rio Conventions

Key outcomes of the 1992 Earth Summit in Rio were several international environmental agreements. The agreements support specific environmental aspects for the implementation of Agenda 21 and the Rio Principles. The key environmental agreements, in addition to the scientific approach, contain many similar requirements for action, research, reporting and other necessary activities agreed by their signatories.

- Approaches to goals – The instruments adopt similar approaches to achieve their goals. They recognize needs for national action guided by international experiences. All of them recognize the need for capacity building, awareness rising as a precondition to their successes. All of them also identify need for cooperation.
- Approaches to activities: All of these instruments promote activities of research, assessments, information exchange, training, development of strategies and action plans and inventories. However, the decisions of design and detail are left open for interpretation by individual governments.
- Subsidiary Bodies for Scientific and Technological Advice All the Conventions require creation of an international body of scientific and technical expertise. CBD works through SBSTTA, UNFCCC through SBSTA and CCD through Committee on Science and Technology. However, the linkages between these bodies are weak and wanting.
- Information, Monitoring and Reporting Biodiversity, Climate Change and Desertification Convention have independent methods and ways of addressing information needs and information generation. They have independent monitoring and reporting requirements. They all fail both individually and collectively to underline the principles of monitoring as a common denominator in addition to failing to facilitate common reporting from national governments.

Even though EPA the national focal point for all environment-related conventions and agreements, implementation of these Conventions is under different institutions, often with a high degree of disconnect. Such disconnects lead to ineffective implementation, though not individually at Convention level, but collectively to achieve sustainable development.

The barriers to achieve synergies in the Ethiopian context are technical (lack of understanding of cross-sectoral issues, information, impact assessments etc.), political (inter-departmental conflicts, issues of 'territoriality', lack of guiding principles and understanding at policy making level) and cultural (thoughts of not overstepping boundaries and lack of insight to working at local or ground levels). In the face of these challenges there is a need to develop and enhance synergies between the instruments in terms of their implementation at local, national and regional levels. In some instances synergies and integrated approaches exist and can be built upon and in some cases efforts are needed to stimulate collaboration, cooperation and harmonization.

2.2. Chemicals Related Conventions

In 1992, the United Nations Conference on Environment and Development ("Rio Conference") marked an important event that led towards the goal of achieving sustainable economic development, which meets the needs of the present without compromising the needs of future generations. Heads of States or Governments from more than 150 member countries of the United Nations adopted "Agenda 21", a comprehensive document outlining responsibilities of States towards the achievement of sustainable development (Agenda 21, 1992). Accordingly, all countries present at the Rio Conference agreed on the goal of achieving the sound management of chemicals by the year 2000 on the basis of Chapter 19 of "Agenda 21" which is entitled "Environmentally Sound Management of Toxic Chemicals, including Prevention of Illegal International Traffic in Toxic and Dangerous Products".

In 1994, the International Conference on Chemical Safety (Stockholm, Sweden) brought together high-level representatives from more than 100 countries to identify priorities to implement Chapter 19 and to establish mechanisms for the implementation of its recommendations. The Stockholm Conference established the Inter-governmental Forum on Chemicals Safety (IFCS), through which countries now regularly discuss their activities and priorities for the sound management of chemicals. The Stockholm Conference, also marking the first meeting of the IFCS, adopted a "Priorities for Action" plan to implement the recommendations of Chapter 19 of Agenda 21.

At the level of international organizations, FAO, OECD, ILO, UNIDO, UNEP and WHO established in 1995 the Inter-Organization Program for the Sound Management of Chemicals (IOMC), a co-operative agreement to co-ordinate activities in the area of chemicals management. Based on the guidance provided through the IFCS, international organizations will increasingly co-operate towards linking and integrating their respective programs in the area of chemical management and safety.

Since the late 1980's several international policy instruments have been adopted which address specific aspects of chemicals management. These instruments include, for example:

- UNEP London Guidelines for the Exchange of Information on Chemicals in
- International Trade (as amended in 1989);
- FAO International Code of Conduct for the Distribution and Use of Pesticides (as amended in 1989);
- ILO 1990 Convention on the Safety of Chemicals at the Workplace (No. 170);
- *Part A: International and National Policy Frameworks Guidance Document for Preparing a National Profile Page 88; and*
- ILO 1993 Convention Concerning the Prevention of Major Industrial Accidents (No. 174)

Furthermore, the General Assembly of the United Nations, as well as regional bodies, adopted resolutions and conventions which address the management of chemicals, for example, Resolution 44/226 of the General Assembly on "Traffic in and Disposal, Control and Trans-boundary Movement of Toxic and Dangerous Products and Wastes", or the various conventions adopted under the auspices of the United Nations Economic Commission for Europe.

In addition, a number of guidance documents have been or are being prepared by international organizations (both inter-governmental and non-governmental) to assist countries in establishing and implementing chemicals management schemes.

All these efforts are further related to the four major Chemical Conventions and the Montreal Protocol:

- The Basel Convention on the Control of Trans-boundary Movements of Hazardous Waste and their Disposal (1989)
- The Bamako Convention on the Ban of Import into Africa and the Control of Transboundary Movement and Management of Hazardous wastes within Africa (January 1991)
- The Stockholm Convention on Persistent Organic Pollutants (2001)
- The Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)
- The Montreal Protocol on Substances that Deplete the Ozone Layer

All these multilateral environmental agreements (MEAs) are legally binding documents with one common goal: to facilitate the establishment/strengthening of national programs for the sound management of chemicals in all countries. Chapter 19 of Agenda 21 points out that basic elements of such programs should include, for example: adequate legislation; information gathering and dissemination; capacity for risk assessment and interpretation; establishment of risk management policy; capacity for implementation and enforcement; capacity for rehabilitation of contaminated sites and poisoned persons; effective education programs; and capacity to respond to emergencies. According to Chapter 19, national programs for the sound management of chemicals should be in place in all countries by the year 2000 (Agenda 21, 1992). Accordingly parties are required to develop strategic approach to national chemical management system, which will contribute to the Global Environmental management.

2.2.1. The Vienna Convention and the Montreal Protocol

The Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer came into force consistent with the provisions of the Declaration of the United Nations Conference on the Human Environment, and in particular principle 21, which provides that “States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”. 28 countries initially adopted the text of the Vienna Convention for the Protection of the Ozone Layer on 22 March 1985 at the Conference of Plenipotentiaries on the Protection of the Ozone Layer and as deposited with the Secretary-General of the United Nations. It emphasizes on the work and studies proceeding within both international and national organizations (in particular, of the World Plan of Action on the Ozone Layer of the United Nations Environment Program) and on the need for further research and systematic observations to further develop scientific knowledge of the ozone layer and possible adverse effects resulting from its modification. The measures to protect the ozone layer from modifications due to human activities therefore require international co-operation and action.

As of November 2001, 184 Parties have ratified the Vienna Convention. The Parties to this Convention also established the Montreal Protocol on Substances that Deplete the Ozone Layer. A State or a regional economic integration organization may not become party to a protocol (with or without the amendments) unless it is, or becomes at the same time, a Party to the Convention. The Montreal Protocol on Substances that Deplete the Ozone Layer was open for signature by States and by regional economic integration organizations in Montreal on 16 September 1987. It was either adjusted and/or amended in London (1990), Copenhagen (1992), Vienna (1995), Montreal (1997) and Beijing (1999). Ethiopia ratified the Vienna Convention and Montreal Protocols on October 11, 1994, but did not ratify the London, Copenhagen, Montreal, and Beijing Amendments.

The Ozone Secretariat is the Secretariat for the Vienna Convention for the Protection of the Ozone Layer and for the Montreal Protocol on Substances that Deplete the Ozone Layer, housed at the offices of the United Nations Environment Program (UNEP) in Nairobi, Kenya.

Objectives of the Vienna Convention and the Montreal Protocol

The Vienna Convention aims at protecting the ozone layer from modifications, due to human activities, require international co-operation and action, and are based on relevant scientific and technical considerations.

The Montreal Protocol was developed to minimize world-wide emissions of certain substances (controlled substances listed under Annexes A, B, C and E of the Protocol) that can significantly deplete and otherwise modify the ozone layer in a manner that is likely to result in adverse effects on human health and the environment. On the basis of this protocol, protection of the ozone layer involves actions of precautionary measures to control global emissions of substances that deplete it, with the ultimate objective of their elimination on the basis of scientific research and findings.

Both the Convention and Protocol encourage the promotion of international co-operation in the research, development and transfer of alternative technologies relating to the control and reduction of emissions of substances that deplete the ozone layer. The implementation of the Convention and the Protocol also take into account the circumstances and particular requirements of developing countries (Article 4 paragraph 2 of the Convention and Article 5 of the Protocol).

General Obligations of the Vienna Convention

Article 2 of the Convention for Protection of the Ozone Layer lays down the following obligations:

- The Parties shall take appropriate measures in accordance with the provisions of this Convention and of those protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities, which modify or are likely to modify the ozone layer.
- To this end the Parties shall, in accordance with the means at their disposal and their capabilities:
 - a) Co-operate by means of systematic observations, research and information exchange in order to better understand and assess the effects of human activities on the ozone layer and the effects on human health and the environment from modification of the ozone layer;
 - b) Adopt appropriate legislative or administrative measures and co-operate in harmonizing appropriate policies to control, limit, reduce or prevent human activities under their jurisdiction or control should it be found that these activities have or are likely to have adverse effects resulting from modification or likely modification of the ozone layer;
 - c) Co-operate in the formulation of agreed measures, procedures and standards for the implementation of this Convention, with a view to the adoption of protocols and annexes;
 - d) Co-operate with competent international bodies to implement effectively this Convention and protocols to which they are party.

Obligations under the Montreal Protocol

The obligations under this Protocol are very detailed and require pertinent follow-up of the country, which is Party to the Protocol. This include Articles 2, 2A-I (control measures) Article 3 (calculation of control levels), Article 4 (control of trade with non-parties, control of trade with parties), Article 4B (licensing), Article 5 (special situation of developing countries), Article 6 (assessment and review of control measures), Article 7 (reporting of data) Article 9 (research, development, public awareness and exchange of information) as well as Article 10A (transfer of technology). Summary of the obligations under the Vienna Convention and the Montreal Protocol as well the required actions to be implemented nationally are given in the Annex part.

Rights under the Vienna Convention and the Montreal Protocol

In accordance with Article 4 Paragraph 2 of the Vienna Convention, the Parties shall co-operate, consistent with their national laws, regulations and practices and taking into account in particular the needs of the developing countries, in promoting, directly or through competent international bodies, the development and transfer of technology and knowledge. Such co-operation shall be carried out particularly through:

- Facilitation of the acquisition of alternative technologies by other Parties
- Provision of information on alternative technologies and equipment, and supply of special manuals or guides to them
- Supply of necessary equipment and facilities for research and systematic observations
- Appropriate training of scientific and technical personnel.

The Montreal Protocol also considers a special provision required to meet the needs of developing countries for additional financial resources and access to relevant technologies - including funds that can be expected to make a substantial difference in the world's ability to address the scientifically established problem of ozone depletion and its harmful effects (Preamble and Article 10 -Financial mechanism). The multilateral fund under Article 10 of the Protocol establishes finance clearing-house functions under the financial mechanism, also considering the special needs of developing countries: (a) distributing information and relevant materials, and hold workshops, training sessions, and other related activities and (b) facilitating and monitoring other multilateral, regional and bilateral co-operation to Parties that are developing countries.

The other provisions for Parties to the Protocol are the functions of financial clearing-house to: (i) assist Parties operating under paragraph 1 of Article 5, through country specific studies and other technical co-operation, to identify their needs for co-operation; and (ii) facilitate technical co-operation to meet these identified needs.

2.2.2. The Basel Convention

This Convention is a Global Environmental Treaty aimed at regulating and controlling the transboundary movements of hazardous wastes and their disposal at international and national levels. It was adopted on 22 March 1989 by 116 states in Basel, Switzerland and came into force on 5 May 1992. The pillars of the Basel Convention are regulation of all transboundary movements of hazardous wastes and environmentally sound management of hazardous wastes and other Wastes and of their disposal (Basel Convention, 1989).

The Basel Convention covers hazardous wastes that are explosive, flammable, poisonous, infectious, corrosive, toxic, or eco-toxic. The categories of wastes and the hazardous characteristics are set out in Annexes I to III of the Convention. The Convention defines 47 categories of wastes in its Annexes I and II. The Convention lists 13 classes of hazardous characteristics which waste could exhibit (Annex III). Lists of specific wastes characterized as hazardous or non-hazardous are in Annexes VIII and IX. Wastes that are covered by the Convention are Hazardous wastes that belong to any category contained in Annex I of the Convention (Y1 – 18 or Y19-45), unless they do not possess any of the characteristics contained in Annex III of the Convention; Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs). Any congener of polychlorinated dibenzo-furan and any congener of polychlorinated dibenzo-p-dioxin are also subject to control (<http://www.basel.int/>)

The principles that are agreed upon in the development of waste and hazardous waste management strategies include (SPREP Hand Book):

- The Source Reduction Principle
- The Integrated Life-cycle Principle
- The Precautionary Principle
- The Integrated Pollution Control Principle
- The Standardization Principle
- The Self-sufficiency Principle
- The Proximity Principle
- The Least Transboundary Movement Principle
- The Polluter Pays Principle
- The Principle of Sovereignty
- The Principle of Public Participation

Objectives

A central goal of the Basel Convention is “environmentally sound management” (ESM), the aim of which is to protect human health and the environment by minimizing hazardous waste production whenever possible. The key objectives of Basel Convention are to:

- Reduce trans-boundary movements of hazardous wastes to a minimum consistent with their environmentally sound management;
- To treat and dispose of hazardous wastes as close as possible to their source of generation;
- Minimize generation of hazardous wastes in terms of quantity and hazardousness;
- To ensure strict control over the movement of hazardous wastes across borders as well as prevention of illegal traffic;
- To prohibit shipments of hazardous wastes to countries lacking legal, administrative and technical capacity to manage and dispose of them in an environmentally sound manner;
- To assist developing countries in the environmentally sound management of hazardous and other wastes they generate.

Obligations of the Parties of the Basel Convention

Countries have obligations to avoid or minimize waste generation and to ensure the availability of adequate facilities for their waste, so as to protect human health and the environment (Basel Convention, 1989).

The main provisions of the convention focus on the 5 major areas:

- Taking steps to identify and quantify the types of waste being produced nationally;
- Use of best practice to avoid or minimize the generation of hazardous waste, such as the use of clean methods;
- Provision of sites or facilities authorized as environmentally sound to manage wastes, in particular hazardous wastes.

- Strict control over the movement of hazardous wastes across borders as well as prevention of illegal traffic;
- Reduction of trans-boundary movements of hazardous wastes to a minimum consistent with their environmentally sound management.

The Basel Convention contains specific provisions for the monitoring of implementation and compliance. A number of articles in the Convention oblige Parties (national governments which have acceded to the Convention) to take appropriate measures to implement and enforce its provisions, including measures to prevent and punish conduct in contravention of the Convention. Summary of the obligations of the Basel Conventions are shown in Annex.

2.2.3. The Bamako Convention

The Bamako Convention on the ban of the Import into Africa and the Control of Transboundary Movement of Hazardous Wastes within Africa was adopted in Bamako, Mali, on 30 January 1991. The Convention obligates Parties to take appropriate legal, administrative and other measures within the area under their jurisdiction to prohibit the import of all hazardous wastes, for any reason, into Africa from non-contracting Parties. Such import shall be deemed illegal and criminal act. The Bamako Convention stipulates that Parties shall promote clean production methods applicable to entire product lifecycles including, *inter alia*, reintroduction of the product into industrial systems or nature when it no longer services a useful function. The Bamako Convention provides detailed procedures for the control of transboundary movement between Parties and transboundary movement from a Party through States, which are not Parties respectively.

The categories of wastes listed in Annex I to the Bamako Convention, a waste possessing any of the characteristics listed in Annex II to the Bamako Convention, as well as any waste considered to be hazardous by the domestic laws of either the state of import, export, or transit are considered hazardous wastes for the purposes of the Bamako Convention (Bamako Convention, 1991).

Objectives

The objectives of the Bamako Convention are to protect human health and the environment from dangers posed by hazardous wastes by reducing their generation to a minimum in terms of quantity and/or hazard potential.

General Obligations

- Obligation to prohibit the import of all hazardous wastes, for any reason, into Africa from non-Contracting Parties.
- The Prohibition of dumping of hazardous wastes, including their incineration at sea and their disposal in the seabed and the sub-seabed; any dumping of hazardous wastes at sea, including incineration at sea as well as seabed and sub-seabed disposal
- Control of Hazardous Waste Generation in Africa

Summary of the obligations under the Bamako Convention and the required actions to be implemented nationally are given in the Annex part.

2.2.4. The Stockholm Convention

The Stockholm Convention deals with persistent organic pollutants (POPs) that are very stable, carbon-based chemical compounds and mixtures. These pollutants are classified as 'persistent' because they are not degraded easily in the environment by physical, chemical or biological processes. POPs are primarily pesticides, industrial products and by-products.

The Convention currently covers 12 compounds (pesticides, industrial chemicals and by-products), which are organic (carbon based) that resist degradation in the environment, bioaccumulate in fatty tissue, are semi-volatile, and are toxic to humans and wildlife. POPs are highly toxic substances found throughout the world (<http://www.pops.int/>). Banning the use and trade in these chemicals will provide considerable human health benefits, as it will stop them entering the food chain.

Objectives

Considering the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development, the objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants. The purpose of the Stockholm Convention is to restrict and eventually prohibit the production, use, emissions and import and export of highly toxic substances known as persistent organic pollutants (POPs).

Obligations of the Parties

The main provisions of the convention focus on the 3 major areas (Stockholm Convention, 2001):

- Intentionally produced POPs: with the aim to eliminate the production and use of all intentionally produced POPs: 9 chemicals are slated for elimination (Annex A) and DDT is slated for restricted use (Annex B).
- Unintentionally produced POPs: aiming at continuing minimization and, where feasible, ultimate elimination of total releases of chemicals in Annex C derived from anthropogenic sources (dioxins, furans, HCB, PCBs). Parties must develop action plans within 2 years of entry into force, and implement their plans.
- Stockpiles and waste: aiming at environmentally sound management (ESM) of stockpiles, wastes, and products and articles upon becoming wastes that consist of, contain or are contaminated by POPs

The general obligations of Stockholm Convention require parties to:

- Designate a National Focal Point
- Develop, implement and update an implementation plan
- Promote and facilitate a wide range of public information, awareness and education measures
- Encourage/undertake research, development, monitoring and cooperation on all aspects of POPs and their alternatives;
- Report all the measures taken by Party to implement the Convention and the effectiveness of the measures taken as well as data/estimates for total quantities of POPs in Annexes A & B that are produced and traded with the list of the States involved.

Summary of the obligations under the Stockholm Convention and the required actions to be implemented nationally are given in the Annex part.

2.2.5. The Rotterdam Convention

Adopted on 10 September 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands, the Rotterdam Convention (the Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade) entered into force on 24 February 2004. The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure, built on the voluntary PIC procedure that had existed and operated by UNEP and FAO since 1989. There are 73 signatories to the Convention to which Ethiopia is Party since January 9, 2003.

The Convention facilitates the sharing of information and prior informed consent among Parties to contribute to the environmentally sound management of 27 hazardous chemicals- 17 pesticides, 5 severely hazardous pesticide formulations and 5 industrial chemicals. Additional pesticides, industrial chemicals or formulations would be added as they meet the Convention's criteria.

The general commitment when a State is Party to the Convention is participation in the international information exchange in the trade of industrial hazardous chemicals, pesticides and pesticide formulations in order to protect human health and the environment from potential hazards. This Convention helped create a system that permitted developing countries to stop the import of certain substances if they felt a need to do so. Member countries can use the Rotterdam Convention to set up a mechanism to ban the import of certain pesticides and industrial chemicals from other countries that are Parties to the Convention. The pesticides and industrial chemicals are those that have been banned or severely restricted for health or environmental reasons in other countries. Developing countries are also encouraged to investigate and notify pesticides that are causing health or environmental problems under the conditions of use in their country, even though these pesticides may not be banned elsewhere.

The Rotterdam Convention is complementary to the Stockholm Convention, as both have listed some chemicals in common. The chemicals common to both Conventions include: Aldrin, Chlordane, DDT, Dieldrin and Polychlorinated biphenyls (PCBs). The synergistic implementation of such chemical-related Conventions would harmonize their implementation process and utilize scarce resources efficiently. PIC also provides basic information on chemicals, which may support the Basel, and the Bamako Conventions, which deal primarily with hazardous chemical wastes.

Objective of the Convention

The objective of this Convention is to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties.

Obligations and Rights under the Rotterdam Convention

Obligations and Rights include the establishment and strengthening of its national infrastructures and institutions for the effective implementation of this Convention. This may include, if required, the adoption or amendment of national legislative or administrative measures. Details are listed in Annex.

The major provisions of the Convention are summarized as follows:

- A national authority responsible for implementing the prior informed consent (PIC) procedure will need to be designated as a contact point for receiving information and carry out appropriate notification requirements on the production, export and imports of the chemicals listed under the Convention.
- Each Party is required to report on all chemicals that they have listed as banned or severely restricted substances arising from human health and environmental concerns.
- Developing countries are encouraged to report on pesticides causing health or environmental problems because of the conditions of use in their country.
- If a member country produces or exports chemicals that it has banned or restricted chemicals, they must inform the importing country.
- If a country produces or exports any chemicals included on the PIC List, they must ensure that the importing country has consented to its import.
- Parties need to respond to each chemical included on the PIC list with a decision of whether they prohibit or agree to its import.

The information requirements for notifications pursuant to Article 5 contained in Annex I of the Rotterdam Convention are:

- (1) Properties, identification uses including (a) Common name; (b) Chemical name according to an internationally recognized nomenclature (for example, International Union of Pure and Applied Chemistry (IUPAC)), where such nomenclature exists; (c) Trade names and names of preparations; (d) Code numbers: Chemicals Abstract Service (CAS) number, Harmonized System customs code and other numbers; (e) Information on hazard classification, where the chemical is subject to classification requirements; (f) Use or uses of the chemical; (g) Physico-chemical, toxicological and ecotoxicological properties, and
- (2) Final regulatory action (a) Information specific to the final regulatory action: (i) Summary of the final regulatory action; (ii) Reference to the regulatory document; (iii) Date of entry into force of the final regulatory action; (iv) Indication of whether the final regulatory action was taken on the basis of a risk or hazard evaluation and, if so, information on such evaluation, covering a reference to the relevant documentation; (v) Reasons for the final regulatory action relevant to human health, including the health of consumers and workers, or the environment; (vi) Summary of the hazards and risks presented by the chemical to human health, including the health of consumers and workers, or the environment and the expected effect of the final regulatory action; (b) Category or categories where the final regulatory action has been taken, and for each category: (i) Use or uses prohibited by the final regulatory action; (ii) Use or uses that remain allowed; (iii) Estimation, where available, of quantities of the chemical produced, imported, exported and used; (c) An indication, to the extent possible, of the likely relevance of the final regulatory action to other States and regions; (d) Other relevant information that may cover: (i) Assessment of socio-economic effects of the final regulatory action; (ii) Information on alternatives and their relative risks, where available, such as - Integrated pest management strategies; - Industrial practices and processes, including cleaner technology.

2.2.6. The Synergy of Four Chemical Conventions

Combined, the four chemical conventions; Vienna Convention/Montreal Protocol, Basel, Rotterdam and Stockholm can be seen as a series of building blocks that intermesh to create an holistic approach to hazardous chemical management. Each deal in one-way or another with a chemical that is hazardous to human health and the environment. Elements of each of these conventions overlap or interlink with the other conventions.

Collectively, the four chemical conventions cover a spectrum of actions necessary for the environmentally sound management of hazardous chemicals and wastes.

These include:

- Managing domestic waste in an environmentally sound manner;
- Identifying sites contaminated with hazardous chemicals;
- Soundly managing stockpiles of hazardous chemicals;
- Reducing and eliminating the release, use and production of persistent organic pollutants;
- Regulating the import of potentially hazardous chemicals;
- Avoiding the introduction of new hazardous chemicals;
- Regulating the transport and trade of hazardous and radioactive wastes;
- Protecting ozone layer depletion
- Promoting information exchange;
- Developing technical capacity building;
- Facilitating financial assistance for developing countries.

There is a distinct logic in developing this synergy further. For developing countries like Ethiopia, with limited human and financial resources, an integrated approach to hazardous chemicals and waste management is the logical way forward.

Collaboration among the stakeholders has the added benefit of:

- Efficiency in the use of the collective resources - information, financial and expertise;
- Effectively assessing and managing chemical hazards and risks;
- Reducing duplication and overlaps;
- Emphasizing program and policy coherence;
- Coordinating public participation;
- Improving customs service; and
- Averting fragmented sectoral initiatives.

The synergy of the four chemical conventions can provide Ethiopia with the cornerstone for improved domestic chemical management as well as stronger, more effective national frameworks.

National response to these synergies would focus on:

- Coordinating information management, including collecting, organizing and sharing data on chemicals;
- Standardized data collection and criteria;
- Facilitating capacity-building through training programs;
- Coordinating science and research;
- Promoting technology transfer;

- Seeking financial support for stakeholders;
- Developing comprehensive legislation at the national level;
- Developing public awareness programs on sound chemical management;
- Promoting public involvement in chemical management strategies;
- Assisting national governments in meeting reporting requirements;
- Facilitating meetings regarding the conventions; and
- Coordinating the policy development for chemical management regional strategies.

3. ETHIOPIA'S LEGAL AND POLICY FRAMEWORK FOR THE IMPLEMENTATIONS ENVIRONMENTAL CONVENTIONS

Over the past few years, there has been a growing perception and commitment towards an improved natural resources management and environmental protection in the country. Consequently, in order to address the environmental problems mentioned at the beginning of this paper and heading towards achieving sustainable development, the mechanism of environmental protection adopted by Ethiopia could be characterized by a three-stage approach *viz.* constitutional, policy and legislative measures.

3.1. The Constitution

The Constitution of the Federal Democratic Republic of Ethiopia, the supreme law of the country, has several provisions that are of relevance to the preparation of the strategic plan of action for the National Capacity Needs Assessment. Apart from the overall framework of national and regional development supported by the Constitution's diverse provisions, specific references to environmentally sustainable development are contained in Article 43 (the Right to Development) and Article 44 (Environmental Rights) in particular. Briefly these articles establish:

- i) The State's obligations to protect and ensure Ethiopia's right to sustainable development in all international agreements and relations concluded, established or conducted by the State; and
- ii) The peoples' rights to:
 - improved living standards and to sustainable development;
 - participate in development and to be consulted with respect to policies and projects affecting their community;
 - a clean and healthy environment;
 - commensurate monetary or alternative means of compensation, including reallocation with adequate state assistance, for being displaced or for their livelihoods being affected by government programs

3.2. The Major Policy Frameworks of Ethiopia

The overall policy goal of Ethiopia is to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. The major policy frameworks on which other policies have been based and that have an overall bearing on environment and development are discussed hereunder.

3.2.1. Agricultural Development-Led Industrialization (ADLI)

The framework economic development strategy of the current Ethiopian Government is the Agricultural Development-Led Industrialization (ADLI). The strategy envisages agriculture as the engine of the country's economic growth through agricultural intensification and commercialization, increasing the proportion of marketable output. In line with this strategy, the government has declared the pursuit of a liberalization policy, including the withdrawal of input subsidies, deregulation of different markets, tariff reduction, etc. Government efforts have continued to focus on rural development and measures to improve productivity of

smallholder peasant agriculture through “extension packages” as well as rural credit services, primary education, health care, domestic water supply and rural road construction.

3.2.2. Sustainable Development and Poverty Reduction Program (SDPRP)

The long-term objective of the country is elaborated in the document entitled "Sustainable Development and Poverty Reduction Program (SDPRP)". The program is designed to serve as the country's strategy to transform agriculture in the shortest time possible (FDRE, 2002). The program outlines the fundamental development objectives of Government to build a free-market economic system, which will enable the economy to develop rapidly, the country to extricate itself from dependence on food aid, and poor people to be the main beneficiaries from economic growth.

The strategy recognizes the importance of the environment and sustainable development and treats it as crosscutting issue. It points out three priority areas for action including strengthening and expanding on-going efforts to address land degradation, deforestation, overgrazing, soil erosion, loss of soil structure and the disruption of the hydro-logical cycle, giving special attention to highly degraded, drought prone and food insecure areas, strengthening regulatory and institutional capacity, strengthening measures currently under implementation to preserve, develop, manage and sustainable use biodiversity resources.

In adopting the United Nations Millennium Declaration, Ethiopia agreed to take special measures to address the challenges of poverty eradication and sustainable development in the country. The country recognizes that the range of issues necessary to nurture its environmental base and sustainable use of natural resources is vast and complex and that a systematic combination of initiatives is necessary to translate into action a coherent environment program. The capacity need assessment to achieve goal 7 of the MDG calls for the development and adoption of a coherent action plan and strategies - to ensure environmental sustainability while at the same time combating poverty and promoting socio-economic development.

3.2.3. Food Security Strategy (FSS)

Food security strategy is basically derived from the country's rural development policy and is adopted since March 2002. It aims at increasing domestic food production; ensuring access to food for food deficit households; and strengthening emergency response capabilities. It is recognized that soil, water, and vegetation are the main asset base of both the farming community and the country's economy as a whole without which the achievement of food security is unlikely. Water and natural resource conservation based agricultural development constitutes a central element of the strategy. The strategy has also given due attention to the problems of environmental degradation, population pressure and land shortage, particularly in moisture deficit highland areas of the country. Accordingly, water harvesting, proper land utilization and environmental rehabilitation are identified as top priority areas of intervention that help to combat drought and famine induced by environmental challenges such as desertification and land degradation. Thus, the food security strategy is designed taking into account the importance of conservation, rehabilitation and restoration of natural resources as an entry point to changing the existing dire livelihood situation in the rural household economy.

3.2.4 Water Policy and Strategy

The Ethiopian Water Resources Management Policy has clearly defined the fundamental principles and objectives under which the overall water resources development and management are to be based². According to the Water Policy, water is at the same time defined as a naturally endowed common good or property of the Ethiopian people. In addition, integration, comprehensiveness, participatory approach and decentralized management are some of the most important fundamental principles issued by the Government in the Water Policy.

The Ethiopian Water Sector Strategy is prepared recently to translate the Ethiopian Water Policy into action. It is better expressed as the 'road map' towards realizing the fundamental principles, objectives and goals of the policy. What actions, ways, and options should or would be taken to implement the various issued policy statements are clearly outlined and defined in the strategy document.

The Water Sector Development Program has a planning horizon of 15 years. The most important feature of the WSDP is the inclusion of priority projects from the already completed River Basin Master Plan Studies and other regional projects and programs that have been shelved for long due to lack of financial resources and weak institutional capacities. Another basic feature of the WSDP formulation is also the inclusion of the various projects under the Nile Basin Initiative (NBI), especially those projects that have been considered under what is called the Eastern Nile Subsidiary Action Program (ENSAP).

The Program preparation has been divided into the following main sub-sectors: Water supply and sanitation, Irrigation, Hydropower, General water resources and Institution/capacity building. Considering the above sub-sectors as the main components of the program, main program outputs have been developed. Accordingly, physical activities and associated investment needs have been allocated for each of the sub-sectors. The program has targeted to develop a total area of 274,612 ha of land under irrigation, boost the water supply coverage from 31 to 72% and increase the hydropower generation capacity by 950 MWh/yr. There are also water resource development and institutional capacity building targets, which could support the main sectors.

3.5. Millennium Development Goals (MDGs)

The Ethiopian Government and the UN country team in Ethiopia (an MDG task force) have embarked on a process of translating the Goals into the local context (Ethiopian context). The MDGs process had been harmonized and built upon the existing structures functioning for the Sustainable Development and Poverty Reduction Program (SDPRP). The contextual analysis has addressed the issue of MDGs harmonization with the existing government policies, strategies and programs and past performances. In terms of targets in SDPRP, targets related to poverty, hunger, education and health are well articulated and are nearly consistent with the MDGs.

MDGs for Ethiopia using the baseline figures available for the recent period have got eight key development goals accompanied by 18 quantifiable targets and 48 indicators. Goal 7 is devoted to Ensure Environmental Sustainability in the country. Environmental degradation in Ethiopia is closely related to the recurrence of droughts, food insecurity, and declining of farm productivity. Much of the hunger is expected to be due to

² Water has been for the first time recognized as an economic and social good.

human factor exploiting the environment in an unsustainable manner. Soil depletion, deforestation and absence of irrigation contributed to an alarming decline in the fertility of land, making farming a difficult and risky enterprise. This goal is the key to the reduction of hunger, starvation and poverty. Poverty in Ethiopia is highly correlated with vulnerability to environmental shocks. The MDGs identified three main targets in relation to this goal:

- a. Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources;
- b. Halve the proportion of people without sustainable access to safe drinking water by 2015, and
- c. Achieve a significant improvement in the lives of at least 100 million slum dwellers by 2020.

4. LEGISLATIVE MEASURES TAKEN TO ADDRESS ENVIRONMENTAL PROBLEMS

Based on the Constitution, which has defined the overall environmental values to be preserved and protected in the country, several measures have been taken to fulfill the commitments of the conventions and address environmental problems and alleviate their impacts on the society. Consequently, in order to address the environmental problems and heading towards achieving sustainable development, the Ethiopian Environmental Authority adopted several policy measures, strategies and action plans.

4.1. Strategies and Policy measures

The major policy measures that have been taken to address the aforementioned environmental problems include among others:

- Conservation Strategy of Ethiopia (1994)
- Environmental Policy of Ethiopia (April, 1997),
- Biodiversity Conservation and Research Policy (April 1998),
- Ethiopian Biodiversity Strategy and Action Plan (EBSAP)
- Water Resources Management Policy and Strategy (1999),

4.1.1. The Conservation Strategy of Ethiopia (CSE)

The Conservation Strategy of Ethiopia (CSE), which was formulated in 1994 (The National Conservation Strategy, Volume I – Volume V), provides an adequate umbrella strategic framework, detailing principles, guidelines and strategies for the effective management of the environment. It also elaborates state of resource bases of the country, as well as the institutional arrangement and action plans for the realization of the strategy. The EPE, which was approved in April 1997, is the result of the still continuing process of the CSE.

The CSE Report is prepared in 5 volumes. Volume I establishes the setting by evaluating the state of the natural resources, the environment and development in Ethiopia and examining the interconnected causes and effects of the existing situation. Volume II presents a policy and strategy framework aimed at ensuring a sustainable use and management of natural resources, rehabilitating those whose bases have suffered degradation and maintaining life support systems functioning well. Volume III deals with institutional questions that require to be answered to implement the strategies defined in Volume II.

Volume IV presents a plan of prioritised actions within the framework of 11 cross-sectoral and 11 sectoral programmes. Each Programme is divided into a number of components that are broad divisions for programming purposes. Prioritised actions have been formulated for each component, which translate the broad strategies outlined in Volume II into specific activities.

These activities have been prioritised into three, not necessarily exclusive, categories. Immediate priorities are those actions, which are deemed essential for immediate implementation and which can be accomplished within a period of two years. Medium-term priorities are those actions which can be started immediately or may be dependant on the completion of specific immediate actions, and which can be completed within a period of five years. Long-term priorities are actions, which require the completion of immediate, and/or medium-term actions and which will take a period of more than five years to complete. Each Programme is

divided into a number of components, which are broad divisions for programming purposes. For each component-prioritised actions have been formulated which translate the broad strategies outlined in Volume II into specific activities.

Volume V gives a listing of projects, some funded and being implemented, and others only proposed, with estimated costs. The projects have not been fully evaluated and prioritised in the context of the strategies defined in Volume II.

Most of the States of the Federation have also elaborated more specific Regional Conservation Strategies (RCSs) based on the CSE while the remaining are expected to do so soon. The CSE deals with eleven sectoral and eleven cross-sectoral issues.

The principles, guidelines and strategies set out in the CSE documents are expected to provide Ethiopia with an adequate umbrella strategic framework for the effective management of the environment including land degradation. Following the CSE all sector and cross-sector specific policies are reviewed in line with the strategy. The sectoral and cross-sectoral policy elements are listed in Annex.

4.1.2. The Environmental Policy of Ethiopia

Natural resource base of Ethiopia, which is the foundation of the economy supporting 85% of the population, is deteriorating rapidly. The rich natural and cultural heritages, which pervade every aspect of daily life, are under threat as a result of lack of protection. These call for concerted action to reverse the deterioration of the resource base and to promote a sustainable development that involves the progressive transformation of the economy and society to satisfy human needs and aspirations. This involves considerations of equity and access to resources and their distribution for the present and the future generation.

Because the Constitution of the FDRE ensures all Ethiopians the right to sustainable development and the right to a clean and healthy environment, Ethiopia had to develop a comprehensive environmental policy on natural resources and the environment so as to harmonize development with sustainability and to rehabilitate the degraded environment. The Environmental Policy also paved the way to adapting and ratifying several international conventions and agreements related to the environment some of which are pending enforcement by the Parties of the conventions. The Environmental Policy of Ethiopia was approved on April 1997 (The Environmental Policy of Ethiopia, 1997).

Objectives

The general objective of the Environmental Policy of Ethiopia is to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

Guiding Principles

The policy recognizes that the general and specific objective of the policy emanate from well articulated guiding principles which include the right to healthy environment, community empowerment, creation of enabling atmosphere, sustainable use of renewable resources, use of appropriate technology, long –term

economic development, security of land tenure, regular assessment and monitoring of environmental conditions, increased environmental awareness and interdependence on environmental issues at all levels.

EPE emphasize the need for arresting land degradation. The policy's section on Soil Husbandry and Sustainable Agriculture, Forest Wood Land and Tree Resource, Genetic Species and Ecosystem Biodiversity, Water Resource, Energy and Mineral Resource address the issue of combating desertification. The Policy constitutes ten sectoral and ten cross-sectoral policy elements for realizing the objectives.

4.1.3. The Biodiversity Conservation and Research Policy

The National Policy on Biodiversity Conservation and Research was issued on April 1998. The policy is formulated based on the rationale that conservation of biodiversity is one of the conditions of the overall socioeconomic development and sustainable environmental management goals. It provides a general framework towards effective conservation, rational development and sustainable utilization of genetic resources.

The objectives of the National Policy for Biodiversity Conservation and Research are to:

- ensure that the Ethiopian plant, animal and microbial genetic resource and essential ecosystems as a whole are conserved, developed, managed and sustainable utilized;
- assert national sovereignty over genetic resources and develop a mechanism for a fair exchange, safe movement and proper management of these resources;
- enrich the genetic resources of the country through introduction (from abroad and within the country), repatriation and restoration in accordance with the laws and regulations of the country and according to bilateral and/or multilateral agreements the country had made;
- build national scientific capacities and capabilities to explore, collect, conserve. Characterize, evaluate and utilize the biodiversity of the country;
- integrate biodiversity conservation and development programs into Federal and Regional agricultural, health, industrial and overall national economic development strategies and plans;
- recognize, foster and augment the indigenous know ledge and methods relevant to the conservation, development and sustainable use of biodiversity, and promote and encourage the development and putting into practice of new emerging technologies such as biotechnology;
- encourage the participation and support of local communities in biodiversity conservation, development and utilization. Furthermore, ensure that they share the benefit accrued as a result of using indigenous knowledge and/or germplasm;
- create a functional and efficient organizational structure to ensure inter institutional linkage and coordination in biodiversity conservation, development and utilization;
- promote regional and international cooperation in biodiversity conservation, development and sustainable use;

4.1.4. Ethiopian Biodiversity Strategy and Action Plan (EBSAP)

The Ethiopian Biodiversity Strategy and Action Plan has been prepared in response to one of the national obligations of the CBD in May 2004 by the IBC. It provides a brief assessment of the status and trend of the nation's biodiversity and outlines strategic goals and objectives for proper biodiversity conservation and utilization in Ethiopia. The major goals of EBSAP are:

- create a policy framework that fosters the sustainable use of biological resources and the maintenance of biodiversity;
- strengthen and promote National Biodiversity Conservation programs and develop international and regional co operations;
- create conditions and incentives for biodiversity conservation at the local community levels;
- strengthen and apply more broadly the tools and technologies for conserving biodiversity; and
- strengthen human knowledge, will and capacity to conserve biodiversity.

The action plan sets out a strategy for action under 14 main components which to a large extent correspond to the articles of the CBD: planning and policies, legislation, identification and monitoring, *in situ* conservation, *ex situ* conservation, sustainable use, incentive and disincentive measures, research and training, public education and awareness, environmental impact assessment, access and benefit sharing, exchange of information, financial resources and knowledge transfer. For each component, the issues relevant to the country are identified and a list of strategic objectives and corresponding actions are recommended.

Overall responsibility for implementation of the EBSAP at the federal level will be that of the IBC under the umbrella of the Ministry of Agriculture and Rural Development. The ministry has to establish a Federal Biodiversity Steering Committee of relevant institutions. The plan proposes the establishment of Biodiversity Secretariat within the Regional Bureaus of Agriculture and Rural Developments to coordinate EBSAP implementation and foster linkages between, and within, different sectors affecting biodiversity. The Regional Secretariats would report to a Federal Biodiversity Steering Committee and receive technical support from a broad-based, re-notified Biodiversity Working Group. Since most implementation measures will take place at the regional level, the plan also proposes Regional Steering Committees to be constituted.

4.2. Proclamations and Guidelines

The formulation of environmental protection laws (proclamations and guidelines) so as to meet the objectives fixed by the Constitution and the Environmental Policy as well as the Conservation Strategy of Ethiopia and the environmental Conventions to which Ethiopia is a party. In this regard the most important proclamations are briefly summarized as follows.

4.2.1. Environmental Organs Establishment Proclamation

The Environmental Organs Establishment Proclamation, Proclamation No. 295/2002, was enacted in 2002. This proclamation repealed Proclamation for the Establishment of the EPA (Proclamation No. 9/95).

The proclamation re-establishes the Environmental Protection Authority, EPA, as an autonomous public institution is accountable to the Prime Minister. The powers and duties of the EPA are described in detail in Part Two of the Proclamation. Part Two of the Proclamation stipulates the mandatory need for the establishment of environmental units and agencies by sectorally and regionally in order enable institutions the coordination of environmental activities, elimination of duplication of efforts and enhancement of disseminating environmental information. The Proclamation also establishes the Environmental Protection Council (EPC) to oversee EPA's activities, and defines the activities of sectoral agencies and environmental units with respect to environmental management. It also ensures coordination among sectoral ministries and agencies on environmental matters.

Proclamation No. 295/2002 (Part Two, sub-Article 6, section 9) mandates the EPA, in consultation with competent agencies, to formulate, or initiate and coordinate the formulation of policies, strategies, laws, and programs to implement international environmental agreements. In accordance with Part Two, sub-Article 6, section 8 of this Proclamation, the authority has also a mandate of taking part in the negotiations of international environmental agreements to lead to the process government ratification.

4.2.2. Environmental Impact Assessment (EIA) Proclamation

Proclamation No. 299/2002, enacted in 2002 (Environmental Impact Assessment Proclamation, 2002), empowered the EPA to prepare procedure, regulations, guidelines and standards to effectively implement and enforce EIA proclamation. Environmental guidelines are among the tools for facilitating the inclusion of environmental issues and principles of sustainable development into development proposals. To guide mainstreaming of the principles of sustainability into sectoral projects, sectoral environmental impact assessment guidelines such as gridlines on agriculture, transport, industry, tannery and settlements have been prepared.

In addition to these, a general guideline for facilitating EIA in all sectors has been prepared. The fundamental purpose of this guideline is to ensure that proponents, the government and all other interested and affected parties have the opportunity to participate meaningfully in the EIA process. Since the guideline explicitly states the responsibilities of each party, it helps to eliminate problems that may arise from lack of understanding of the process, from acting beyond one's mandates and responsibilities as well as from negligence.

4.2.3. EIA Guidelines

Economic, social and environmental change is inherent to development. Whilst development aims to bring about positive change it can lead to conflicts. In the past, the promotion of economic growth as the motor for increased well-being was the main development thrust with little sensitivity to adverse social or environmental impacts. The need to avoid adverse impacts and to ensure long-term benefits led to the concept of sustainability. This has become accepted by Ethiopia as an essential feature of development since the environmental vision of Ethiopia is increased well being and greater equity in fulfilling basic needs is to be met for this and future generations.

In order to predict environmental impacts of any development activity and to provide an opportunity to mitigate against negative impacts and enhance positive impacts, the environmental impact assessment (EIA) guideline was developed in the 2000 (Environmental Protection Authority, 2000). In this respect an EIA may be defined as: a formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects. EIA thus has three main functions:

- to predict problems,
- to find ways to avoid them, and
- to enhance positive effects.

EIA is therefore a management tool for planners and decision makers and complements other project studies on engineering and economics. Environmental assessment is now accepted as an essential part of

development planning and management. It is now as familiar and important as economic analysis in project evaluation.

The aim of any EIA should be to facilitate sustainable development. Beneficial environmental effects are maximized while adverse effects are ameliorated or avoided to the greatest extent possible. EIA will help select and design projects, programs or plans with long-term viability and therefore improve cost effectiveness.

A general guideline has been prepared in May 2000 by the Ethiopian Environmental Protection Authority for facilitating EIA in all sectors. The fundamental purpose of this guideline is to ensure that proponents, the government and all other interested and affected parties have the opportunity to participate meaningfully in the EIA process. Since the guideline explicitly states the responsibilities of each party, it helps to eliminate problems that may arise from lack of understanding of the process, from acting beyond one's mandates and responsibilities as well as from negligence.

To guide mainstreaming of the principles of sustainability into sectoral projects, sectoral environmental impact assessment guidelines such as on agriculture, transport, industry, tannery and settlements have also been prepared. The enforcement mechanisms, however, are not in place, which requires further consideration. Trained manpower in the areas of EIA is also critically constrained.

4.2.4. Pollution Control Proclamation

The Environmental Pollution Control Proclamation (Proclamation 3003/2002) prohibits the release of pollutant into the environment by any person engaged in any field of activity. Any person who causes any pollution shall be required to clean up or pay the cost of cleaning up the polluted environment. Installation of a sound technology that avoids or reduces, to the required minimum, the generation of waste and, when feasible, recycling of waste is encouraged. Further, the proclamation stipulates that permit is required to generate, keep, store, transport, treat or dispose any hazardous waste. Under this proclamation, the importation, preparation, keeping, distribution storage, transportation or use of a chemical categorized as hazardous or of restricted use, shall be subject to a permit from the Authority or the relevant regional environmental agency or from any other competent agency. Any person engaged in the preparation, production manufacturing or transportation or in trading of hazardous or restricted chemical may ensure that the chemical is registered, packed and labeled as per the applicable standards (Proclamation N0.300/2002, 2002).

In consultation with competent agencies, the Authority shall formulate practicable environmental standards based on scientific and environmental principles.

- Standards for the discharge of effluents into water bodies and sewage systems.
- Air quality standards that specify the ambient air quality and give the allowable amounts of emission for both stationary and mobile air pollution sources.
- Standards for the types and amounts of substances that can be applied to the soil or be disposed of on or in it.
- Waste management standards specifying the levels allowed and the methods to be used in the generation, handling, storage, treatment, transport and disposal of the various types of waste.

Pollution Control and Environmental Quality Guideline (2004)

According to the Environmental Pollution Control Proclamation (Proclamation No. 300/2002), EPA will be responsible to formulate practicable environmental standards based on scientific and environmental principles, in consultation with other competent agencies (Article 6(1)). As per this proclamation, the EPA has prepared Provisional Standard for Industrial Pollution Control (EPA, 2003) and Draft Proposal of Ambient Environmental Standards (EPA, 2004), and regulation for the enforcement of the standards in Ethiopia. National regional states may, based on their specific situation, adopt environmental standards that are more stringent than those determined at the federal level (Article 694).

In the Provisional Standard for Industrial Pollution Control, two approaches were suggested for the industries to implement the standards. The first approach is cleaner production, which can reduce pollution significantly, but it is voluntary activity by industries. It suits its purpose if the industries implement it and as a result, the effluent discharge limit is met. The second approach is the use of Best Available Technologies/or Techniques as last option, which is end-of-pipe control measure, and the choice, performance, expertise and treatment cost of the recommended technology are some of the important factors that are considered. While the standards apply to both new and existing industries, strategies were designed to improve the performance of the existing industries to bring them to the level where they can achieve the discharge limit.

4.2.5. Biosafety Framework

UNEP started to help build capacity through GEF funding long before the negotiations on the Cartagena Protocol on Biosafety. The "UNEP/GEF Pilot Biosafety Enabling Activity Project" had aimed at helping "selected countries in the development of national Biosafety frameworks" based on the UNEP Guidelines on Biosafety.

These frameworks were overtaken by events and they now need further development owing to the finalization of the more comprehensive and legally binding Cartagena Protocol on Biosafety as against voluntary guidelines.

UNEP/GEF has now launched a new Biosafety capacity-building project to involve 100 developing countries. "The main Objective of this National Project is the preparation of National Biosafety Frameworks in accordance with the relevant provisions of the Cartagena Protocol on Biosafety."

Ethiopia has recently formulated its Biosafety Framework using the UNEP/GEF financial support. The framework consists of an administrative system, a decision-making system that includes risk assessment and management, mechanisms for public participation and information and a regulatory system. When this framework is fully implemented all the systems needed to enforce the Cartagena Protocol and those regulations specific to Ethiopia will have been worked out. A national Biosafety framework chart that depicts the hierarchical relationships among the stakeholders in Application for introduction of GMOs into Ethiopia and/or research on GMOs is proposed. The institutional framework for Biosafety regulation to be developed shall include a National Decision Making Body, a Biosafety Administration Office, a Scientific Advisory Committee, a Scientific Review Committee, a Public consultation Process An Appeal Process and Inspection Process. Both the technical and the legal components of the framework have been reviewed at various levels and are pending a final approval.

The legal aspect of the framework emphasizes on the precautionary principle and the associated liability and redress for damages incurred either by inadvertent or unforeseen damages to the environment or human or animal health due to introduction of GMOs. The systems such as risk assessment and risk management that the Framework hopes to put in place are inadequate in Ethiopia. To make the National Biosafety Framework function effectively, cooperation among countries in the Region and establishing other bilateral agreements are necessary. These actions will maximize the usefulness of the existing limited capacity and will also help to initiate long-term training to reinforce the current situation.

4.3. Institutional Measures

A number of Government institutions share responsibility for the implementation of the environmental and sustainable development obligations and safeguarding of rights contained in the various conventions and protocols described earlier. The most relevant institutions with full and direct responsibility regarding environment among others are:

- Federal Environmental Protection Authority (EPA), and its replicas in Regional States,
- Institute of Biodiversity Conservation (IBC), and
- National Metrological Service Agency.

In addition, several other government institutions, non-governmental organizations and community-based organizations are engaged in rehabilitation and development programs that include environmental and natural resource management activities. Activities of private sector establishments, particularly those in the industrial sector associated with the use or production of chemicals, have an important bearing on the environmental obligations that Ethiopia has to meet under the conventions.

4.3.1. Government Institutions

4.3.1.1. Environmental Protection Authority

Environmental Organs Establishment Proclamation (Proclamation No. 295/2002) was enacted in 2002. This proclamation repealed Proclamation for the Establishment of the EPA (Proclamation No. 9/95). According to this proclamation EPA is accountable to the Prime Minister. This proclamation has also established the Environmental Protection Council (EPC). EPC oversees EPA's activities, as well as the activities of sectoral agencies and environmental units with respect to environmental management. It also ensures coordination among sectoral ministries and agencies on environmental matters. This proclamation also mandates the EPA to undertake studies and research, to develop action plans etc, in the area of combating desertification.

The main objective of the Authority is to ensure that all matters pertaining to the country's social and economic development activities are carried out in a manner that will protect the welfare of human beings as well as sustainably protect, develop and utilize the resource bases on which they depend for survival.

Vision and Mission

EPA's vision is a future Ethiopia where degraded renewable natural resources are rehabilitated, productivities of ecosystems are optimized and Ethiopians have attained a healthy and sustainable livelihood (EPA, 2001). Its mission is to promote the use of environmental resources in an optimum way to bring about sustainability into development and thus ensure the best environment possible for present and future generations of Ethiopia.

Powers and Duties of EPA

The Authority has the following powers and duties:

- prepare environmental protection policy and laws; and, upon approval, follow up their implementation;
- prepare directives and systems necessary for evaluating the impact of social and economic development projects on the environment; follow up and supervise their implementation;
- prepare standards that help in the protection of soil, water and air as well as the biological systems they support, and follow up their implementation;
- carry out studies required to combat desertification and, in cooperation with the concerned organs, create favorable conditions for their implementation;
- make recommendations on the application of diverse encouragement and regulatory measures for the better protection of the environment;
- provide instruction required to enhance awareness of the need for environmental protection;
- follow up the implementation of international treaties on environmental protection to which the country is a party;
- render advice and technical support to Regions on environmental protection;
- own property, enter into contracts and sue and be sued in its own name;
- carry out such other activities as are necessary for the fulfillment of its objective.

In order to execute the duties and responsibilities described above, EPA has six departments, six services, one information center, and one regional coordination office. It has a total of 134 employees out of which 2 with Ph.D., 17 with M.Sc./MA, 31 with B.Sc./BA and 29 with diploma. Compared with the powers and duties vested upon the Authority, the numbers of qualified staffs are below expectations.

4.3.1.2. Institute of Biodiversity Conservation (IBC)

Realizing the need for biodiversity conservation and its sustainable use, the Ethiopian Government upgraded the former Plant Genetic Resources Center to the Institute of Biodiversity Conservation and Research (IBCR) by Proclamation No. 120/98. IBCR was recently re-established as the Institute of Biodiversity Conservation (IBC) by Proclamation No. 381/2004.

Objective

The general objective of the Institute is to undertake conservation and promote the development and sustainable utilization of the country's biodiversity.

Vision

The vision of IBC is "to see that the biodiversity of Ethiopia is properly conserved, studied and sustainably utilized for social and economical developments to improve the lively hood of Ethiopians".

Mandate and duties

Ethiopia has set clear national policy directives on conservation of biological resources in this country. As of June 1998, the mandate of the Institute has been expanded to cater not only for plant genetic resources but

also for animal and microbial genetic resources. Ecosystem management is also recognized as one of areas to be given top priority. Given the importance of biodiversity and our dependence on biological resources, these biological conservation efforts give emphasis to local and national needs and values. The Institute has power and duties related to the conservation, research and utilization of biodiversity including maintaining and developing international relations with bilateral and multilateral bodies having the potential to providing technical assistance for the support of biodiversity conservation and development. The Institute on the basis of its national legislation has the responsibility and duty to implement CBD to which Ethiopia is a party.

4.3.1.3. National Meteorological Services Agency (NMSA)

The National Meteorological Service Agency was proclaimed as an autonomous public agency with its own juridical personality by proclamation 201/1980.

Vision and Mission

The vision of NMSA is to become a world-class meteorological service in Ethiopia.

The missions of NMSA are:

- to collect, analyse and study the atmosphere,
- to provide weather forecasts and early warnings on the adverse effects of weather and climate in Ethiopia

Objectives

The objectives of NMSA are:

- Investigate and study the weather and climatic conditions of Ethiopia
- Protect and control the atmospheric environment of Ethiopia
- Discharge international obligations regarding meteorology

Based on the objectives aforementioned, NMSA has established national network of meteorological stations designated to represent the various climatic regions of Ethiopia and to satisfy the needs of the various national development plans and activities. The agency collects meteorological data and is committed to exchange and disseminate information in accordance with the international agreements, provide early warning on adverse weather conditions, disseminate advice and educational information through mass media and provide meteorological services. The agency, on the basis of its national legislation, has the responsibility and duty to implement UNCC to which Ethiopia is a party.

4.3.1.4. Ministry of Agriculture and Rural Development (MOARD)

Proclamation No. 300/2004 issued on 13th January 2004 amended the proclamation for the reorganization of the Executive Organs of the Federal Democratic Republic of Ethiopia, Proclamation No. 256/2002. Thus, the MOARD replaced the former Ministry of Agriculture and Ministry of Rural Development. The powers and duties vested in the new ministry includes, among others, conservation and utilization of forest and wildlife resources, food security program, water harvesting and small-scale irrigation, monitoring events affecting agricultural development and early warning system, enhancing market led agricultural development, issue guidelines and procedures for agricultural input evaluation and release, ensuring the distribution of high

quality agricultural inputs to users, and establishing and directing training centers of agriculture and rural technology.

The Ministry is working to solve chronic problems associated with: deforestation, land degradation, lack of land use planning, decline in crop & animal production, dependency on biomass fuels, and lack of alternatives livelihoods, etc. The Ministry on the basis of its national legislation has the responsibility and duty to implement CITES and PIC to which Ethiopia is party through its two departments *viz.* Wildlife Conservation and Plant Protection Departments.

4.3.1.4.1. Department of Wildlife Conservation

Wildlife Conservation Department was established in 1964 in the Ministry of Agriculture and in 1970 received recognition as Ethiopian Wildlife Conservation Organization (EWCO). Since its establishment EWCO has established National Parks, Wildlife reserves, Wildlife Sanctuaries and Controlled Hunting areas and a considerable success has been gained.

Later in 1980, the State Forestry Department and EWCO joined to form an organization called the Forestry and Wildlife Conservation Authority with the proclamation of 192/1980.

The objectives of the Wildlife Conservation Department are:

- to ensure the proper protection, development, rational utilization and management of wildlife and forest resources;
- to establish National Parks and Game Reserves; and
- to participate the local communities in the conservation of NPs, etc.

Ministry of Agriculture and Rural Development has finalized a draft policy on endangered wildlife and wildlife products transport and trade with the aim of:

- protecting Ethiopia's wildlife resources, develop properly, manage and utilizing sustainably for the economic development of the country;
- maintaining the government obligations under international treaties and other agreements concerning the protection, conservation or utilization of wildlife resources and habitats.

4.3.1.4.2. Department of Plant Protection

The Department of Plant Protection under the Ministry is responsible for the registration and control of pesticides in the country. Its mandate is based on the following proclamations and regulatory guidelines:

- Pesticide and Control Decree No 20/1990;
- Proclamation on Reorganization of Executive Organs of Federal Democratic Republic of Ethiopia/Amendment proclamation No 256/2001;
- Guidelines on fees in relation to Pesticides import, license and registration; and
- Guideline on Pesticide Registration January 1999.

The Department is the implementing office of the Rotterdam Convention.

4.3.1.5. Ministry of Capacity Building (MOCB)

The Proclamation for the reorganization of the Executive Organs of the Federal Democratic Republic of Ethiopia, Proclamation No. 256/2002 established Ministry of Capacity Building. Under the National Capacity Building Program, there are currently 14 sub-programs. Out of these sub-programs: District Level capacity building; establishment of Agricultural, Technical, Vocational & Educational Training (ATVET); the Cooperative Development Program; the Information Communication Technology (ICT) service through the establishment of government information network and community based information system and services; and Civil Society and NGO capacity development programs are directly relevant to combating desertification and mitigating the effects of drought. However, the environmental aspects of all such capacity building activities are not properly addressed.

4.3.1.6. Ministry of Infrastructure Development (MOID)

The Ministry of Infrastructure Development [MOID] is mandated for all issues of infrastructure development, which includes: road development through the Ethiopian Road Authority (ERA), generation and distribution of electric power through the Ethiopian Electric Power Corporation (EELPCo), postal service, telecommunication services.

4.3.1.6.1. The Ethiopian Road Authority (ERA)

The Ethiopian Roads Authority, ERA, was reestablished in 1997 with proclamation no. 80/1997. The first Ethiopian government road construction authority was established in 1951 as the Imperial Highway Authority. ERA is currently engaged in planning, construction, maintenance and contract administration for road construction.

The Ethiopian Roads Authority has started environmental consideration in all road projects. On this basis, an Environmental Procedures Manual has been prepared for use by all stakeholders involved in the development of the main road network of the country.

The strategies of the Ethiopian Roads Authority are:

- Improve and expand the road network in an environmentally friendly way
- Capacity building of the staff of the in general, and the Environmental Monitoring and Safety Branch in particular, and
- Prolonged and sustainable cooperation with development partners and other relevant stakeholders.

The Environmental Monitoring and Safety Branch, established in 1998, is an integral part of the institutional framework of the ERA with an objective to undertake environmental monitoring activities for both contract and own work force projects of the Authority. The branch is currently staffed with an engineer, an ecologist and sociologists.

With regard to the environment and safety, the Authority produced the following manual and policy documents:

- Environmental Procedures Manual
- Resettlement Framework Policy
- Work place HIV/AIDS Policy

4.3.1.6.2. Ethiopian Electric Power Corporation (EEPCO)

Ethiopian Electric Power Corporation (EEPCO) was reestablished in 1997 by proclamation 18/1997. The previous organization was the Ethiopian Electric Power Authority (EELPA) established in 1948. Environmental Monitoring Unit has been established in 2002 at the head office and produced the following Policy Documents:

- The EEPCO drafted an operational environmental manual “Environmental Guideline for the Power Sector” (second edition, December 2004 which addresses issues of environmental problems related to the power sector on the basis of the national environmental policy and legal framework which includes the FDRE constitution, Environmental Policy of Ethiopia, Conservation Strategy of Ethiopia and all the environmental proclamations (e.g. Proclamations Numbers 299/2002, 295/2002, 300/2002, 401/2004, 92/1994, 94/1994);
- Strategic Plan 1997-2002, EEPCO

With regard to potential impacts and mitigating measures to be taken, the guideline has environmental considerations related to:

- Hydro-power projects
- thermal power plant construction
- transmission line erection
- sub-station construction
- coal energy
- Operational activities
 - Chromium Copper Arsenic, CCA –as a wood preservative
 - Polychlorinated biphenyls, PCBs (one of the POPs) used as dielectric fluid in oils for transformers, capacitors, voltage regulators etc.

4.3.1.7. The Ministry of Trade and Industry (MOTI)

The Ministry of Trade and Industry (MOTI) has been restructured by proclamation 256/2001. MOTI, among many others, has powers and duties to

- provide business registration, licensing and regulatory services, as well as
- cause the expansion of quality and standardization services.

The vision MOTI is to secure globally competitive trade and industrial sector that would be well founded on the basis of consistent development and growth. Its mission is to promote and expand the development of trade, industry and investment in the country by creating conducive enabling environment to the developmental forces and render transparent and efficient services and supports.

One of MoTI’s powers and duties is establishing quality management system and environmental management system. The ministry is working towards the implementation of ISO 9001 and 14001 certifications. It has also projects on Cleaner Industrial Production; Research on leather and textile at the Leather products Technology Institute

MOTI implements the Chemical Weapons Convention: The Chemical Weapons Convention entered into force in April 1997. Ethiopia became party to the Convention on 13 January 1993. The Minister of

Commerce and Industry is the national focal point to the Organization for the Prohibition of Chemical Weapons in The Hague, the Netherlands –the Technical Secretariat that implements the Chemical Weapons Convention. Under the Convention are three sets of chemicals –chemical warfare agents and their precursors. These toxic chemicals and their precursors are used for chemical weapons together with munitions or any equipment or separately are prohibited and/or controlled except where intended for purposes not prohibited under the Convention.

Obligations and rights under the Convention: Article I, among others, prohibit to develop, produce or otherwise acquire stockpile or retain chemical weapons (CWs), and prohibits the use chemical weapons and engagement in military preparation to use CWs.

Article X: relates to rights of State Parties to receive assistance and to develop capacity for protection against chemical weapons.

Article XI: guarantees the rights of State Parties to develop chemistry and chemical technology for peaceful applications.

Stakeholders include the Ministry of Foreign Affairs, the Ministry of National Defense, the Ministry of Health, the Ministry of Agriculture, the Environmental Protection and Authority, Customs Authority of Ethiopia.

Proclamation to implement the Convention on Prohibition of the development, production, stockpiling and use of chemical weapons and on their Destruction (Proclamation No. 331/2003) is the enforcing legislative of the convention.

4.3.1.8. Ministry of Water Resources (MOWR)

The Federal Ministry of Water Resources and the Regional Water Bureaus have taken a number of reform measures to deal with the problems, constraints, issues, challenges and opportunities of the Ethiopian water sector. The Ethiopian Water Resources Management Policy has clearly defined the fundamental principles and objectives under which the overall water resources development and management is to be based. According to the Water Policy, water is at the same time defined as a naturally endowed common good or property of the Ethiopian people (MoWR, 2002). In addition, integration, comprehensiveness, participatory approach and decentralized management are some of the most important fundamental principles that have direct concerns on the environmental issues.

Another important initiative that has been put in place is the Ethiopian Water Sector Strategy. In the context of Ethiopia, the Water Sector Strategy is defined as a means to translate the Ethiopian Water Policy into action. It is better expressed as the ‘road map’ towards realizing the fundamental principles, objectives and goal of the policy. What actions, ways, and options should or would be taken to implement the various issued policy statements are clearly outlined and defined in the strategy document.

The Water Sector Development Program has a planning horizon of 15 years (MoWR, 2002). The most important feature of the WSDP is the inclusion of priority projects from the already completed River Basin Master Plan Studies and other regional projects and programs that have been shelved for long due to lack of financial resources and weak institutional capacities. Another basic feature of the WSDP formulation is also

the inclusion of the various projects under the Nile Basin Initiative (NBI), especially those projects that have been considered under what is called the Eastern Nile Subsidiary Action Program (ENSAP).

4.3.1.9. Ethiopian Investment Commission (EIC)

The Ethiopian Investment Commission [EIC] established by Proclamation No. 373/2003, serves as a nucleus for matters of investment and promote, coordinate and enhance activities thereon; initiate policy and implementation measures needed to create a conducive investment climate for investors and follow up their implementation; issue investment permits; monitors the implementation of investment projects for which it has issued permits; ensures that the terms of the investment permits are complied with; and approves and registers technology transfer agreements related to investments.

4.3.1.10. Government Higher Learning Institutions (HLI)

Higher Learning Institutions [HLI] are engaged in activities relevant to environmental problems. The Addis Ababa University has launched Post-graduate study in Environmental Sciences, which offer courses in all major areas of environmental issues.

The programs that are initiated include:

- Masters of Science in Environmental Science which is hosted by the Faculty of Science (Since 2003)
- Masters of Science in Environmental Engineering which is hosted by the faculty of Technology (Since 2005)
- Master of Arts in Environment and Development which is hosted by the Institute of Development Research in the Faculty of Social Sciences (since 2005)

Along with these programs various researches have been initiated under the respective graduate programs.

Further more the Addis Ababa University is offering various courses in environmental chemistry, environmental ecology, and Industrial Chemistry at undergraduate level. The Mekelle University has an Undergraduate program for Environment and Natural Resource studies and is running projects on dry land agriculture and conservation, and the Debu University, Jimma University and Gondar Universities have Departments in Environmental Health. The Arbaminch University has various environmental components particularly in the field of water resources and water quality management.

All these efforts indicate that environmental issues are gaining considerable attention by higher learning institutions, which will support the trained manpower requirements of the institutions dealing with environmental problems.

4.3.1.11. Ethiopian Cleaner Production Center (ECPC)

The ECPC was founded in April 2000 hosted under the ESTC support cleaner production projects that enable industries to conserve raw materials, eliminate toxic raw materials and to reduce toxicity of emissions and wastes in order to enhance reduced negative environmental impacts of products during production and their entire life cycle. In April 2005, the ECPC has recorded a success story for enabling the establishment of environmental management systems (EMS) for 5 important industries, namely

- Dashen Brewery

- Meta Abo, Brewery
- Gloving and Hide Unit of the Ethio Leather Industry PLC
- Ethiopia Tannery S. Co. and
- Combolcha Textile

The EMS international certifications were made against the ISO 14001 standard (ECPC, Ethiopian Experience on Environmental Management Systems Implementation towards ISO 14001 Certification, April 2005, Addis Ababa)

The ECPC is currently selecting 12 industries for EMS certification projects for the coming one year.

4.3.2. NGOs/CBOs

There are more than 650 registered NGOs/CBOs in Ethiopia. These NGOs and CBOs are engaged in various fields including environmental protection and natural resource management. Recently they have established a network, called Ethiopian NGOs/CBOs Coordination Committee for Combating Desertification (ENCCD). The area of participation in environmental related activities of the NGO/CBO is shown in Table 2.

The ENCCD is a network that promotes UNCCD/NAP implementation in the country. Some of the major activities accomplished by ENCCD are: maintain network among its members and other organizations working in the field; share various information and experiences related to UNCCD/NAP implementation; provide information and feedback on different studies conducted in association to ENCCD performance and UNCCD/ NAP implementation; Participate in training and awareness raise activities to popularize UNCCD/NAP; Participate in several meetings representing NGO/ CBOs nationally and internationally

Table 2. Area of participation in environmental related activities of the NGO/CBO

AREA	NO
Advocacy	48
Agriculture	70
Biodiversity	36
Biosafety	15
Climate	14
Desertification	29
Energy	34
Environmental Education	70
EIA	37
Forestry	62
Pollution	33
Sanitation	9
Soil And Water Conservation	60
Wildlife	18
Population	30
Public Interest Litigation	8

4.3.3. The Industrial Sector

Industries producing basic chemicals in Ethiopia are very few as compared to the industries in developed countries. Indicative summary of the number of industries are shown in Table 3.

Table 3 Total numbers of major industries in Ethiopia

Industrial sector	Number of industries
Textile	15
Tanneries& Leather	10
Chemical	10
Pesticides formulation	1
Sugar	2
Cement	2
Beverages	11
Plastic & Rubber processing	4
Paints and varnish	4
Pharmaceuticals	8
Metal industries	6

Most of the chemicals used for industrial applications are imported, and therefore, the chemical needs of the country for the various economic activities are mostly satisfied through import. On the other hand, record keeping by firms on chemical production, import, use and/or obsolete chemicals is weak. Although the extent of development of heavy industries is very low in the country, small-scale activities such as garages and dry cleaning houses are widely distributed in the major urban centers in Ethiopia. The performance of industries in terms of waste minimization, emission control and energy efficiency is reported to be very poor.

The future development of industrial sector in Ethiopia strongly depends on the current strategy on economic liberalization and privatization. Accordingly, it is anticipated that the number of both large scale and small-scale industries will increase in the near future. However, lack of adequate legislative framework with strong enforcement mechanisms is the major concern regarding environmental pollution by hazardous substances.

5. THE STATUS AND ACHIEVEMENTS OF THE CONVENTIONS

5.1. The Status of the Rio Conventions

Over the past several years, Ethiopia has made some notable progress toward implementing the three Rio conventions and the achievements obtained from implementing each of the conventions are described hereunder.

5.1.1. The Convention on Biological Diversity (CBD)

The principal activities being undertaken to implement the convention are summarized as follows.

- ***Ex situ* conservation**

Since the establishment of the Institute (former Plant Genetic Resources Center of Ethiopia) in 1976 systematic crop germplasm exploration and collection operations have been undertaken in the different administrative regions of the country, covering a wide range of agro-ecological conditions by setting priorities based on the economic importance, degree of genetic erosion, degree of genetic diversity, etc. of the crop species. Over the years there are about 59000 accessions of 103 species in the Gene Bank as *ex-situ* conservation. About 90% (about 53,900 accessions) of the total germplasm holdings in the Gene Bank (60,648 accessions) are field crops.

- **Community based *in situ* conservation initiative**

A project entitled 'A Dynamic Farmer Based Approach to the Conservation of Ethiopia's Plant Genetic Resources' funded by the Global Environment Facility (GEF) was initiated in 1994 addressing a neglected aspect of plant diversity that of indigenous crop varieties maintained by farmers in dynamic agro-ecosystems. This community-based *in situ* conservation project is designated to link farming communities and their varieties with the existing formal genetic resources conservation efforts of the Institute of Biodiversity Conservation and Research by means of establishing community gene banks.

In this project, twelve on-farm *in situ* conservation sites and community gene banks have been established for farmers' varieties in six agro-ecological regions. Farmer Conservator Associations have been formed for each *in situ* conservation site. Agro-morphological, nutritional, biochemical and ethnobotanical studies were conducted on some of the crop species under *in situ* conservation. Crop germplasm samples originally collected from the *in situ* sites and maintained at the Gene Bank were also restored at their respective sites. Indigenous knowledge of the farmers on their crop cultivars such as methods of selection, cultivation and use of different crops and cultivars, women's knowledge and role, seed exchange and movement were surveyed and documented.

- **Characterization and evaluation**

Characterization and preliminary evaluation on basic morpho-agronomic characteristics have been undertaken on about 70% of the crop germplasm accessions since the establishment of the Institute. Additional evaluations on characters such as tolerance to drought and soil salinity, reaction to certain important diseases, and nutritional value have been undertaken on some crop germplasm accessions. Various studies such as storage behavior and cytogenetic studies have been undertaken on indigenous field crop

species. Diversity studies have also been made on various field crop species based on agro-morphological traits and molecular techniques.

- **Utilization**

During the last decade there has been an increasing interest by the national crop improvement programs in utilizing the local germplasm. An average of 2,000 germplasm accessions of various crop species are distributed to research, academic and development institutions annually. Since the establishment of the Institute about 59,000 accessions of about 25 crop species have been distributed. The local germplasm has been utilized in the national crop improvement programs particularly in specific areas of breeding including those related to resistance and adaptation. Improved varieties of various crop species containing local genes, particularly of those species originating in the country and with high genetic diversity such as 'tef', 'noog', sorghum, durum wheat, barley, etc., have been recommended and released for various agro-ecological zones of the country.

The world has also benefited from the rich crop genetic diversity found in Ethiopian farmers' varieties. Among numerous examples are the yellow dwarf virus resistance gene found in Ethiopian barley, sorghum germplasm that has cold tolerance, high lysine content, good grain quality, drought and disease resistance, durum wheat germplasm for its high protein, high lysine and other basic amino acid content, and tef germplasm for gluten-free character.

- **Protected Areas**

Ethiopia has nine national parks, eight sanctuaries, four game reserves, 18 controlled hunting areas of which two National Parks are gazetted. The protected areas are a very important form of *in-situ* conservation. The Government has decentralized their administration to regions except Awash National Park and Yangudirasa National Park. This will allow the participation of local communities.

- **Biological Resources Identification**

The National Herbarium of the Addis Ababa University is publishing the 8-volume Flora of Ethiopia and Eritrea, covering the ferns, conifers and flowering plants, both indigenous and introduced. The National Herbarium now holds over 72,000 herbarium specimen collections covering most parts of the country and nearly 80% of the flora of higher plants. The national herbarium is contributing significantly in the identification of plant species that need urgent conservation.

The Natural History Museum of the Addis Ababa University has collections of mammal skins and skulls, birds, some reptiles and amphibians, a few fish and a small number of butterflies and other arthropods. This museum is the only center Ethiopia had for identification of animal species. It is significantly contributing to the conservation of Animal species.

- **Projects**

National Biodiversity Strategy and Action Plan (BSAP) Project (ongoing).

The BSAP project has undertaken, among others, stocktaking and inventory of information in the areas of legal, institutional and biotechnology/biosafety issues; ecosystem; remote sensing and geographical

information system; various flora and fauna resources; biodiversity information system, socio-economics and indigenous knowledge. All the information gathered has been compiled, synthesized and produced in a standard written form. These documents also provided the necessary ingredients for root cause analysis of problems and losses of biodiversity and option analysis prepared by national and international consultants, respectively. The root cause and option analysis are major prelude to prepare the draft national Biodiversity Strategy and Action Plan document.

Conservation and Sustainable Use of Medicinal Plants of Ethiopia – GEF is the co-funding agency for the five-year project with the World Bank, particularly *in situ* conservation of medicinal plants in and around Bale National Park (Ongoing).

Conservation and Sustainable Use of Biodiversity in the Rift Valley Lakes is under way to develop and implement a strategy and action plan in order to enhance biodiversity development, conservation and sustainable utilization. It has two major components: strengthening the system of conservation areas; and combining the goals of biodiversity development, conservation and production, and promoting the multiple uses of biodiversity.

Invasive Alien Species

From the results of the preliminary survey made in Ethiopia, Kenya, Tanzania, and Uganda, 38 different invasive species have been reported. These species consist of 21 plants, 5 vertebrates, 9 insects, 1 invertebrate and 2 microorganisms. Ethiopia has experienced the impacts of Invasive Alien Species and in some cases there exists management means for their control. However, there is too little knowledge, and the efforts for monitoring and control are severely limited. However, currently there is GEF funded project on "Removing Barriers on Invasive Alien Plant Management" hosted in Ethiopian Agricultural Research Organization.

Indigenous/traditional knowledge

Ethiopia together with the then Organization of African Unity (OAU) has developed a model law for regulating access to biological resources and for enforcing the protection of the rights of local communities to their knowledge, technologies innovations and practices, and their biological resources in line with Article 8j. This model law was adopted by the OAU summit that took place in Ouagadougou in June 1998 and it is now in the process of being domesticated by OAU member countries. Ethiopia's national law based on it is being finalized prior to submission to the Parliament.

Ethiopia has drafted a law to regulate access to genetic resources and its associated community knowledge, innovations, practices and technologies, and to protect the rights of local communities. The objective of this draft proclamation is to ensure that the genetic resources of the country are conserved, developed and sustainably used; the community knowledge, innovations, practices and technologies of local communities on the conservation and use of genetic resources are respected; and the benefits derived from the use of genetic resources, and community knowledge, innovations, practices and technologies are fairly and equitably shared by the state and local communities.

5.1.2. United Nations Convention to Combat Desertification

Over the past several years, Ethiopia has made significant strides to implement the Convention on Combating Desertification and the achievements obtained from implementing the Convention are described hereunder.

- **National Action Program (NAP) to Combat Desertification**

This program was formulated to implement the UNCCD. The NAP priority areas are: promoting peoples participation in sustainable development and natural resource management, improving knowledge on drought and desertification, formulating action program area for managing natural resources leading to sustainable development, improving the socio-economic environment, providing basic infrastructure that promote sustainable development, promotion of alternative livelihood, intensification of agriculture, promotion of awareness, organization and capacity building and Empowerment of women. The program is a national implementing mechanism of the UNCCD. It, therefore, identifies the causes for climate change and biodiversity loss and ways of coping with their effects.

Besides preparing the three volumes of NAP, the following main activities have also been undertaken.

- **Public Awareness**

The following actions have been undertaken to promote public awareness on the objectives of the convention and the NAP process in general.

- Simplified information material on the process of the implementation of the convention were prepared and distributed.
- Awareness programs including mass media targeted for representatives of various stakeholders at national, regional and community levels were carried out.

- **Enhancing NGO/CBO involvement in the NAP Process**

The Ethiopian NGOs/CBOs Network on Desertification was formally established on December 1, 2001.

- **Establishment of National Desertification Fund (NDF)**

A draft document to establish the fund has been prepared and reviewed by a national workshop.

- **Formulation of Regional Action Programs (RAPs)**

Four regions (Afar, Southern Nations and Nationalities, Amhara and Tigray) have been selected for the first phase to start with. Of the four regions, Amhara, Tigray and Afar have already finalized the formulation of their RAPs. These regions are in the process of having their RAPs endorsed by their respective State Councils.

- **Development of Gender Mainstreaming - Strategy for the NAP**

A strategy document to mainstream gender in the NAP has been prepared.

- **Road Map**

A road map for the implementation of the NAP has been prepared.

5.1.3. Status of the Implementation of the UNFCCC in Ethiopia

NMSA has established Climate Change and Air Pollution Studies Team in 1994 under the Meteorological Research Studies Department to implement UNFCCC in Ethiopia. There is also a Steering Committee and Technical Working group.

The following major activities have been undertaken to implement the UNFCCC in Ethiopia.

- **US-Ethiopia Climate Change Country Study Project**

One of the outcomes of the Rio Conference to Ethiopia was the opportunity to conduct a Climate Change Country Study Project under a US Government financial and technical assistance. The Project covered the period from June 1993 to August 1995. Activities undertaken and outputs of that Project are:

- **Institutional Support & Capacity Building**

Technical documents, hands-on training on some of the analytical tools and back stopping services were provided by the funding agency – US Country Studies Program. Hardware and equipment were also acquired through the project.

- **Greenhouse Gases (GHGs) Inventory: Phase I**

Sectors included in the GHGs inventory exercise were: Energy, agriculture, land use change and forestry, waste management, and industrial processes (cement factories only).

- **Vulnerability, Impact, Adaptation and Mitigation Assessments: Phase II**

During Phase II of the Project vulnerability, impact, adaptation and mitigation assessments were conducted on the following sectors: Agriculture (crops – wheat + grassland/livestock), forestry and water resources (Awash Basin). Mitigation assessments to climate change were carried out for the grassland/livestock and energy sectors. The outputs of the project are GHGs inventory report; sectoral reports on vulnerability, impact, adaptation and mitigation assessments were produced. Though not in published form, the final report of the Project was handed over to the Government of Ethiopia and the funding agency.

- **GEF-Ethiopia Climate Change Enabling Activity Project**

The first project on climate change in Ethiopia that was supported by the US Government gave momentum for continued activities in the sphere of climate change. So as a party to the UNFCCC and at the request of the Government of Ethiopia in February 1997, the Global Environment Facility (GEF) approved a financial support of USD 218,000 to be channeled through the UNDP, for the participation of Ethiopia in the Climate Change Enabling Activities Program. The same funding institution - the GEF, still in progress with a top-up of funds of about 100,000 USD allocates the second phase of this project. Activities undertaken and outputs of the Project are:

- **Greenhouse Gases (GHGs) Inventory and Mitigation Assessment** This activity has been built upon the previous activities done under the US-Ethiopia Climatic Change Project. National inventory of GHGs for the years 1990-1995 was carried out covering seven gases; namely: Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Non-Methane Volatile Organic Compounds (NMVOC), and Sulfur Dioxide (SO₂). Sectors covered include: Energy, Agriculture, Land-Use Change and Forestry (LUCF) and

Waste. GHG Mitigation options have also been identified in these four sectors. The Technical Working Group on Greenhouse Gas Inventory and Mitigation accomplished both inventory of GHGs and mitigation assessments.

- **Vulnerability, Impact and Adaptation Assessments**

Vulnerability and Adaptation studies and assessments focused on six socio-economic sectors; namely: Crops - Sorghum, Grassland/Rangelands & Livestock – Pastoral areas of Ethiopia, Water Resources (Abay or Blue Nile Basin), Forestry, Wildlife, and Human Health (Malaria) have been undertaken

- **Developing Framework National Climate Change Action Plan**

A draft Framework National Climate Change Action Plan (FNCCAP) has been prepared. The action plan is a framework type and it needs further improvement before implementation.

Major Outcomes of the National Climate Change Projects

- The Initial National Communication of Ethiopia to the UNFCCC was published in June 2001 and was submitted to the COP through the Convention Secretariat on the 16th of October 2001. Copies of the document have been distributed to various stakeholders.
- Draft Framework National Climate Change Action Plan has been prepared.
- National Greenhouse Gases Inventory data for the years 1990-1995 have been organized.
- Six technical reports on Vulnerability and Stage I Adaptation Assessments have been produced.
- Four technical reports on Mitigation studies; namely: Energy, Land use Change & Forestry, Agriculture, and Waste have been produced.
- Public awareness activities about climate change have been intensified.
- National Report to WSSD
- Short-term trainings

Currently there are two ongoing projects in NMSA related to Climate Change. These are:

- Climate Change Enabling Activities Phase II
- National Adaptation Plan of Action

5.1.4. The Convention on International Trade in Endangered Species in wild fauna and flora (CITES)

Ethiopia has ratified the Convention on International Trade in Endangered Species in wild fauna and flora (CITES) and it is receiving financial support for its implementation UNESCO. Ethiopia has also ratified the Protection of World Cultural and Natural Heritage Convention. Ministry of Agriculture and Rural Development, Department of Wildlife Conservation and Control is a member of the World Conservation Union (IUCN).

The Ministry of Agriculture and Rural Development has finalized a draft policy **endangered wildlife and wildlife products transport and trade** with the aim of

- protecting Ethiopia's wildlife resources, develop properly, manage and utilizing sustainably for the economic development of the country

- maintaining the government obligations under international treaties and other agreements concerning the protection, conservation or utilization of wildlife resources and habitats.

5.2. Status of Chemicals Related Environmental Agreements

National activities that complement the implementation of the obligations under each convention are summarized as follows.

5.2.1. The Stockholm Convention

- **Preparation of the National Implementation Plan (NIP)** has been started and the major activities accomplished include
 - Designation of National Project Director (NPD)
 - Identification of coordinating mechanism to get input from different stakeholders
 - Preliminary inventory on POPs
 - The EPA is currently planning to conduct workshop, set priority, set national objectives and formulate action plan.

No specific action has been taken regarding other obligations of the Convention.

- **Legal instruments and policy measures**

The following are policy and regulatory instruments that may contribute in the process of implementation of the Stockholm Convention (<http://ecb.jrc.it/natprof/ethiopia/ethiopia.htm>.)

- Provisional Standard for Industrial Pollution Control in Ethiopia prepared under the Ecologically Sustainable Industrial Development Project (ESID), 2003
- Ambient environmental standards for Ethiopia, prepared under the Ecologically Sustainable Industrial Development Project (ESID), 2003
- Environmental Pollution Control Proclamation No. 300/2002 contains provisions on the Control of Pollution, Management of Hazardous Waste, preparation of Environmental Standards
- Environmental Impact Assessment Proclamation No.299/2002
- The Environmental Policy of Ethiopia [EPE], which was approved on April 1997, has a number of provisions devoted to the management of hazardous materials including toxic chemicals
- Environmental Protection Authority Establishment Proclamation No. 9/1995 with the aim to ensure that development activities are carried out in a manner that protects the welfare of humans and sustainably protect, develop, and utilize the resource base; and manage hazardous chemicals, chemical pollutants and wastes (Article 6)
- The Constitution of the Federal Democratic Republic of Ethiopia Proclamation 1/1995 (articles 44 & 92) states that the design and implementation of programs and projects of development shall not damage or destroy the environment
- Pesticide Registration and Control Council of State Special Decree No. 20/1990 by Ministry of Agriculture with the aim to minimize the adverse effects of pesticides on human beings, animals, plants and the environment;
- A draft regulation on POPs is prepared by FEPA

- **Other relevant projects and reports that have been implemented**

- Preparation of Chemical Management Profile for Ethiopia
- The FAO Project on the Removal and Destruction of Obsolete Pesticides
- A report on Survey of the State of Environment of Ethiopia, 2002
- The EPA has established a new laboratory for environmental analysis, but the infrastructure is not sufficient for the generation of relevant data on POPs in Ethiopia
- The EPA has established the pollution control department, but the department is in the process of strengthening its capacity to undertake in depth inventory of POPs and to assess their potential impact

The responsibilities and relevant activities of ministries, agencies and other governmental institutions, and industries

- ***Government organizations***

- Ministry of Agriculture and Rural Development on matters pertinent to the import and use of pesticides
- Municipalities on matters related to unintentional release of Dioxins and Furans
- Ministry of Mines and Energy on environmental degradation related to mining operations and applications of energy sources
- Ethiopian Electric Power Authority on matters applicable to PC'B's and Chromium Copper Arsenic (CCA) as a wood preservative
- Academic institutions to undertake research on chemical pollution and pollution control
- Ethiopian and Science and Technology Commission, ESTC, houses and supports the activities of the Ethiopian Cleaner Production Center
- Ethiopian Cleaner Production Center (ECPC) delivers services to industries related to cleaner production and facilitates the establishment of ISO 14001-based environmental management systems (EMS)

- ***Private organizations***

- Those who may play a role in use, manufacturing, and trade of POPs and alternative chemicals

- ***International Organizations to provide guidance and assistance***

- UNEP is supporting the current capacity need assessment project;
- UNIDO is assisting the POPs inventory project, and other projects related to promotion of cleaner production technologies and the establishment of (EMS) for Ethiopian industrial agricultural enterprises
- Cooperzione Italiana financially supports cleaner production programs under ECPC
- FAO has been involved in the disposal of stockpiles of obsolete pesticides in Ethiopia
- WHO is assisting in identifying an alternative to DDT for malaria control in Ethiopia.

- ***Active involvement of different NGOs and civic societies***

- Awareness creation, community based waste management schemes, waste minimization through composting by an NGO called ENDA
- Environmental awareness raising, enhancing community participation and environmental advocacy by Lem Ethiopia
- Exemplary clean up of Addis Ababa and beautification by Gashe Abera Molla project
- Solid waste management activities by Plan Ethiopia

- Various initiatives on the clean up, pollution control, and rehabilitation of the major polluted streams in Addis Ababa,
- Limited involvement of private sectors in waste collection and disposal

All these efforts are constrained by lack integrated waste management and pollution control legislation; and the absence of reliable baseline information on environmental quality data, industrial information, and import/export information on hazardous chemicals and wastes.

Enforcement mechanisms

- **Monitoring and evaluation**

- The capacity for monitoring and evaluation is very limited

- **Technical guidelines preparation**

The EPA in collaboration with UNIDO and Royal Dutch Government prepared guidelines on

- Pollution Release and Transfer Registry (PRTR);
- Strategic Environmental Assessment;
- Integrated Pollution Prevention and Control (IPPC)

Sectoral EIA guidelines have also been formulated to assist in the identification of major environmental concerns including toxic chemicals in sectoral development planning and implementation.

- **Education, Training and Awareness-Raising**

- Activities on awareness creation to the responsible ministries, agencies and other governmental institutions, as well as private industries and the public at large about POPs are very limited, but training and education on environmental issues including chemical pollution is gaining attention in the higher learning institutions

Overall the efforts made and the existing capacity to implement the obligations of the Convention on POPs is not adequate.

5.2.2. The Basel and Bamako Conventions

In June 2000, the Ministry of Agriculture assisted by FAO started a two-year project to remove and destroy obsolete (and expired?) pesticides that had accumulated over the past forty or more years. The first phase of the project started with training of local staff in safety procedures for handling these hazardous materials, and a more detailed inventory. The inventory found over two thousand tones of obsolete pesticides scattered in more than nine hundred sites throughout the country. Except this, no explicit action has been taken to implement the obligations of the Basel convention and the Bamako Conventions.

- **Legal instruments and policy measures**

The management of wastes is considered to some extent in the Environmental Policy of Ethiopia, the Environmental Impact Assessment and the Pollution Control Proclamation as indicated in the preceding sections.

Additional existing regulatory mechanisms relevant to the control on the import, production, storage, transport, distribution, use, handling, and disposal of chemicals with hazardous nature and hazardous wastes are described as follows:

- Pesticide Registration and Control Council of State Special Decree No. 20/1990
- Mining Operations Regulation No. 182/1994 by Ministry of Mines and Energy to regulate chemicals employed in mining and the mining operations (Article 29 sub-articles 1 & 2)
- The Re-establishment and Modernization of Customs Authority Proclamation No. 60/1997 to control the import and export of prohibited or restricted goods including chemicals (Part 2 articles 1 & 2)
- Road transport regulation proclamation no. 14/1992 by the Ministry of Transport to prevent or mitigate vehicular pollution (Article 21)
- Radiation Protection Proclamation No. 79/1993 by the National Radiation Protection Authority to regulate, control, and supervise radiological and all activities relating to acquisition, use, transportation and disposal of radioactive substances (Articles 3, 7, and 13–15)
- Public Health Proclamation 200/2000
- Pharmacy Regulation No. 288/1964 by the Ministry of Health to control production, import, sale and disposal of drugs and psychotropic substances (Articles 34 & 39ff)
- Convention on the Elicit Trafficking & Abuse of Narcotic and Psychotropic Substances by the Ministry of Health to control illicit trafficking and abuse of narcotic and psychotropic substances
- The Ministry of Water Resources in 2003, prescribed guidelines for the quality of drinking water including health related chemicals
- Labour Proclamation No. 42/1993 by the Ministry of Labour and Social Affairs to handle and use hazardous substances safely including chemicals (Articles 92 & 93)
- Investment Proclamation No. 37/1996 by the Ethiopian Investment Authority, to protect the environment from Chemical pollutants and wastes (Article 14/1)

However, not all categories of chemicals (e.g. industrial and consumer product chemicals) are covered and even when found covered, the coverage may not span all stages of the chemical life cycle. There exist no national laws governing the manufacture/import, use, handling, transport, storage and disposal of consumer, industrial or otherwise hazardous chemicals in Ethiopia.

- **Non-regulatory mechanisms**

- The Ethiopian Cleaner Production Center (ECPC) under the Ethiopian Science and Technology Commission promotes environmental sustainability through cleaner industrial production system the establishment of environmental management system, EMS, in collaboration with the United Nations Industrial Development Organization and other partners
- As a result of such efforts, five industries have obtained the ISO 14001 certificate
- The Quality and Standard Authority of Ethiopia has been conducting a number awareness programs meant to promote the diffusion of ISO 14000 series of EMS

All these efforts are constrained by the absence of reliable baseline information on environmental quality data, industrial information, and import/export information on hazardous chemicals and wastes.

- **Enforcement mechanisms**

- The capacity for monitoring and evaluation is very limited

- The EPA in collaboration with UNIDO and Royal Dutch Government prepared guideline on
 - Industrial Environmental Fund
 - Industrial Waste Handling And Landfill Planning and Management
 - Strategic Environmental Assessment
 - Integrated Pollution Prevention and Control (IPPC)
 - Technology Selection and Transfer
 - Green Rating Initiative
- Sustainable Industrial Zone/Estate Development
- **Education, Training and Awareness-Raising**
 - Activities on awareness creation to the responsible ministries, agencies and other governmental institutions, and industries as well as the public at large about hazardous wastes is very limited, but training and education on environmental issues including chemical pollution is gaining attention by higher learning institutions.

Although efforts have been made to address the issues of POPs through various policy and regulatory instruments, the actual enforcement is not systematized. Overall the capacity to implement the obligations of the Basel and Bamako Conventions is not adequate. The country needs to elaborate a mechanism and establish facilities for the life-cycle management of hazardous wastes, emphasizing the minimization or avoidance of the build up of these wastes.

5.2.3. The Rotterdam Convention

The activities that have been undertaken to implement the Stockholm Convention enhances the implementation of the Rotterdam Convention in Ethiopia as there are obviously chemicals commonly listed in both the conventions. Prevention and Disposal of Obsolete Chemicals Phase I for the implementation of the Stockholm Convention is completed under international cooperation assistance. Phase II is underway is focuses on preventive measures. This is good example of synergy between these two environmental conventions.

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- **Enforcement mechanism:** The policy documents of the EPA relevant to the Rotterdam Convention are the Environmental Policy of Ethiopia and the Proclamation for the Establishment of Environmental Protection Organs (295/2002). The latter proclaims the re-establishment of EPA and defines its responsibilities. One of its functions is, in consultation with competent agencies, to formulate, or initiate and coordinate the formulation of policies, strategies, laws, and programs to implement international environmental agreements.
- **Available capacity to implement obligation and rights**
 - The designated national Authority is EPA
 - Officially designated officer is the Head of the Plant Protection Department and a Department within the Ministry of Public Health
 - Trained manpower. There has not been any particular training offered through bilateral agreement with a member country or the Convention Secretariat.
 - Laboratory facilities; the laboratory within the premise of the Plant Protection Department is understaffed. It has a serious deficiency in technical staff (both professional and technicians).

Some equipment need spare parts and maintenance. It is a long way from accreditation a cause for lack of recognition in the international market.

- Offices: Plant Protection Department and a Department within the Ministry of Public Health
- Information exchange with the Convention Secretariat: Ethiopia has not declared any list of banned or severely restricted chemicals. DDT is controlled used for the control of malaria. There has been an active communication between Plant Protection Department and Rotterdam Convention Secretariat.
- **Enforcement mechanism:** The policy documents of the EPA relevant to the Rotterdam Convention are the Environmental Policy of Ethiopia and the Proclamation for the Establishment of Environmental Protection Organs (295/2002). The latter proclaims the re-establishment of EPA and defines its responsibilities. One of its functions is
- **Institutional Support and Capacity Building:**
 - Environmental Information Center (EIC) -As reflected in section 4.3 of this report, the EPA has established Environmental Information Center (EIC). However, the center has not yet established its own database to avail environmental information on the chemicals listed under the Rotterdam Convention and the other chemical-related Conventions. This results in inadequate information exchange between the Convention national focal point and the Convention Secretariat. This would also create a gap in the process of achieving an integrated chemical information sources for the chemicals-related Conventions. This is therefore a challenge to the Convention focal points to synergistically implement related Conventions and may impair the desired the level of communication and interaction with focal points of other related Conventions.
 - Analytical laboratories -There is one laboratory for pesticide formulation and residue analysis within the Crop Protection Department of the Ministry of Agriculture and Rural Development. The laboratory lacks trained staff to initiate coordinated work in the laboratory. Some of the laboratory equipment lack spares parts. This a common problem of analytical capacity in developing countries
 - Technical documents -periodic updates are received by the EPA that inform of regulatory actions taken by other countries to ban or severely restrict a pesticide, pesticide formulation or industrial chemical.

5.2.4. The Vienna Convention

The Measures taken since the ratification of the Vienna Convention includes the following:

- **National Action Plan Preparation**
 - Country Program
- **Policy Document:**
 - Draft Regulations “Restriction of the Consumption of Substances that Deplete the Ozone Layer”, Council of Ministers:
 - Country program for the implementation Montreal Protocol was approved in October 1996 at the 20th meeting of the Executive Committee of the Multilateral fund;
 - Customs Amendment No 3, December 1997
- **Reports**
 - None

- **Projects:**

National Data Survey; Tax incentives for ODS-free refrigeration /duty for ODS-based; Chemicals listed in Harmonized System Classification for monitoring consumption and customs statistics; Refrigerant management plan; Recovery and recycling systems through the Multilateral Fund (Article 10 of the Montreal Protocol); Public awareness: exhibitions, seminars/training/workshops for stakeholders, mass media awareness programs

- **Available capacity to implement obligation and rights** (Compliance status –OK)
 - Officially designated officer: Mr. Demlew Demeke Deputy General Manager, NMSA
 - Trained manpower: Meteorologists
 - Laboratory facilities: None
 - Name of Office: National Ozone Office, Jan 1995-current after the creation of a National Ozone Committee in September 1995.
 - Information exchange/communication with Convention Secretariat: Receives Ozone news from Secretariat; the National Ozone Office supplies national statistical data to the Secretariat with respect to compliance
- **Training, Conference Workshop participation:** Four technicians from stakeholders trained abroad to train local trainers; Public awareness activities on protection of, and substances that deplete the ozone layer
- **Enforcement mechanism:** copies of legal instruments, environmental guidelines, standards
 - Draft regulations “Restriction of the Consumption of Substances that Deplete the Ozone Layer”;
 - Country Program

5.2.5. CURRENT SITUATION OF WASTE AND CHEMICAL MANAGEMENT IN ETHIOPIA

Although efforts are being made by the Government institutions and other stakeholders to manage waste, the actual implementation requires considerable attention. The following issues are crucial to implement sound management waste in Ethiopia as emphasized by the Basel Convention:

- Management of General Municipal waste (Sewage, solid waste) is inadequate. Proper segregation, collection, and disposal systems are not in place in most of the major cities and towns
- There is no sanitary landfill system and there is no incinerator in Ethiopia
- Management of Industrial Waste is of serious concern due to the use of outdated manufacturing technologies and lack of the awareness and concern of the potential risks of hazardous waste.
- Safe disposal of Pharmaceutical and Medical Waste is not practiced
- Accumulation of Obsolete agro-chemicals, which is related to lack of strict control on import and absence of best agricultural practices in the country.
- Industrial sectors such as Tanneries, Breweries, Textiles, Food Industries and Manufactures of Soaps and Detergents are increasing in number. Such industries generate effluents and solid wastes without any proper treatment that may cause impact on the environment Environmental impacts are unknown as very little monitoring occurs.
- Several industries and vehicle workshops use considerable amount of lubrication oil which end up as waste oil without any treatment and storage facilities
- There are numerous older transformers in use that contain PCBs and require proper disposal

- Considerable amount of wet and dry cell batteries containing hazardous materials (Pb, Zn, Hg, Cd) are being used. There is no system for collection, recycling and disposal of battery wastes.
- Industries that produce water-based and oil based paints are increasing, but they do not have any waste treatment and disposal systems
- Packaging containers such as plastics, metals, wood, papers are simply discarded as waste without any consideration of their environmental impact
- Small-scale printing is drastically increased recently due to the lower cost of printers in the country. Printer Cartridges of different types are discarded without any consideration of their environmental impact
- Huge amount of paper wastes are generated from Government offices, non-government offices, and private enterprises. Paper recycling system is not well established in the country.
- Variety of plastic products are imported and produced in the country that is ended up as waste. At present, there is no plastic recycling system in the country.
- Large-scale metal industries are increasing and small-scale metal work industries are increasing even at much higher rate.
- Hazardous chemicals from different laboratories are either directly discarded to the environment or stored without any consideration of their environmental and health impacts
- Ethiopia appears to follow the Basel Convention's requirements for the import-export of hazardous waste and the volume of imports and exports and transboundary movements of hazardous waste materials may not be a major problem. There are certain restrictions on the importation and export of hazardous waste in accordance with the requirements of the Basel Convention, but the current restrictions are generally more relaxed.
- There is no adequate facility for the handling and disposal of hazardous waste and therefore, disposal of hazardous waste mixed with solid wastes (co-disposal) at open municipal landfill sites, are generally uncontrolled and in poor condition.
- Municipal waste collection and transportation (which may include hazardous waste mixed with municipal waste) is undertaken by both private and municipal services. Hazardous waste transport legislation is not developed in the country.
- Safe storage of hazardous wastes and other wastes is obviously limited. There are also problems associated with the importation of pharmaceutical or agro-chemical products, which have in some cases in the past become obsolete at the port of entry. The suitability of storage facilities at the point of entry and at intermediate points, and at the point of use is not controlled.

The general prohibiting factor concerning recycling of waste is the uneconomically scale of operations due to the relatively small amounts generated and the long distances and corresponding high costs of transport. Reuse and recycling of hazardous wastes are increasingly being researched and undertaken by the larger multinational companies as a means of reducing the cost of waste disposal. The country reports detail that waste oil and lead-acid batteries form the bulk of hazardous wastes currently being recycled.

Cleaner production technologies are mostly only applied by larger companies, either as result of their multinational status or under the guidance of Ethiopian Cleaner Production Center. This center has been established (and is in most cases still supported) by international donor funds. The Center initially focuses seminars, training and demonstration projects to create awareness, but also provide technical consultancy services and undertake capacity building activities. Some larger industries are planning to include cleaner production technologies as an integral part of any development project. Cleaner technologies are increasingly being considered for existing projects to reduce the cost of waste handling and disposal, as well to minimise the risk of pollution and associated negative consequences.

6. CAPACITY GAPS

The existing capacity gaps in the environmental protection development and safeguarding of national interests should be perceived to emanate from the following:

- **The absorptive capacity of the individuals and institutions involved.** It is necessary for individuals to comprehend the technical content and meaning of the obligations under the various conventions, which are by no means simple, in order for the institutions to be able to implement the provisions, which bind the signatories. The first order of business in this regard is to assess the extent of technical knowledge and competence that is missing or the gap that prevails at the level of individual professional and technical staff. Institutionally, a critical mass of absorptive capacity can only be created if the concerned institutions can create the environment for [technically qualified] individuals to fully participate in the implementation of the provisions of the conventions, as well as the government's own environmental policies, strategies and programs.
- **Management skills.** The existence or absence of such skills, which more often than not stand apart from the technical competence of individuals, determine the capacity of the concerned institutions to organize and coordinate intra- and inter-institutional activities for the successful implementation of convention based national undertakings. The ability of the institutions' leadership to build up the critical mass referred to above is an important aspect of the management skills required. Such skills can be made to reside at different levels of the management hierarchy with the support of an appropriately designed information management system.
- **Institutionalised flow of knowledge and information.** This relates to the flows both within and between concerned organizations. The personal appropriation of such knowledge and information will pose a serious risk to the continuity of any institution's capacity to deal with problems by uninformed and excluded technical staff.

As it may have been obvious, the above are interrelated and are probably as crucial, if not more, as the physical and financial resources at the disposal of institutions – in the environment area, the latter two appear relatively less constraining.

The Environmental Policy of Ethiopia stipulates as its major goal the improvement and enhancement of the health and quality of life of all Ethiopians and the promotion of sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. EPA is a focal institution for the implementation of environmental conventions that the country is party to. The Environmental Organs Establishment Proclamation stipulates the mandatory need for the establishment of environmental units and agencies by all stakeholder institutions in order to enable them to coordinate environmental activities eliminate duplication of efforts and enhance the dissemination of environmental information. A number of policies, strategies and guidelines have also been formulated in order to implement the obligations and rights established in the conventions. The consulting team has recognized the following gaps that have a direct bearing on the proper implementation of the conventions. The critical gaps have been reflected in low level utilization of available funds from GEF and other financial sources, limited capacity of the country to utilize earmarked international support, and delayed project implementation and poor performance. Based on the discussions made with EPA and other stakeholder institutions and the reviews of the institutions' activity performances related with environment, the consulting team identified the following gaps.

6.1. Institutional Gaps

Availability of capable and well functioning institutions in order to properly comprehend the obligations and rights, to formulate appropriate action plans and strategies, and to implement the action plans, are vital for sustainable development. The major gaps related to this, among others, are:

- Even though the Environmental Organs Establishment Proclamation stipulates the mandatory need for the establishment of environmental units and agencies by all stakeholder institutions in order enable institutions the coordination of environmental activities, elimination of duplication of efforts and enhancement of disseminating environmental information, there are no such units in many stakeholder institutions. The conventions are not yet fully mainstreamed into the National Development Programs/Projects. This in turn has affected the process of fulfilling the country's obligations.
- There are diverse institutions responsible for the implementation of various components of the implementation plan of the conventions. They often suffer from frequent restructuring, which has resulted in low project performance.. This poses challenges by displacing personnel, loss of momentum in the process of implementation, as well as loss of documentation, and leads to difficulties in sustaining the implementation effort.
- Various projects and programs so far implemented in connection with the conventions are often implemented by ad hoc Steering Committees and Multidisciplinary Working Groups. Most members were working on a part time basis and have also been overstretched by their own routine duties. Besides, there has been lack of incentives for the working members of the project.
- As there are no established legal and functioning coordination mechanisms, the influence of EPA on the implementing institutions is not as strong as it should be. There are no well functioning forward and backward-linkages in implementing the commitments set out in the conventions and in promoting synergies between the conventions.
- Individuals responsible for coordinating projects and convention often lack the necessary knowledge base regarding the objectives and activities of the programs associated with the conventions. Issues pertinent to each convention have been addressed in a fragmented and narrowly focused manner.
- Environmental issues pertaining to the management of POPs, ozone depleting chemicals and hazardous wastes and other wastes included in the MEAs, are not well addressed in Ethiopia. Virtually no data are available regarding the generation, storage, transport and disposal of hazardous wastes. Facilities for the disposal or destruction of hazardous wastes — sanitary landfills, incinerators, biological or chemical treatment plants (neutralization, precipitation/separation or chemical detoxification) are not adequate.

6.2. Gaps related to Development and Implementation of Proactive Environmental Management Tools

There is inadequate capacity for the formulation and implementation of environmentally sustainable development management tools such as policies, strategies, laws, standards, guidelines, systems for effective impact evaluation , and the undertaking of environmental audit, monitoring and enforcement measures. As a result no environmental management tools have been developed to guide the proper implementation of the obligations under the conventions.

6.3. Poor Environmental Information and Networking

Information exchange between the convention focal points and the implementing agencies is not adequate. Most institutions don't know what the focal/implementing institutions are doing in relation to the

implementation of the conventions. There is also lack of proper mechanism for exchange of information. There is also a challenge of lack of awareness about the relevance and objectives the convention as well as lack of knowledge of the actions the conventions entail at different levels.

The Environmental Policy of Ethiopia has recognized the need for sufficient and credible environmental information for effective environmental protection and management. To expedite the process of establishment of the environmental information system of the country, EPA has established the Environmental Information Center (EIC) as one of its functional units. However, the center has not yet established its own database to avail environmental information.

There is presently inadequate capacity in terms of the following for the proper implementation of the obligations of the conventions.

- Standardized approach or system for the generation of environmental data and information;
- A properly established database;
- Linkages and networks with focal institutions;
- Operation of the system, including ensuring an easy access to Internet based environmental information service.

6.4. Inadequate Laboratory Infrastructure for Environmental Monitoring

There is one environmental analysis laboratory under EPA and another laboratory for pesticide formulation and residue analysis within the Crop Protection Department of within the Ministry of Agriculture and Rural Development. These laboratories are not accredited reference laboratories. Therefore, there is no reference laboratory for environmental analysis and validation. The analysis results lack comprehensiveness and the validity of the results is questionable. There is no uniform standard method for each parameter in order to ascertain compliance with national and international regulations of hazardous substances in the environment. The laboratory lacks trained staff to initiate coordinated work in the laboratory and for field monitoring. Some of the laboratory equipment lack spares parts. This is a common problem of analytical capacity in developing countries.

6.5. Promotion of Environmental Education and Awareness

The overall capacity for the promotion and awareness creation of environmental concerns is weak (has not been adequately developed). The essential capacity to raise and promote environmental awareness at all levels through the enhanced and effective use of mass media is still in its infancy.

More specifically, the following are still lacking:

- Strategies to promote awareness and to integrate environmental concerns through a multi-disciplinary approach into the on-going curricula development of schools and colleges;
- Properly designed programs for implementing environmental education and awareness at various levels using different media;
- Development and conducting of coordinated environmental training programs; and
- Mechanisms to monitor the impacts of the above, as well as aspects of environmental governance and stewardship.

6.6. Adoption/Adaptation of Environmental Technologies and Best Practices

There is inadequate focus on identifying and making available capacity for demand-driven, sound, cost-effective as well as socially and culturally acceptable technologies and best practices. As a consequence little or nothing has been done to identify and promote environmental technologies (BATNEC) in the following critical areas:

- i. *Enhancement of agricultural productivity through best agricultural practices*
- ii. *Waste minimization or avoidance*
- iii. *Resource saving (energy, water, etc.)*
- iv. *Introduction of cleaner and green technologies.*

6.7. Mobilization and Channeling of Technical and Financial Resources

Resource mobilization and channelling of technical and financial resources to the community level remains a big challenge. Financing of environmental interventions and disseminating the best available technologies for the rehabilitation of degraded environment at community levels is below expectation. In more specific terms, the following have been identified as being in an unsatisfactory situation:

- Strategy for technical and financial resources mobilization and capitalization, such as designation of “Goodwill Environmental Ambassadors, Chef de file”
- Linkages with other funds,
- Resource channelling mechanisms, including the design of eligibility criteria and operational policy,
- System for environmental fund administration and monitoring.

6.8. Gaps related Community Empowerment in Environmental Management and Sustainable Livelihood

Community empowerment to participate in the sustained improvement of the productivity of the individual in pursuit of a livelihood in line with the implementation of the rural development and food security programs has been far from adequate and has provided much less support in fulfilling the national obligations under the respective environmental conventions.

In summary, the overriding objective and specific activities related to the needs of efficient and sustainable management of environment is highlighted in the various policy and legislative documents described. The major policy frameworks on which other strategies and legal frameworks have been based and that have an overall bearing on environment and development are fairly good as policy documents. However, there are several problems in the implementation process. Among the most important and well-noted capacity constraints in the implementations of the various sectors are, among others, the most important are the following:

- i. **Technical problems:** There are problems related to choices of appropriate technology, problems related to the identification of best option in technical and technological standards, which have a strong impact on the sustainability of the respective projects.
- ii. **Implementation Capacity:** The capacity to study, design and implement projects in the different areas of development is still low. The capacity on social and policy related issues are also very

limited. This situation has forced Ethiopia to develop and implement a capacity building program in all sectors..

- iii. Financial Limitations:* The financial capacity of Ethiopia to finance research and development projects in the areas of sustainable livelihoods and other uses is extremely limited at the moment. This situation has forced Ethiopia to depend on foreign funds, in the form of grants/loans from all external support Agencies (both bilateral and multilateral, NGOs and others);
- iv. Integration and Coordination:* various institutions are undertaking different types of works in patchy form. Most of them are not full-fledged and not well focused to bring sustainable development. There is also lack of coordination and communication.

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FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

ENVIRONMENTAL PROTECTION AUTHORITY

National Capacity Needs Self-Assessment Action Plan

Part II: Capacity Needs Assessment

(Final Report)

**ADDIS ANTENEH
CONSULTANT/ECONOMIST
April 2006, Addis Ababa**

TABLE OF CONTENTS

1. INTRODUCTION AND BACKGROUND	1
1.1. INTRODUCTION	1
1.2. BACKGROUND	1
2. FRAMEWORK FOR CAPACITY NEEDS ASSESSMENT	3
2.1. NECESSARY CONDITIONS.....	3
2.2. UNDERLYING PRINCIPLES AND PROCESSES.....	3
3. THEMATIC AREAS AND APPROACHES FOR CAPACITY NEEDS ASSESSMENT	5
3.1. THEMATIC AREAS.....	5
3.2. OVERALL APPROACH TO CAPACITY NEEDS ASSESSMENT	5
4. CAPACITY NEEDS ASSESSMENT BY THEMATIC AREAS.....	1
4.1. MAINSTREAMING AND INSTITUTIONALISING ENVIRONMENTAL ISSUES	1
4.2. COMMUNITY MANAGED ENVIRONMENTAL MANAGEMENT FOR IMPROVED LIVELIHOODS	4
4.3. REHABILITATION OF MAJOR ECOSYSTEMS	7
4.4. ENHANCING THE CAPACITY OF THE ENVIRONMENT TO DELIVER GOODS AND SERVICES.	9
4.5. MANAGING ADVERSE IMPACTS OF MUNICIPAL WASTE.....	13
4.6. PREVENTION OF ENVIRONMENTAL POLLUTION	16
5. PRIORITIZATION OF CAPACITY BUILDING NEEDS	21
5.1. CAPACITY BUILDING FOR MAINSTREAMING AND INSTITUTIONALISING ENVIRONMENTAL ISSUES	21
5.2 CAPACITY BUILDING FOR COMMUNITY-LED ENVIRONMENTAL PROTECTION FOR IMPROVED LIVELIHOOD	25
5.3. REHABILITATION OF MAJOR ECOSYSTEMS	33
5.4 ENHANCING THE ENVIRONMENT.....	45
5.5 ACTION PLAN MANAGEMENT OF ADVERSE IMPACTS OF MUNICIPAL WASTE.....	64
5.6 ACTION PLAN FOR PREVENTION OF ENVIRONMENTAL POLLUTION.....	105

1. INTRODUCTION AND BACKGROUND

1.1. Introduction

This consultancy service was undertaken on the basis of a contract agreement signed between the Environmental Protection Authority (EPA) and Addis Anteneh Consultant/Economist (AEC) on December 16, 2005¹. The EPA had earlier commissioned AEC (April 2005) to produce a stocktaking report, a capacity needs assessment report, and a capacity building action plan. AEC produced the three generic documents, which were discussed at a workshop organized to review and assess the findings, conclusions and recommendations. The client and all the other stakeholders from both the Federal and Regional institutions attending the workshop accepted the reports.

In addition to the work of the local consulting team, which has produced Stocktaking, Capacity Needs Assessment and Action Plan documents in a generic form, EPA Task Forces and Regional Agencies have been also trying to develop their own region-specific documents. These documents required further review and consolidation as well as integration into the National Capacity Needs Self-Assessment Action Plan.

The assignment is expected to produce three sets of consolidated documents consisting of a stocktaking report, a capacity needs assessment report, and a capacity building action plan. The Stocktaking Report, which has already been submitted to the Client as Part I, reviewed the existing situation in Ethiopia regarding the nature of the obligations specified in the international environmental conventions, protocols and other agreements (hereinafter to be collectively referred to as the conventions) entered into by the country. The status of the implementations and the enforcement of the conventions, including the existing capacity at national level, as well as the policies and strategies in existence and in operation necessary to meet these undertakings are also reviewed in Part I. This report (Part II) presents the capacity needs assessment of the various federal level stakeholders (EPA, NMSA, IBC, different government sectoral ministries and other public institutions, as well as private sector and non-government organizations) involved in the implementation of the obligations and rights included in the various conventions. The capacity building action plan will be presented in Part III.

1.2. Background

The Stocktaking Report and the lessons drawn from other countries have revealed that the conventions contain several obligations and require actions that are commonly applicable in the framework of the protection and management of the environment. These include, for example, obligations for research, reporting, training, public education, awareness and national exchange of information. While it is recognized that each convention stands on its own, with specific objectives and commitments, there is also an inherent relationship and mutual dependency amongst all of them. In this regard, there would be considerable importance and value in taking a holistic approach to national strategy development and capacity building. Understanding the synergies among these conventions, and finding ways to co-ordinate and harmonize overlapping activities among them is thus being increasingly recognized as a way of ensuring effective national measures at the country level.

Even though Ethiopia has serious capacity limitations and constraints, it is in the process of taking the necessary actions to meet its obligations and exercise its rights specified under the respective environmental conventions since the ratification and adoption of the conventions. Considerable efforts

¹ AEC's team consists of: Dr. Belay Simane, Team Leader and Agronomist and Environment Resource Management Expert, Professor Zerihun Woldu, Ecologist/Environmental Management Expert Dr. Feleke Zewge, Environmental Chemist, and Ato Addis Anteneh, Economist and Advisor to the Team.

are being made and activities are being considered by the Ethiopian Environmental Authority (EPA) to facilitate strategic planning and reporting mechanisms and to strengthen the capacities of Federal and Regional institutions so as to meet the respective obligations and to take advantage of the provisions of the international conventions that Ethiopia is a party to.²

While the implementation of environmental obligations and rights rests on many federal and regional institutions, EPA is the focal point and the coordinating body for the international conventions regarding the environment and bio-diversity. The overall progress made so far includes the establishment and strengthening of relevant institutions, enactment of laws concerning biological and environmental matters (including the introduction of some environmental quality standards), and a number of environment-related policies, strategies and action plans prepared by different stakeholders.

Over the recent past, there has also been a growing perception and commitment towards an improved natural resources management and environmental protection regime in the country. It is on the strength of this perception and commitment that Ethiopia has embarked on the constitutional, policy and legislative measures described in the Stocktaking Report (chapters 3 and 4) in order to address the environmental problems and bring about sustainable development. The EPA, as the focal government institution, carries the responsibility to coordinate the implementation of the conventions. To this effect it has formulated a national vision for an environmentally sustainable development and has set out to assist the concerned institutions in realizing their perceived objectives and goals.³ In principle, this vision should also provide the basis for the institutions to align their goals and objectives accordingly and plan to develop their capacity in order to meet the obligations emanating from the conventions.

The Stocktaking Report was concluded by indicating the need for capacity building at all levels in order to effectively implement and enforce the national obligations and to benefit from the provisions stipulated in each of the environmental conventions and the protocols related to or emanating from them. The report identified and discussed the common capacity gaps in relation to the following aspects (chapter 6):

- Institutional arrangements;
- Development and implementation of proactive environmental management tools;
- Development and implementation of environmental information and networking;
- Laboratory infrastructure;
- Environmental education and awareness;
- Adoption/adaptation of environmental technologies and best practices;
- Mobilization and channeling of technical and financial resources; and
- Community empowerment in environmental management and sustainable livelihood.

The main objective of EPA is to ensure that all matters pertaining to the country's social and economic development activities are carried out in a manner that will protect the welfare of human beings as well as to protect, develop and utilize the resource base on which the livelihood of the people depends. The Stocktaking Report has clearly established that there are serious capacity gaps pending immediate consideration by the relevant stakeholders to be able to meet the overall and specific objectives to be discussed later in this report. The following sections of the report will first present the framework within which the capacity needs assessment was carried out followed by the capacity needs assessments.

² The international conventions have been discussed in detail in the Stocktaking Report already submitted by the Consultant. The report included up-dates on the current status of these conventions, their broad aims, procedures, as well as the national obligations undertaken and the rights conferred under the conventions.

³ To reiterate, the national vision is stated as follows: "To achieve productive environment, self-reliance, improved qualities of life, equity within and between generations of Ethiopia through environmentally sustainable development and stewardship". The elements that have a bearing on the ecological, economic and social aspects of environmental protection and management are further elaborated as part of the vision. EPA's own vision is the achievement of a sustainable future for humanity in which all people have the opportunity to live in healthy and productive conditions and in harmony with nature.

2. FRAMEWORK FOR CAPACITY NEEDS ASSESSMENT

2.1. Necessary Conditions

The key elements for creating the necessary capacity to effectively implement the obligations and rights under the environmental conventions described and to develop practical strategies and actions for sustainable development include the following:

- **Create an enabling environment**: Create appropriate institutional arrangement and provide the respective institutions and the local communities with the required opportunities to express the potential (including their leadership potential) and to build self-reliant livelihoods. The recognition of the sovereign rights of the people to directly participate in the identification of their priorities and the planning and implementation of the strategies and actions is an integral part of the enabling environment.
- **Empower local communities**: As the most directly affected segment of the population by environmental mismanagement and abuse, the empowerment of the local community is a central component of an effective strategy that would enable the country to achieve improvements in all environmental matters that could affect their livelihoods.
- **Promote shared responsibility**: Since the protection and management of the environment has become both an international and a national issue, fostering environmentally sustainable development should be the responsibility of all the stakeholder institutions.
- **Link individual, institutional and systemic capacity needs**: Individual technical knowledge, skills, attitudes and behavior make up the ingredients of overall institutional performance and capabilities, which in turn constitute important elements for the ability of individuals and institutions to deal with the external (regulatory, competing and complementary) environments.

2.2. Underlying Principles and Processes

The consulting team proposes that the key principles and processes described below be considered in the national effort to undertake a self-assessment of country capacity needs, and to subsequently build the requisite capacity to implement or enforce the obligations and provisions outlined in the international environmental conventions (GEF, 2001).⁴ It is believed that integrating these principles into the NCSA process (and beyond) will help to ensure sustainability and the active participation of the stakeholders. Such an approach is also expected to improve coordination, efficiency and accountability and to optimize solutions.

1. ***Ensuring National Ownership, Leadership and Policy Commitment***: The NCSA process and related capacity building activities should be nationally owned, led and need driven. This would involve national (and/or regional) experts playing a major role in the NCSA process. In addition, a high degree of national political commitment and leadership – which should be sustained beyond the NCSA process – is considered essential. The regions would decide on their priorities and detailed courses of action, while local communities and administrations would be offered the opportunity to monitor, evaluate and assess their own activities so that they could learn-by-doing. *Such ownership, leadership and commitment (properly expressed and applied at national, regional, local, and community levels) would constitute an important part of capacity.*
2. ***Utilizing Existing Coordinating Mechanisms and Structures***: Efforts should be made to take advantage of existing capacity -- government structures, NGOs, CBOs and other institutions that

⁴ These principles have been adopted by the GEF and recommended to guide such capacity needs assessments. The consulting team fully endorses this approach, particularly for a strategy that would promote grass roots involvement in environmental protection and management.

have a stake in environmental protection and management -- in planning and implementing the proposed strategies and projects designed to implement or enforce the obligations and the provisions of the conventions. This will help avoid unnecessary overlap and duplication of effort, as well as ensure continuity in determining coordinated priorities and follow-up action in an integrated manner. *This will also avoid misallocation of resources where a non-integrated approach may result in the creation of redundant institutions that will not necessarily enhance existing capacity.*

3. ***Promoting Comprehensive Participation:*** The detailed formulation processes of strategies and projects in relation to environment and sustainable development should ensure involvement of all affected and interested parties (including the wide range of relevant governmental ministries and agencies). In particular, local communities and the private sector have increasing responsibility to foster environmentally sustainable development. An important aspect is the inclusion of stakeholders at the early and formative stages, especially when decisions (targets) are to be made on how the NCSA will be implemented. Involving stakeholders at an early stage would result in the identification of issues which might have otherwise been overlooked or not considered as important, but which could prove to be of significant importance for certain stakeholders or for the matter in question. *Genuine participation would create greater critical mass to effectively deal with the complex issues of environmental protection and management.*
4. ***Adopting a Holistic Approach to Capacity Building:*** This involves recognizing and addressing the various dimensions or levels of capacity, which include the individual, the institutional and the systemic (e.g. the overall policy framework in which individuals and organizations operate and interact with the external environment and the formal and informal relationships between institutions). An inadequate emphasis to address problems at the systemic level may, for example, diminish the impact of efforts at the institutional and individual levels. A proper balance, therefore, needs to be established between all three (closely interlinked) levels of capacity building. A holistic approach also means ensuring co-ordination and complementarities across sectors. *Effective capacity building requires a holistic approach.*
5. ***Adopting a Long-term Approach to Capacity Building within the Broader Sustainable Development Context:*** The NCSA should be seen as a starting point – or a contribution – to a long-term process, which strengthens the thematic programs and projects proposed. Environmental protection and management for sustainable development requires long-term commitment and action. Projects such as NCSA are the building blocks for the long-term development of a sustainable and self-driving program. *Capacity needs must be seen in this long-term perspective in order to be able to promote individual, institutional and systemic commitment to deal with the problems of environmental protection and management on a sustained basis.*

3. THEMATIC AREAS AND APPROACHES FOR CAPACITY NEEDS ASSESSMENT

3.1. Thematic Areas

The capacity needs assessment exercise is primarily concerned with the assessment of the capacity of the stakeholders to implement or enforce the obligations of the international environmental conventions. Environmental sustainability can be achieved only through sustainable development by improving the rural livelihood. Achieving this objective will involve long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, particularly at the local level. (Article 2, UNCCD). In this connection, a number of thematic areas have been identified in consultation with EPA to provide an additional framework for the implementation of these environmental provisions. These thematic areas, however, go beyond the mere implementation of specific provisions, but ensure that environmental management and sustainable development efforts are need driven and long lasting. These thematic areas are the basis for conducting the proposed capacity needs assessment.

The principal thematic areas identified include the following:

1. Mainstreaming and institutionalization of environmental issues and improved access to appropriate information and technical knowledge.
2. Community managed environmental protection for improved livelihoods
3. Rehabilitation of adversely affected ecosystems
4. Capacity enhancement of ecosystems to deliver goods and services
5. Management of adverse impacts of municipal waste
6. Prevention of environmental pollution

The background and justification for each of the above will be presented and discussed in the context of the capacity needs assessment of the NCSA project stakeholders.

3.2. Overall Approach to Capacity Needs Assessment

Figure 1 presents an overview of the approach for capacity needs assessment. The scheme does not only present the proposed content of the assessment at each level but also shows the relationship among the three levels of capacities required to achieve the purposes of the NCSA.

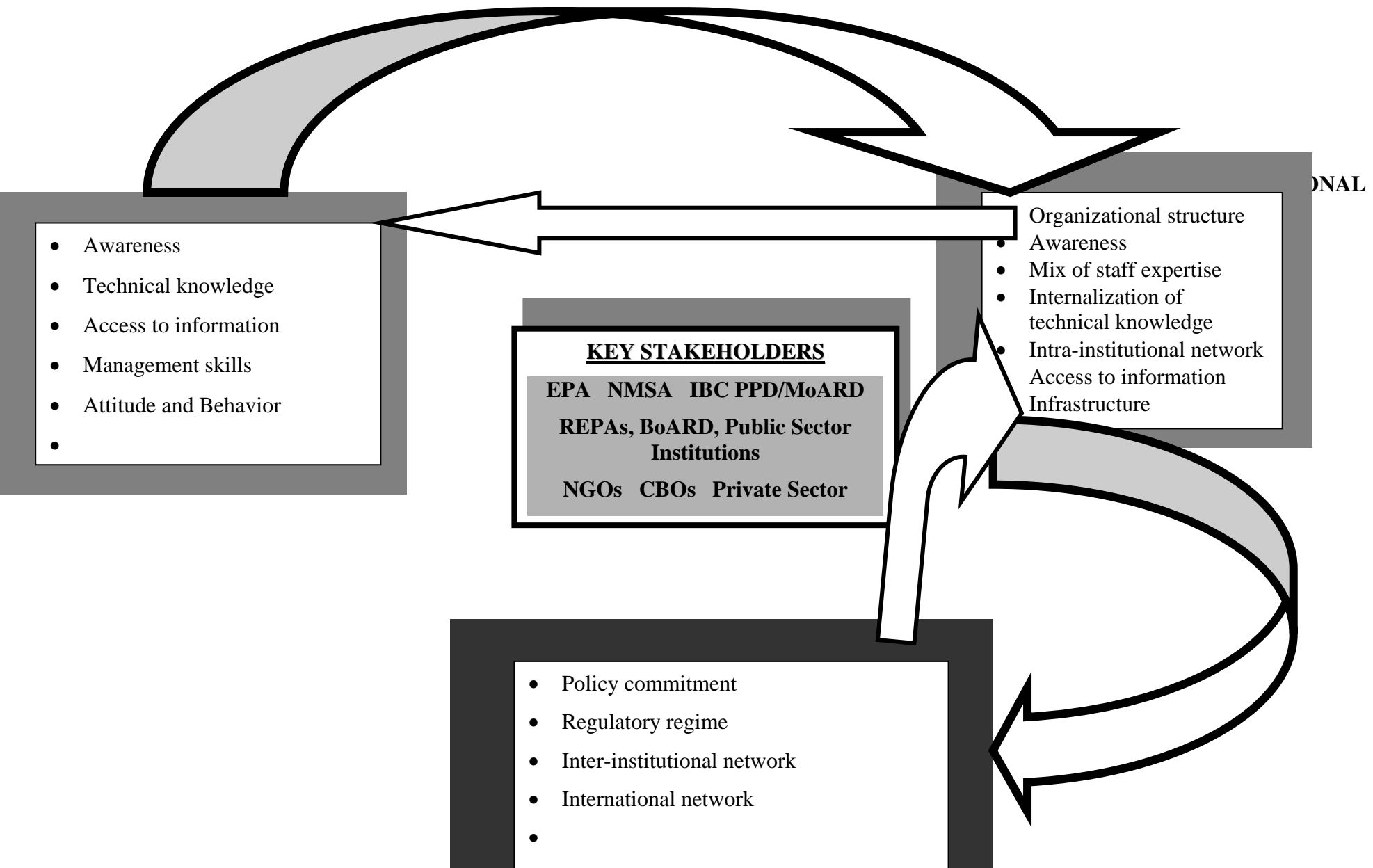
Accordingly, the figure also shows what needs to be addressed in the process of the capacity needs assessment, and the relationships between the individual, institutional and systemic levels. For instance, if EPA considers that its present contingent of staff is technically qualified but lacks management skills, then action plans to respond specifically to the needs of EPA will be developed. On the other hand, EPA may need additional expertise to accomplish what it intends to accomplish. In addressing the action plan for capacity building, one would need to find out and determine if this could be met through short-term consultancies or external technical assistance or the employment of additional staff, or a combination of these as the case may require.

The figure, furthermore, indicates the relationships between the different levels of capacity building. Individual capacities have a significant influence on the institutional level, e.g. in terms of creating collective awareness of problems and issues; their attitude and behavior towards their tasks influencing internalization of technical knowledge at institutional level. The institutional level capacities will obviously have a major influence on the individual management skills, staff attitudes, technical knowledge, etc. Institutional level capacities influence systemic level capacities, for example in terms of

the collective technical knowledge in EPA or IBC making it possible for the larger system to develop appropriate homegrown policies to which there is adequate commitment. Institutional capacities will determine the extent to which the different organizations will create a viable inter-institutional network on environmental issues, and develop a coordinated network with international systems and ad continuum.

The following sections will present the capacity needs assessment under each of the thematic areas listed under section 3.1 above and in relation to the type of capacity requirements identified (i.e., human resources, infrastructure, and institutional arrangements) for the main stakeholders.

Figure 1: CAPACITY NEEDS ASSESSMENT SCHEME



4. CAPACITY NEEDS ASSESSMENT BY THEMATIC AREAS

4.1. Mainstreaming and Institutionalising Environmental Issues

a) Organizational strengthening

Environmental problems have become pervasive and are now recognized as cross cutting issues that impact a wide range of economic, social and even political activities. As a result of this and the provisions contained in the international environmental conventions, the Ethiopian Government has gone so far as to legislate the mandatory need for the establishment of environmental units and agencies by all stakeholder public institutions (Environmental Organs Establishment Proclamation, 2002). The objective of the legislation was to enable the coordination of environmental activities, the elimination of duplication of effort and the enhancement of the dissemination of environmental information through networking. In relation to the latter, the flow of appropriate information among the concerned institutions through such environmental units will increase the stakeholders' capacity to keep current on environmental issues affecting their specific spheres of activity (mainstreaming), as well as the country's related policies, programs and activities. The critical mass created by the network of professionals staffing these units (as different from the technical knowledge of individuals operating separately in each organization) will mean a new dimension in the collective capacity of the institutions involved.

On the other hand, because of the non-existence of the environmental units, there is so far no functioning coordination mechanism through which the EPA can effectively influence the public sector development institutions. Partly as a consequence of this, the EPA is presently operating without any meaningful formal or sustained link with these institutions or the other stakeholders (rural communities, private sector, NGOs, CBOs). Since the latter also have a closer working relationship with the sector institutions that implement or enforce government programs and projects – e.g. MoARD, MoWR, MoTI or MoME – the absence of EPA's link has resulted in its inability to influence effectively the mainstreaming of environmental concerns.

At the time of preparing this report, none of the public sector development organizations that are considered to have primary and direct environmental concerns, particularly arising from the obligations contained in the international conventions, have established the environmental units. In the light of this, the following capacity needs have been identified in this regard:

1. Concerted efforts by EPA to realize the proper establishment of the environmental units so as to facilitate a formal and active link with the other stakeholders in the national environment protection and management program;
2. Adequately staffed and equipped Environmental Units in MoARD, MoTI, MoWR, MoME and other relevant stakeholders;
3. Staff of Environmental Units working full time on environmental matters;
4. Stable (i.e. not *ad hoc*) steering committees or working groups set up for the purpose of inter-institutional coordination and assistance to the units.

b) Improved access to information

Access to information is a critical component of the capacity for improved environmental protection and management and the promotion of an environmentally sustainable development program. The Environmental Policy of Ethiopia has recognized the need for sufficient and credible environmental information for effective environmental protection and management. EPA established the Environmental Information Center (EIC) in 2001 as one of its units under the Deputy Director General (Environmental Protection Agency, A

Brief Overview, 2001). The Center was created to establish an environmental information system, referral services and data bases, as well as to ensure information exchange. However, the center has yet to establish its own database (including that which would serve the several international conventions), let alone being in a position to provide environmental information to other stakeholders and users.

In 2004, an attempt was made to establish an Ethiopian Environmental Information Network (Ethio-EIN) as part of the African Environmental Information Network (AEIN), an initiative supported by UNEP in response to the request by the African Ministerial Conference on the Environment (AMCEN)⁵. Most of the core strategic issues indicated in the Strategic Plan pointed to the lack of capacity in both the focal institution and other stakeholder public organizations (weakness or absence of an information unit, limited access to information, shortage/high turnover of skilled manpower, lack of capacity building, lack of ICT capacity, lack of analytical capacity, etc.). The EIN initiative has apparently failed to materialize due to inaction or lack of commitment by the policy makers, and probably due to a proposal that was considered over-ambitious. The institutional weaknesses and threats pointed out in the document have probably got worse while the strengths may not be valid any more and some of the opportunities present at the time could have been missed altogether (see pp. 16-17 of the Strategic Plan).

Partly due to the absence of an operational EIC (and the failure of the EIN initiative), information exchange both within and among EPA, the convention focal points and the implementing agencies is not adequate. This is again in part attributable to lack of a proper mechanism for the exchange of information. A more serious reason for the situation is the lack of awareness about the relevance and objectives of the environmental conventions Ethiopia is a party to, as well as the lack of knowledge of the actions the conventions entail at different levels.

The inadequate capacity prevailing in the institutional set up in this respect stems from the following:

- The absence of a standardized approach or system for the generation, compilation and management of environmental data and information;
- The lack of a properly established database;
- The poor linkage and networking of the focal stakeholder institutions;
- The deficient technical knowledge, across the stakeholder institutions, for the proper operation of the system, including ensuring easy access to Internet based environmental information.
- Insufficient infrastructure (computer equipment, appropriate software) necessary to properly establish the information system including networking.

In the light of the discussion above, it is believed that there is need:

1. to increase and upgrade the human resources necessary to properly build up and manage the environmental information system (at the EIC as a first priority and the other stakeholder institutions subsequently);
2. to develop in a more systematic manner the information based linkages with the primary stakeholder institutions;
3. to provide adequate infrastructure for the optimal operation and management of the environmental information system.

⁵ EPA, "Strategic Implementation Plan for Ethiopian Environmental Information Network (Ethio-EIN)", Final Draft, August 2004, Addis Ababa.

c) Improved laboratory capacity

This is related to the acquisition of technical knowledge of individuals and institutions in order to be able to obtain scientific knowledge and carry out appropriate analyses on the basis of which the implementation or enforcement of the convention obligations could be carried out.

There is one environmental analysis laboratory under EPA and another laboratory for pesticide formulation and residue analysis within the Crop Protection Department of the Ministry of Agriculture and Rural Development. These laboratories are not accredited reference laboratories. Therefore, there is no reference laboratory for environmental analysis and validation. The analysis results lack comprehensiveness and the validity of the results is questionable. There is no uniform standard method for each parameter in order to ascertain compliance with national and international regulations of hazardous substances in the environment. The laboratory lacks trained staff to initiate coordinated work in the laboratory and for field monitoring. Some of the laboratory equipment lack spares parts. This is a common problem of analytical capacity in developing countries.

In view of the above shortcomings, there is a need to develop capacities in the following areas:

- technical support to accredit the two laboratories;
- lack of equipment and spare parts and lack of skill for maintenance ;
- adoption and validation of test standards, or R/D for in-house test methods
- reliable availability of reagents;
- practical training for the laboratory personnel

d) Community empowerment and environmental education

Past experience both in the country and outside proved that community-based environmental management and conservation are more successful linking with the development of local communities. Empowering the communities and providing the necessary environmental education and resources will enhance the management of environment. This approach requires resources and supportive legal framework. However, community empowerment to participate in the sustained improvement of the productivity of the individual in pursuit of a livelihood in line with the implementation of the rural development and food security programs has been far from adequate and has provided much less support in fulfilling the national obligations under the respective environmental conventions.

The institutions responsible for the implementation of various components of the implementation plan of the conventions are different. They often suffer from restructuring. This poses challenges on the capacity and experience of individuals to properly perceive the obligations and provisions of environmental conventions to the new personnel. The overall capacity for the promotion and awareness creation of environmental concerns is weak (has not been adequately developed). The essential capacity to raise and promote environmental awareness at all levels through the enhanced and effective use of mass media is also at its infancy. Due to the shortage of capacities at both individual and institutional levels, development and conducting of coordinated environmental training programs is weak and not coordinated.

e) Development and implementation of proactive environmental management tools

The Ethiopian Government has increasingly recognized the importance of environmental protection and conservation measures during the past decades. It is now generally accepted that economic development strategies must be compatible with environmental goals. This requires the incorporation of environmental dimensions into the process of development. It is important to make choices and decisions that will eventually promote sound development by understanding the environment functions.

In spite of the recognition given to the proactive environmental tools for all economic development programs to be compatible with environmental goals, much of the development activities including the land currently under agriculture are deteriorating due to inappropriate planning, implementation and management. Natural resources, particularly soil and water, are being seriously affected. Adoption of environmental impact assessments (EIAs) will enable the country's natural resource in an integrated manner, avoiding irreversible environmental damage.

The problems discussed above are due to the inadequate capacity of the following:

1. lack of trained manpower to effectively implement EIA in all sectors;
2. absence of appropriate guidelines or adoption/adaptation of existing ones from elsewhere (strategic risk assessment, cost benefit analysis, health impact assessment, etc. guidelines)
3. poor functional linkages and institutional arrangements for monitoring and evaluation ;
4. absence of enforcement mechanisms; and
5. low level of public and private awareness and absence of modalities for public and private sector involvement

In the light of the problems described above, there is need to:

1. increase and upgrade the human resources necessary to properly undertake proactive environmental management and monitoring;
2. develop appropriate guidelines and tools to different sectors and projects;
3. to provide adequate infrastructure for the optimal operation and management of the environmental impact assessment

In the light of the problems described above, the stocktaking report and the discussions made with the management and experts of different stakeholder institutions, the capacity needs identified to Mainstream and Institutionalize Environmental Issues to enhance the implementation of environmental obligations and to establish well functioning institutional arrangement are the following:

1. Educate and Train policy makers and experts of line ministries about the Environmental conventions
2. Mainstream environmental issues in all line ministries
3. Train Laboratory and Field monitoring experts.
4. Reinforce and Equip environmental laboratories
5. Improve Environmental Information Exchange system
6. Ensure proactively the integration of environmental issues in all development activities

4.2. Community Managed Environmental Management for Improved Livelihoods

In spite of the high natural resource potential in the country, there is a high incidence of continued food insecurity and extreme poverty. The reasons for the ongoing food and economic crises in Ethiopia are multifaceted: severe and recurrent drought, infrastructure deficiencies, weak input and output markets, population pressure, and degradation of land resources due to nutrient mining and soil erosion because of poor husbandry practices. This is generally applicable to both the crop and livestock sub-sectors, which have contributed, in varying degrees to the degradation of the natural resources through diverse means including deforestation and overgrazing. These problems have forced the country to become heavily reliant on massive food aid to avert catastrophic loss of human life due to starvation. Poverty alleviation remains a huge challenge and the reversal of the environmental degradation process a daunting task.

Much of the land currently under agriculture is deteriorating due to inappropriate planning, implementation and management. Natural resources, particularly soil and water, are being seriously and adversely affected. Soil erosion, desertification, salinization and water logging reduce productivity and jeopardize long-term sustainability. Agricultural expansion and resettlement programs have often encompassed marginal land in many parts of the country and often without prior environmental impact assessment. Wise management of the environment requires an ability to forecast, monitor, measure and analyze environmental trends and assess the capabilities of land and water at different levels, ranging from a small farm plot to catchments.

Experience and literature review suggest that subsistence farmers ultimately reject changes in agricultural practices with environmental benefits but economic losses. Farmers will only accept changes in agricultural practices promising immediate and significant increase and stabilization of yields. Environmental conservation technologies must therefore meet two conditions: ecological and economic effectiveness. In this regard the introduction of high yielding agricultural technologies (crop, animal) will be imperative for sustainable land management at farm level. Contrary to common perceptions, this would lead to higher economic benefits and sustainable resource use.

Ethiopia's experience in *in situ* maintenance of crop genetic diversity is characterized by a decentralized system with broad-based participation of farmers and other groups, particularly the agricultural extension workers, the local administration and some NGOs. Through a novel approach of establishing Community Gene Banks (CGBs) with local communities, over 400 samples of various farmers' varieties of major food crops are being conserved as well as multiplied and distributed to smallholder farmers. There are 12 CGBs located across the country in 6 of the different agro-ecological zones. The critical issues that require capacity building in order to properly conserve and utilize the country's biodiversity resources are the following:

- in the light of the diverse agroecologies and the biodiversity resources available, there is a need additional *in situ* conservation sites and field gene banks;
- build new safety duplicate gene banks in case of any accident with the available gene bank;
- build molecular lab and green houses; and
- increase and upgrade the human resources necessary to properly undertake biodiversity conservation and utilization

Over the centuries, Ethiopian farmers have employed numerous practices to use, enhance and conserve the biological diversity of crops and trees in traditional farming systems. Such practices continue in many parts of the country today. The uses of mixed species for pest control and stability and the integration of indigenous trees in the farming systems are few of the examples from the central highlands of Ethiopia. Policulture plots (home gardens) found in some parts of the country (e.g. Kaffa and Konso) are traditional farming systems used to conserve biodiversity. Farmers have also developed complex techniques to select, store and propagate farmer produced seed varieties.

The numerous practices for enhancing biodiversity are also tied to the rich cultural diversity and local knowledge that are valuable elements for the community livelihood and biodiversity conservation. Farmers are aware of and knowledgeable about the use of diversity in cultivated plants and tree species. They reduce risk and contribute to resilience, food security and income generation under the subsistence farming systems of Ethiopia. They are also good in maintaining soil fertility and productivity.

Renewable natural resources, i.e. land, water, forests and trees as well as other forms of biodiversity, which meet the basic needs for food, water, clothing and shelter have now deteriorated beyond a critical level. In many parts of highland Ethiopia, the present consumption of wood is in excess of natural biomass production. Estimates of

deforestation, which is mainly for expansion of rainfed agriculture, vary from 80,000 to 200,000 hectares per annum⁶.

Environmental degradation in Ethiopia is proceeding at an alarming pace for the technical and socio-economic reasons cited earlier, but also probably equally, if not more importantly, for the reasons of non-conducive policy and institutional arrangements. The non-conducive institutional arrangements principally relate to the inability or the unwillingness to involve the primary stakeholders (mainly farming and pastoral communities), who are at the frontline of the catastrophic environmental degradation, to have their rightful say in environmental protection and management programs of the country.

The preceding discussion provides considerable evidence for why so many land management initiatives in Ethiopia had little positive long-term impact. In this context, it is proposed that appropriate programs and projects that incorporate bottom-up approaches leading to sustainable land management need to be designed to realize the implementation or enforcement of the international environmental conventions.

Regarding the capacity needs required to undertake these, it is first and foremost necessary that the national level stakeholders (EPA and the public sector development organizations) have the requisite willingness, knowledge and skills to:

- fully understand objectives and processes of environmental protection, conservation and management practices of the farming and pastoral communities;
- introduce more advanced, scientific environmental protection and management methods and tools that are community-friendly and capable of upgrading or complementing existing practices;
- motivate and ensure the communities' participation in the planning, implementation and monitoring of environmental programs designed to meet the obligations and other provisions of the international environmental conventions based on government policies and strategies.

Based on the above, the identifiable capacity needs at government and other public institutions level include the following:

1. adequately trained and qualified staff to plan, guide, coordinate and monitor participatory, livelihood-based and community managed environmental management and development programs and projects;
2. institutional arrangements among the stakeholder institutions to share responsibilities and to coordinate activities in community awareness creation, technical training, project planning, implementation and monitoring.

At the community and non-government levels:

1. proper awareness about government environmental policies and strategies, as well as the obligations and rights contained in the international environmental conventions (content, benefits, costs and implications for community livelihoods);
2. technical knowledge about improved environmental protection, conservation and management approaches and methods;
3. technical knowledge about improved and sustainable agricultural management that results in improved community livelihoods;
4. technical knowledge and resources to sustainably conserve and utilize biodiversity resources;

⁶ EPA, 2003. State of the Environment Report of Ethiopia, Addis Ababa.

5. technical knowledge and resources to properly manage and utilize water resources
6. proper organizational structures and arrangements to participate in policy formulation, awareness creation, training, project planning, implementation and monitoring.

4.3. Rehabilitation of Major Ecosystems

Human societies derive many essential goods from natural ecosystems, including food, game animals, fodder, fuel wood, timber, and pharmaceutical products. These goods represent important and familiar parts of the economy. What has been less appreciated until recently is that natural ecosystems also perform fundamental life-support services without which human civilizations would cease to thrive. These include the purification of air and water, detoxification and decomposition of wastes, regulation of climate, regeneration of soil fertility, and production and maintenance of biodiversity, from which key ingredients of our agricultural, pharmaceutical, and industrial enterprises are derived. This array of services is generated by a complex interplay of natural cycles operating across a wide range of space and time scales.

The rapidly increasing numbers of population and livestock in Ethiopia, where environmental resources are the base on which these economies largely depend, have taken population densities well past the land's carrying capacity at current levels of input and technology. Farmers are thus increasingly being forced to cultivate marginal and fragile areas. Thus environmental degradation has undermined the existence of natural and cultural heritages, critical biodiversity centers (hotspots), economic and socio-cultural values of ecosystems such as forests, rivers, lakes, grasslands, as well as wetlands and mountains. Soil erosion has affected more than three-quarters of cultivable land, drastically reducing its productive potential; and vegetation which is vital for the maintenance of the fragile eco-systems, is being cleared at an alarming rate. Natural heritages are being interfered with to an extent that their existence is being highly threatened. Annex A to this report describes in some detail the current state of Biodiversity Hotspots in Ethiopia and the further threats and dangers they are exposed to as a result of human activity (farming, logging, mining, infrastructure development, etc.) or neglect (e.g. lack of appropriate regulatory regimes) or lack of capacity to rehabilitate or restore, maintain and enhance the ecosystems.

The climatic variation resulting from the wide range of altitude and topography; the numerous drainage systems, the variation in edaphic factors, and paleoclimatic evidences indicate that Ethiopia was originally a heavily forested country. However, deforestation has occurred to such an extent that now only less than 3% of the country as a whole and only 9% of the area above 1500m is covered by closed broadleaved forests. This is perhaps not surprising since the highlands have been settled for more than 5,000 years and widespread deforestation started about 2,500 years ago. Now only 16 per cent of the total arable land has no serious fertility limitations and 47 per cent of this is too dry for productive rain-fed agriculture. The process of environmental degradation is often not obvious because it is usually gradual and unnoticeable. It is, therefore, a grave mistake to see areas of presently unused land as inexhaustible reserves.

While environmental problems in Ethiopia abound, a considerable natural resource and agricultural potential exists over large areas of the country. When the natural capital including land resources are used in accordance with their suitability, and are appropriately managed, environmental degradation can be prevented and increases in productivity and production achieved.

In general the rehabilitation of the ecological functions and values of the major ecosystems cut across the obligations entrusted on EPA, IBC, NMSA and MoA as focal points for the various aspects of RIO and the Convention on International Trade in Endangered Species (CITES). The stakeholders in ecosystem rehabilitation and sustainable use may include the communities directly involved in ecosystem resource

exploitation, CBOs and NGOs and their roles may include among others two-way communication, advisory roles, consultation, partnerships and joint decision-making.

A very opportune situation in Ethiopia currently is that all the necessary proclamations and policies regarding conservation of natural resources are already in place. A glaring drawback, however, is the lack of capacity to enforce these legal instruments in accordance with the environmental visions of the country reviewed in the Stocktaking Report. Although EPA is the focal point to enforce the legal instruments for conservation in their totality, there are currently no institutions with adequate capacities or clear mandates to conserve ecosystems and to monitor conservation activities with the broader objective of conserving major Hotspots. This is mainly because the concept of Hotspots is relatively new.

The activities to conserve ecosystems have not advanced beyond rehabilitation of ecosystems of only local significance. Awareness about ecological functions and economic values of key biodiversity sites, which can contribute to global biodiversity conservation, received limited attention. Ethiopia therefore needs to engage in efforts, which would simultaneously satisfy its immediate environmental objectives and global goals. The concerned agencies such as EPA, IBC, MoARD and NGOs need to build their capacities, broaden their horizons and turn their attention to biodiversity conservation with Biodiversity Hotspots in perspective. Hence EPA, IBC, MoARD and NGOs working on environmental conservation must actively engage themselves in massive training, workshops and build material and financial strength by acquiring the necessary budget from the Government and attracting bilateral and multilateral support for concerted regional and continental activities for key biodiversity sites and global hotspots. However, EPA, IBC and MoARD (Department of Wildlife Conservation) are understaffed, under-funded and those currently engaged in conservation activities lack the necessary skills and motivation. By way of fulfilling the needs of the stakeholders and focusing on Key Biodiversity sites and Hotspots, wetlands, natural and cultural heritages and other degraded ecosystems of national scale will have to receive their deserved attention and be effectively conserved. This would reinforce the fledgling eco-tourism industry, increase the negotiating power for access to and benefit sharing in natural resources at international level and curb the trade in endangered species.

Environmental impact assessment must be integrated with the activities considered part and parcel of the rehabilitation of major ecosystems, the maintenance of their essential characteristics and the sustainable enhancement of their productivity. This will avoid or at least minimize the deleterious effects of well-intended activities, which could damage the environment and defeat the purpose. Management plans must be proposed in consultation with community and the stakeholders at large to create a sense of ownership and to promote equitable access to resource use and benefit sharing. This can be adequately handled by EPA, which, however, needs to build its capacity to review environmental impact statements and give pertinent decisions to investment applications so that ecosystems can be safeguarded from irresponsible pillage.

The capacity needs for rehabilitation of major ecosystems and maintenance of their essential characteristics, services, and enhance their productivity in a sustainable manner include the following:

1. adequately trained and qualified staff to plan, coordinate and monitor the rehabilitation of major ecosystems and maintenance of their essential characteristics, services, and to enhance their productivity in a sustainable manner;
2. technical knowledge and financial resources to:
 - a. restore and wisely use wetlands for reducing poverty;
 - b. rehabilitate Biodiversity Hotspots;
 - c. restore and sustainably use natural heritage sites;

- d. protect cultural heritage sites;
- e. halt further degradation of and rehabilitate rivers in urban centers and industrial zones;
- f. halt the decline of aesthetic, socio-economic and ecological attributes and values of lakes and enhance their productive capacity;
- g. increase the percent of forest cover to fulfill demands for fuel wood, fodder, construction, industrial use, and other forest products;
- h. identify and manage protected areas;
- i. design and implement integrated watershed management programs;
- j. utilize and manage gum producing woodlands.

4.4. Enhancing the Capacity of the Environment to Deliver Goods and Services.

Ethiopia's location in tropical zone of Africa and its varied topography have given rise to the diverse rainfall and temperature patterns. The environmental problems are equally diverse. Species extinction as a result of habitat destruction is threatening many plant, animal and microbial species. Unwise exploitation of natural resources has left a lot of derelict habitats unattended and degraded. These include quarry sites, open riverbanks, street and roadsides exposed to wind and water erosion and abandoned irrigation infrastructures harboring disease vectors and their production capacity undermined. Inadvertent anthropogenic activities are encouraging the introduction, rapid dispersal and contamination of natural habitats and agricultural fields by alien or invasive species.

The plant resources occurring in these diverse climatic, edaphic and topographic variations of the country need to be conserved both as living and preserved specimens in appropriate sites and need to be effectively managed in Botanical Gardens which can serve as recreation centers and city decoration in their own right but also for various other more important uses. Establishment of Botanical Gardens can therefore serve as entry points for various reclamation and control activities so that Environments to deliver “Goods and Services” without interruption and alteration at present and in the future as long as humanity and life on earth need them.

A Botanical Garden, which is an advocate for the plant kingdom, pursues its mission through its role as a museum of living plant collections arranged in gardens. It can serve as a center of great collections of living and preserved plants both exotic and indigenous, a leading educational center for gardening and horticulture, and a center for plant research, advice and action on all aspects of plant conservation.

A Botanical Garden is committed to educating both adults and children about the beauty of nature, science and importance of plants. This will increase public knowledge and understanding of the value and vital importance of plants to increase recognition of and support for conservation. This can be achieved through

- public education
- elementary and high school education
- higher education and training

Among the Garden's educational facilities and programs as part of the public education is an indoor/outdoor science museum where children explore, experience, and discover nature hands-on where tens of thousands of schoolchildren will visit each year to tour the garden and participate in classes about plant science.

Research, which is an integral component of the activities in a Botanical Garden, could focus mainly on collections of plants, both living and preserved and scientific literature. Full use can be made of the extensive human knowledge base and expertise in taxonomy and horticulture in the country as a whole. Research, documentation and conservation will all be based on the collections in the Gardens, curated and conserved through horticultural activities and preserved collection deposited in an Associated Herbarium.

The Horticultural activities in botanical gardens are a multi-purpose activity, supplying plant materials in quantities and qualities required by users, supporting the research program and balancing this with a high-quality visitor amenity. The living collections will represent a resource for botanical science nation-wide, whether for pure scientific purposes or those with economic potential. Most important of all, the living collections and the horticultural skill that caters for them will be a resource for *ex situ* conservation of plant diversity and its integration with habitat restoration and species reintroduction. An advanced range of techniques, including storage and preservation of seeds, embryos and pollen and micro-propagation, can be used to support both *ex situ* and *in situ* conservation of a wide range of endangered and threatened plants and their habitats.

Despite the great diversity in climate, topography and flora, some of which are either threatened or endangered, Ethiopia does not have a botanical garden worthy of mentioning. There are only a few gardens serving limited purposes such as fresh supplies for extraction of active ingredients in some University Campuses and research institutions.

Establishing botanical gardens require committed organizations capable of coordinating stakeholders and an infrastructure with substantial financial input to be able to collect, represent and propagate plants in a large garden that can accommodate the diversity within and among communities, populations and ecosystems. The stakeholders of a botanical garden are the Higher Education Institutions, the Municipality and the Environmental Protection Authority. The Higher education Institutions will be responsible for guiding taxonomic and conservation activities while the municipality is responsible of providing the land, the infrastructure and the financial support. EPA is responsible for coordinating and monitoring the activities at the initial phase.

Botanical Gardens will be established in major cities in all Administrative Regions of Ethiopia in order to give emphasis to the conservation of the floral heritages of the regions in particular and those of the nation in general. The botanical Garden will be associated to herbaria that can house various types of preserved specimens such as dried plant parts, spirit collections of wild flora of the various vegetation types and plants of economic importance.

Herbarium houses a collection of dried and preserved plant specimens that document the identity plants. It represents reference collections with many and varied functions including identification, research and education. Activities of botanical gardens need to be linked with those in Herbaria since both share a common objective of conserving and preserving the botanical resources.

The land for establishment of Botanical Garden in Addis Ababa has just been received and negotiations are in progress for the rest of the activities. The Botanical Garden in Addis Ababa is a joint venture among the Municipality of Addis Ababa, the Addis Ababa Environmental Protection Authority and Addis Ababa University. The activities of the Botanical Garden will be integrated with the Regional Herbaria and National Herbarium of Addis Ababa University.

The Economic Botany Collections at the National Herbarium illustrate the extent of human use of plants around the world. The huge varieties of objects ranging from artifacts made from plants to raw materials are deposited. Uses range from food, medicine and utensils, to social activities and clothing, while the raw materials themselves range from seeds to dried leaves and pickled fruits. These Collections build an important bridge between biological and cultural diversity and are a valuable resource for the study of plant uses past, present and future. The collections in the National Herbarium are complemented with an extensive collection of photographic transparencies and slides relating to fieldwork, artifacts and other aspects of economic botany.

At the initial stage, the Botanical Gardens, which will be established in the other cities, may have to be associated with the National Herbarium of Addis Ababa University. This will create the need for the establishment of Regional and Local Herbaria thus expanding the knowledge on and the appreciation of the flora and ethno-botany of the country at large. Botanical gardens can generate revenue by way of entrance fee from visitors, sponsors and researchers when they are fully operational and can eventually become economically self sufficient.

The comprehensive knowledge on the flora of Ethiopia and the appreciation of the knowledge and the uses associated to plants will have multiple uses. One such use is the selection and propagation of appropriate plant species for planting trees in city parks, on the edges of streets of the cities, major roads and riverbanks. Additional functions of extensive botanical gardens and decoration of street and roadside and riverbank with trees is their role as carbon sink thus cleaning the air and reducing the green house effect. The trees on the edges of riverbanks and rural roads will abate the soil erosion that could develop into large gullies and finally shortening the lifespan of the roads. Long lasting roads ensure the communication network, which is vital for development.

While Botanical Gardens can have multiple purposes such being center of research, source of propagules, center for *ex-situ* conservation, City Green Areas can supplement the objective of Botanical Gardens but mainly serve decorative and recreation purposes. As such Green Areas and City Parks do not need specialized care and can be handled by private investors. Individuals can be encouraged to be involved in Garden Areas City and Park business to earn income by charging affordable price for recreation such wedding ceremonies, weekend recreations and a variety of entertainments.

The threat to biodiversity due to invasive alien species is considered second only to that of habitat destruction. Invasive species cause loss of biodiversity including species extinctions, and changes in hydrology and ecosystem function. Invasive species are a serious hindrance to conservation and sustainable use of biodiversity, with significant undesirable impacts on the goods and services provided by ecosystems.

The threat of such species as *Prosopis Juliflora*, *Parthenium hysterophorus*, and *Lantana camara* have already become a threat to the native biodiversity in the Rift valley and agricultural fields in most parts of the country. The fish populations of some Rift Valley Lakes are being displaced by *Clarias gariepinus* and [*Carassius carassius*](#), (*crussian carp*). Alien species of plants have posed the most serious threats and deserve priority consideration.

Ecology of invasion requires information on the rate and mechanism of transport and movement of organism, on characteristics allowing a species to become successful invader and also on the properties of the ecosystems that make them susceptible to the invaders. Control efforts can be designed following the acquisition of the information on the invaders and the hosting ecosystems.

The knowledge on flora which can be enhanced by establishment of botanical gardens at all strategic locations has an indispensable role in the compiling biological information, such as identity and biological properties chocking abandoned irrigation channels, which is vital for their control.

Quarry sites take land out of use, are unsightly and serve as breeding sites for diseases vectors. They can also be causes of unforeseen accidents such as drowning of unattended children, old people and livestock. The urgency of reclaiming such sites cannot therefore be emphasized.

Reclaiming and re-vegetating these sites demands a scientifically grounded, accurate response to the issues of land use. It requires a creative approach, with a vision for opportunities to create win-win situations for multiple stakeholders. The quarry that can be restored can offer marketable value through redevelopment into public parks or private developments.

The knowledge on the flora will partly help in the characterization and efficient control of invasive plant species invading agricultural lands, pastoral areas and riparian vegetation. Reclamation of degraded sites, non-operational irrigation channels and abandoned quarry sits also need knowledge on plants. The establishment of Botanical Gardens will therefore precede all other activities related to selection of appropriate plant species for planting in different sites, the reclamation activities and their control in places where they are not welcome. Environmental Impact assessment must be part of the activities considered as part and parcel of enhancing the capacity of Environments to deliver “Goods and Services” because well-intended activities might result in deleterious effects, which could damage the environment and defeat the purpose.

The potential goods and services of environments can be realized through integrating conservation and rehabilitation efforts with activities of communities in earning their daily livelihoods. Purposes and targets of conservation efforts must be communicated to the communities and incentives must be provided for participation because others will likely use resources not used by one individual when a sense of ownership is not inculcated. Although rehabilitation is a long process, much can be achieved when efforts are categorized into phases. The shortest possible period to obtain gratifying outcomes for the concerted efforts in conservation and rehabilitation would be about ten years.

The need for enhancing environments to deliver goods and services in Ethiopia arises because environments are highly degraded and community and Government focuses are on efforts with immediate economic returns with little attention to long-term ecological gains. As a result botanical gardens are few, there are no city green parks of international standard; rural roads, city streets, rivers and irrigation channels are devoid of trees bordering them. There are several unfilled quarries in cities and urban areas, desolate, abandoned state farms and water reservoirs. Recently, alien plant species are menacing the landscape and have become serious threats to biodiversity and loss of agricultural fields. The establishment of botanical gardens would enable the country to meet its obligation to conserve biodiversity while the vegetation cover along rivers, streets and roads among other biomass related benefits would help in carbon sequestration and emission trading.

The municipalities of Addis Ababa and major cities in the Regional States need technical, financial and training assistance to build botanical gardens, herbaria and green houses.

The Federal Government and the Regional States need technical assistance in selecting appropriate species and financial assistance to plant trees on edges of rivers, rural and trans-regional roads. Alien species, currently choking the indigenous flora by out-competing them for environmental resources, could be controlled using either biological or mechanical means when the biological property is documented. To control alien species MoARD and the Regional Bureau need both technical and financial assistance, while research centers at EARO and the Federal Coordinating Authority (EPA) need training in the control of alien species. The feeling of quarries in Addis Ababa and major cities in the Regions is mainly a question of aesthetic value and could be achieved through financial assistance. The fact that there are no botanical gardens or city parks in cities, not many city streets, river sides, local and trans-regional road sides covered with trees is a clear suggestion that at least there is a need for financial assistance to achieve those. Awareness creation on the long and short-term benefits of developing these resources could be considered when the prospect of obtaining the necessary financial resources is ascertained.

In the light of the above discussions, for enhancing environments to deliver goods and services⁷, there is need for capacity to be created or strengthened in terms of increased availability of appropriately trained and skilled human resources. In this respect, the concerned institutions would need to increase their capacity to plan, design and implement related projects and activities in the following areas:

1. establishing botanical gardens and/or city parks;
2. establishing urban residential green areas;
3. planting trees on the edges of urban and rural roads;
4. planting trees on the edges of rivers;
5. identifying and rehabilitating abandoned quarry sites;
6. identifying and reclaiming lands and water bodies invaded by alien invasive species;
7. identifying and reclaiming previously public owned and abandoned state farms;
8. identifying and reclaiming non-operational irrigation infrastructures; and
9. identifying and managing affected water reservoir sites.

4.5. Managing Adverse Impacts of Municipal Waste

Waste management is an integral part of environmental protection, protection of human health and welfare and sustainable economic development. Currently, most of the domestic solid waste generated in different parts of the country is disposed in open dumps, which is often considered as a significant source of pollution to the ambient air, soil and water and a significant risk for human health and public welfare. Although complete information on the status of waste management in different cities and towns is not available at the moment, a recent report by the Addis Ababa City Administration⁸ has clearly indicated the prevailing and specific situations related the problems of waste management. These are summarized as follows (Ref 1):

- The existing waste dump is open and may cause significant air pollution and risks to human health and the natural environment;
- The open waste dump thus lacks any operational concept and technical provision for protection of public health and the environment
- Typical arrangements of various containers for waste collection at public places show no observable concept for separate collection and treatment;

⁷ By way of biodiversity conservation, increasing the green cover of cities, streets and roads and preventing invasive species and reclaiming ruined sites and affected reservoirs

⁸ Solid Waste Management Status Report of Addis Ababa: The Way Forward, City Government of Addis Ababa Sanitation, Beautification and Park Development Agency, July 2003.

- The contact and spreading of wastes by insects and other animals may pose a risk to human health;
- A typical situation of overflowing waste collection containers was observed;
- Most of the municipal green wastes, which could be collected separately and used for composting, are mixed with wastes such as plastics, rubber, and metals;
- Containers for waste collection are often in poor condition and of inappropriate design and generally low technical quality;
- A large part of the technical equipment is not useable due to lack of maintenance;
- Most of the collected waste is transported by small vehicles to the central open waste dump which also attracts scavengers search for useable items;
- There is no sorting or processing of waste materials at the source or at the site of disposal;
- Improper waste collection and disposal practices have caused very extensive littering and aesthetical pollution of the natural environment, especially around the waste dump area and local collection sites;
- Hazardous wastes are also disposed of without any pre-treatment necessary for recovery and reduction of environmental hazards;
- Wastes from business centers such as restaurants are disposed of improperly;
- Production wastes are also dumped in a raw form due to lack of specific treatment and utilization of materials;
- Wastes from healthcare facilities are disposed of directly or without sufficient treatment;
- Wastes from garages are released directly into the open environment.

The Environmental Pollution Control Proclamation of Ethiopia stipulates that no waste, whether hazardous or non-hazardous municipal solid waste, may be disposed of outside any appropriate and legally authorized waste treatment facility.

a) Linkages with the Multilateral Environmental Conventions

Ethiopia is party to multilateral environmental agreements (MEAs), which require member states to facilitate the establishment/strengthening of national programs for the sound management of hazardous wastes and other wastes. Countries that are party to the MEAs have accepted specific obligation to avoid or minimize waste generation and to ensure the availability of adequate facilities for their waste management operation so as to protect human health and the environment (Basel Convention, 1989).

The types of wastes regulated under the Basel Convention and Bamako Convention under List A and List B are (Basel Convention, 1989):

- Metal and metal-bearing wastes;
- Wastes containing principally inorganic constituents, which may contain metals and organic materials;
- Wastes containing principally organic constituents, which may also contain metals and inorganic materials;
- Wastes, which may contain either inorganic or organic constituents.

The types of wastes regulated under the Stockholm Convention are:

- Nine Intentionally produced POPs that are slated for elimination (Annex A and Annex B)
- Unintentionally produced POPs (dioxins, furans, HCB, PCBs) in Annex C

- Stockpiles, wastes and products and articles upon becoming wastes that consist of, contain or are contaminated by POPs.

In accordance with the Environmental Pollution Control Proclamation No. 300/2002 (Part Two, paragraph 4) the importation, preparation, keeping, distribution, storage, transportation or use of a chemical categorized as hazardous or of restricted use, and wastes that contain hazardous chemicals shall be subject to a permit from the Environmental Protection Authority or the relevant regional environmental agency or from any other competent agency. It is evident that this proclamation is linked to all the chemicals-related conventions described in the Stocktaking Report, namely: The Basel and Bamako Conventions, the Rotterdam Convention, the Stockholm Convention as well as the Vienna Convention and the Montreal Protocol. The designated national focal point, EPA, and a competent implementation agency for each convention are required to develop implementation plans in order to accomplish the objectives and fulfill the obligations under these conventions.

To establish environmentally sound management of solid wastes and developing disposal facilities, the implementing institutions should abide by the national pollution control laws, standards and guidelines as well as by the Basel and Bamako Conventions. The environmental management systems of industrial enterprises should also comply with these Conventions, where applicable. Currently, there is no Federal legislation dealing comprehensively with all aspects of solid waste management in Ethiopia. The Public Health Proclamation No. 200/2000 has provisions on waste handling and disposal. The Environmental Policy of Ethiopia gives attention to sustainable development including a polluter pays principle, recycling and other environmental issues.

b) Waste management requirements

The principles that are agreed upon in the development of waste and hazardous waste management strategies include (SPREP Hand Book):

- The Source Reduction Principle
- The Integrated Life-cycle Principle
- The Precautionary Principle
- The Integrated Pollution Control Principle
- The Standardization Principle
- The Proximity Principle
- The Least Trans-boundary Movement Principle
- The Polluter Pays Principle
- The Principle of Public Participation

In the light of these issues, management of waste should focus on efforts for prevention of wastes, recovery of resources from wastes, and treatment and safe disposal as a last option. Waste minimization involves changing production, consumption and disposal activities so that resources can be used more efficiently, less wastes are generated, and more wastes reused and recycled. Consideration of the life cycle of products and processes would enable to minimize the impacts at any time in the life cycle of a material. This requires a national effort because many waste management issues have a national rather than a regional or local

character: for example, the movement of wastes in the Regional States, establishment of pollution standards, the development of markets for recyclable materials. As an overall strategy, waste management has to be associated with a range of techniques and/or process activities targeted at different points in the production chain. As such, it involves resource use, production techniques and product design. Waste recycling involves both in-house recycling by industry, and post-consumer recycling by households.

Realization of such efforts requires adequate legislation; information gathering and dissemination; capacity for implementation and enforcement; community involvement; effective education programs; and technology transfer. The major capacity constraints for the overall waste management programs in the country are related to:

- Lack of comprehensive waste management policy at the national level;
- Lack of community involvement in the development of waste management policy and process;
- Absence of appropriate framework for the regulation of waste management facilities and activities;
- Absence of comprehensive baseline data on the amount, type and composition of waste generated in the country, information important for disposal and for the recovery of a range of materials, including energy;
- Low adoption/adaptation of environmental technologies and best practices in relation to waste minimization or avoidance, re-use, recycling, and resource saving;
- Absence of adequate monitoring (as well as enforcement mechanisms), which would also be a necessary prerequisite for the controlled collection and, subsequently, also for successful planning of new facilities for waste treatment;
- Lack of environmentally responsible transporting, reprocessing and handling of waste;
- Absence of integrated waste planning and services on a regional basis;
- Lack of appropriate sanctions for unlawful waste disposal;
- Absence of information on the exchange of waste material;
- Limited participation of the private sector in waste management programs and activities;
- Lack of proper financing;
- Limited regional and international co-operation;
- Limited education and awareness creation.

In this study, major strategic issues were identified along with the priority actions required in order ensure sound management of wastes in Ethiopia. The categories of solid wastes that require action include residential wastes, packaging wastes, various metals, plastics, rubbers, paper, glass, medical wastes, construction and demolition debris, used oils and other hazardous substances. In general, with all waste management options, there are preferred choices and hierarchies of options. Waste avoidance/minimization is the preferred choice in all appropriate cases, including the substitution of substances by others which generate less hazardous waste. Recovery and recycling of wastes provide the next range of preferences, followed finally by those involving outright disposal.

4.6. Prevention of Environmental Pollution

The Environmental Pollution Control Proclamation (Proclamation 300/2002) prohibits the release of pollutants into the environment by any person engaged in any field of activity. Any person who causes any pollution shall be required to clean up or pay the cost of cleaning up the polluted environment. Installation of a sound technology that avoids or reduces, to the required minimum, the generation of waste and, when feasible, recycling of waste is encouraged. The proclamation further stipulates that a permit is required to generate, keep, store, transport, treat or dispose of any hazardous waste.

The EPA has already prepared the “Provisional Standard for Industrial Pollution Control” (EPA, 2003) and a regulation for the enforcement of the standards in Ethiopia. In the Provisional Standard for Industrial Pollution Control, two approaches were suggested for both the existing and new industries: cleaner production and Best Available Technologies/or Techniques (see Stocktaking Report). A “Draft Proposal of Ambient Environmental Standards” (EPA, 2004) has also been prepared.

In consultation with the competent agencies, the EPA is also authorized to formulate other environmental standards based on scientific and environmental principles. The EPA is empowered to establish additional environmental guidelines and standards for different areas as it may be necessary to protect or to rehabilitate the environment.

In accordance with the Environmental Pollution Control Proclamation No. 300/2002 (Part Two, paragraph 4) the importation, preparation, keeping, distribution storage, transportation or use of a chemical categorized as hazardous or of restricted use, shall be subject to a permit from the Authority or the relevant regional environmental agency or from any other competent agency. It is evident that this proclamation is linked to all the chemicals-related conventions described in the Stocktaking Report, namely: The Basel and Bamako Conventions, the Rotterdam Convention, the Stockholm Convention as well as the Vienna Convention and the Montreal Protocol. The designated National Focal Point, EPA, and a competent implementation agency for each convention are required to develop implementation plans in order to accomplish the objectives and fulfill the obligations under these conventions.

To establish environmentally sound management of industrial wastes and developing disposal facilities in each industrial zone, the implementing institution should abide by the national pollution control laws, standards and guidelines as well as by the Basel and Bamako Conventions. The environmental management systems of industrial enterprises should also comply with these Conventions, where applicable.

To implement the Stockholm Convention (see Stocktaking Report), the EPA has set an objective for cleaning up of all sites contaminated by persistent organic pollutants (POPs) within a defined period. The pesticides and industrial chemicals listed under the Rotterdam Convention should be kept in mind when environmental management systems are established by both the manufacturing industry and agricultural enterprises. It is to be noted that both the Stockholm and the Rotterdam Conventions have some chemicals in common, which would enhance synergy in implementing the two conventions (see Stocktaking Report).

According to the Vienna Convention, its protocols and amendments, Ethiopia, as a member state, should implement them to lead to phasing out the consumption of ozone depleting substances and equipment that apply ozone-depleting substances in accordance with the applicable convention and protocol obligations.

Various legislative measures have been adopted for environmental protection in Ethiopia. However, most of these provisions are declarative, and lack proper implementation mechanisms. At present, the EPA lacks adequate enforcement authority to ensure compliance with these environmental protection regulations.

Pollution prevention is the reduction or elimination of wastes and pollutants at their sources. For all the pollution that is avoided in the first place, there is that much less pollution to manage, treat, dispose of, or clean up. Pollution prevention can encompass activities such as:

- Redesigning products to cause less waste or pollution during manufacture, use, or disposal
- Altering production processes to minimize the use of toxic chemicals
- Implementing better housekeeping practices to minimize leaks and fugitive releases from manufacturing processes
- Taking steps to reduce energy consumption

Pollution prevention within industry generally receives the most attention. However, Pollution prevention efforts in other sectors such as agriculture, power generation, transportation, and others related to human activities are equally important.

According to the United State EPA's official definition, pollution prevention means "source reduction", but also includes "other practices that reduce or eliminate the creation of pollutants through

- Increased efficiency in the use of raw materials, energy, water, or other resources, or
- Protection of natural resources by conservation.

The source reduction can be any practice that:

- Reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and
- Reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants. Source reduction includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

Sustainable development, a term popularized in 1987 by the United Nations' World Commission on Environment and Development (the "Brundtland Commission"), is defined as meeting the needs of the present global population without impeding the ability of future generations to meet their needs. The goal is for humans to live within the carrying capacity of the earth

- Which means not depleting resources or degrading the environment through excessive waste and pollution
- So as to leave things in at least as good a condition as we found them. The notion of intergenerational equity is central: it implies an ethical obligation to protect the environment and conserve resources so as the future generations will be able to meet their material and energy needs and live healthy, productive lives.

The current trend in pollution prevention regulatory strategies encourage pollution prevention and creating incentives for human activities to surpass simple compliance and reach for optimal environmental management.

This signals two things:

- Movement from the end-of-pipe, single-media regulations of the past few decades as experienced by most developed nations to more holistic, proactive strategies that anticipate and prevent negative environmental impacts, pollution prevention Concepts and Principles and

- Shifting from the traditional command-and control model of environmental regulation as experienced by most industrialized nations toward a more incentive-based, partnership approach.

Notwithstanding these shifting priorities, however, pollution control and strong regulatory standards remain as important elements of environmental regulation. Pollution prevention is a great help in addressing multimedia concerns, since pollution that is never created cannot be shifted from one environmental medium to another (as often occurs as a result of the existing, regulatory approach that deals separately with releases to air, water, and land). Institutional reorganization, strong leadership, reevaluation of existing regulatory and permitting strategies, and development of voluntary pollution prevention programs are the major ways in which pollution prevention can be addressed.

Provision of technical assistance and information to industries, citizens, and the regional governments on pollution prevention methods and state-of-the-art technologies, conducting and providing funding for scientific research and development programs are very critical. The set up various education and outreach programs to promote pollution prevention activities are also highly supportive approaches. Development of guidelines and tools such as life cycle assessment, environmental labeling criteria, environmentally preferable procurement guidance, environmental auditing guidelines, and voluntary standards on pollution prevention such as the ISO 1400 Series and environmental management are other activities that should be carried out and/or supported by the EPA

Survey of the Self Capacity Needs Assessment documents by the Regional EPAs and Federal EPA indicated that the environmental pollution aspects that require priority action include:

- Industrial pollution
- Pollution due to agricultural activities
- Environmental degradation due to hydropower development projects
- Urban air pollution due to transportation activities
- Pollution due to the use of ODS containing equipments
- Pollution due to disposal of wastes
- Stockpiles of obsolete chemicals
- Absence of national environmental pollution monitoring programs
- Environmental awareness and education

Addressing these issues require adequate legislation; information; capacity for implementation and enforcement; community involvement; effective education programs; and technology transfer. The major capacity constraints for the overall pollution prevention and control in the country are related to:

- Lack of adequate pollution monitoring program at the national level;
- Institutional set up
- Absence of appropriate framework for the regulation of environmental pollution prevention;
- Absence of comprehensive baseline data on the amount, type and composition of pollutants generated,
- Lack of environmental technologies and best practices in relation to pollution prevention;
- Lack of environmentally responsible transporting, reprocessing and handling of waste;
- Absence of integrated pollution prevention and control;
- Lack of appropriate sanctions for unlawful waste disposal;

- Limited participation of the private sector on pollution prevention programs and activities;
- Lack of proper financing;
- Limited regional and international co-operation;
- Limited education and awareness creation.
- Limited research and development
- Competent laboratories at federal and regional levels
- Shortage of trained human resources

Priority actions and the capacity needs to address these problems are identified for 10 years at federal, regional and zonal levels.

5. PRIORITIZATION OF CAPACITY BUILDING NEEDS

5.1. Capacity Building for Mainstreaming and Institutionalising Environmental Issues

A. Objectives:

A1. Overall Objective:

The overall objective is to improve the capacities of personnel who are directly involved in the implementation of environmental obligations and to establish well functioning institutional arrangements.

A2. Specific Objectives:

1. Educate and Train policy makers and expertise of line ministries about the obligations and provisions of Environmental conventions (To increase awareness on sustainable management of the environment and natural resources and develop and use EE&T as a tool for improving the management of environmental resources).
2. Mainstream environmental issues in all line ministries
3. Institutionalize environmental issues by establishing appropriate units in order to properly implement the obligations and provisions of environmental conventions in all development activities,
4. Establish efficient Environmental Information Exchange system between the convention focal points and the implementing institutions.
5. Train Laboratory and Field monitoring technicians.
6. Equip environmental laboratories and develop standard method for each parameter in order to ascertain compliance with national and international regulations.
7. Develop environmental management tools

Table 1. Strategic Goals and Priority Activities for Mainstreaming and Institutionalizing Environmental Issues

No	Strategic goals ⁹	Priority activities ¹⁰	Remarks
1	Educate and Train policy makers and experts of line ministries about the Environmental conventions	<ul style="list-style-type: none"> • Prepare awareness creation manual for Policy makers • Provide awareness creation workshop for policy makers • Prepare training manual for technical experts • Provide specialized training for experts Arrange experience sharing tours for experts	All Biological and Chemical Related Conventions
2	Mainstream environmental issues in all line ministries	<ul style="list-style-type: none"> • Review all relevant policies and laws for their impacts on environmental sustainability and make the necessary amendments • Identify missing issues and amend the policies and strategies where applicable. • Develop a monitoring and evaluation system for all relevant sector institutions, • Establish appropriate units in all sector institutions 	All Biological and Chemical Related Conventions

⁹ Each thematic area is expected to be developed into a project later in consultation with the respective regions.

¹⁰ Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period. Activities to be undertaken at federal and regional levels will be categorized.

Table 1. Strategic Goals and Priority... (continued)

3	Reinforce and Equip environmental laboratories	<ul style="list-style-type: none"> Assess the available laboratory equipment in all key institutions, Identify the critical gaps and prioritize in each laboratory to undertake proper lab analysis, Purchase laboratory and field equipment Develop accredited laboratory standards for major activities. 	All Biological and Chemical Related Conventions
4	Improve Environmental Information Exchange system	<ul style="list-style-type: none"> Establish and maintain a national Environmental Information Network Establish and strengthen a national Environmental Information and Documentation system Standardize data collection and documentation 	All Biological and Chemical Related Conventions
5	Ensure proactively the integration of environmental issues in all development activities	<ul style="list-style-type: none"> Prepare EIA guideline to all sectors Make EIA studies mandatory in all development programs and projects. Develop acceptable system for environmental auditing, monitoring and regulating (including GMOs) and implement it. 	All Biological and Chemical Related Conventions

Table 2. Prioritization Matrix for Mainstreaming and Institutionalizing Environmental Issues

Strategic Goal	Scale of Problem ¹	Level of Concern ²	Ability to adequately address the Issue ²	Priority Ranking ³
Educate and Train policy makers and expertise of line ministries about the Environmental conventions	National	High	High	1
Mainstream environmental issues in all line ministries	National	High	High	2
Reinforce and Equip environmental laboratories	National	High	Medium	2
Improve Environmental Information Exchange system	National	High	Medium	3
Ensure proactively the integration of environmental issues in all development activities	Regional	High	High	1

1= Local, National, or Regional

2= Low, Medium, or High

3= Relative Ranking from 1 to 5, where 1 is the most severe problem, 5 is the least severe problem.

Table 3. Priority Activities, Stakeholders and Capacity Building Inputs for Mainstreaming and Institutionalizing Environmental Issues

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
Educate and Train policy makers and expertise of line ministries about the Environmental conventions	Prepare awareness creation manual for Policy makers	EPA	NGOs	X	X		Consultancy
	Provide awareness creation workshop for policy makers	EPA	NGOs, CBOs		X		Environmental education
	Prepare training manual for technical experts	EPA	NGOs, CBOs		X		Consultancy
	Provide training for experts	EPA	NGOs, CBOs	X	X		Environmental education
	Arrange experience sharing tours for experts	EPA	NGOs, CBOs	X	X		Environmental education
Mainstream environmental issues in all line ministries	Review all relevant policies and laws for their impacts on environmental sustainability and make the necessary amendments	EPA	Sector Institutions		X	X	Consultancy/
	Identify missing issues and amend the policies and strategies where applicable.	EPA	Sector Institutions		X	X	Consultancy
	Develop a monitoring and evaluation system for all relevant sector institutions,	EPA	Sector Institutions		X	X	Technical assistance
	Establish and/or strengthen appropriate units in all sector institutions	EPA	Sector Institutions		X	X	Creation & strengthening of institutions, Environmental education

Table 3. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
Reinforce and Equip environmental laboratories	Assess the two labs (EPA and PPD) for technical efficiency, available analytical methods, and facilities,	EPA	PPD		X		Technical assistance
	Identify the critical gaps and prioritize in each laboratory to undertake proper lab analysis,	EPA	PPD		X		Technical assistance
	Purchase laboratory and field equipment	EPA	PPD		X		Infrastructure
	Develop accredited laboratory standards for major activities.	EPA	PPD		X	X	Technical assistance
	Train laboratory and field technicians.	EPA	PPD	X	X		Environmental education
Improve Environmental Information Exchange system	Establish and maintain a national Environmental Information Network	EPA	Sector Institutions		X	X	Technical assistance
	Establish and strengthen a national Environmental Information and Documentation system	EPA	Sector Institutions		X	X	Resource mobilization
	Standardize data collection and documentation	EPA	Sector Institutions	X	X	X	Technical assistance
Ensure proactively the integration of environmental issues in all development activities	Develop sector specific EIA guideline	EPA	MoARD, MoWR, MoH, MoTI		X	X	Technical assistance
	Make EIA studies mandatory in all development programs and projects	EPA	MoARD, MoWR, MoH, MoTI		X	X	Resource mobilization
	Develop standard system for environment auditing, monitoring and regulating (including GMOs) and implement it.	EPA	MoARD, MoWR, MoH, MoTI		X	X	Resource mobilization
	Train experts in relevant EIA methods	EPA	MoARD, MoWR, MoH, MoTI	X	X		Environmental education

5.2 Capacity Building for Community-led Environmental Protection for Improved Livelihood

A. Objectives:

A1. General Objectives

The general objective of the thematic area is to ensure community-led sustainable environmental management with ecological and economic effectiveness for improved livelihood

A2. Specific Objectives

The program will have several projects or components with the following specific objectives.

- Empower communities to develop and run their sustainable development plans through awareness creation and development of bylaws,
- Improve the livelihoods of the communities (Improved food production and productivity, Production of organic fertilizer, Construct food storage facilities, community seed banks)
- Improve livestock productivity and minimize their impact on land degradation by restricting free grazing and introducing cut and curry or stall feeding system.
- Develop new and renewable energy sources
- Promote integrated management of Water resources
- Enhance Biodiversity Conservation

Table 4. Strategic Goals and Priority Activities for Community-Led Sustainable Environmental Management

No	Strategic Goal	Priority activities	Remarks
1	Empower communities to develop and run their sustainable development plans	Awareness Creation on community empowerment	UNCCD, CBD, UNFCC
		Develop bylaws on "community-led environmental protection and sustainable development"	
2	Improve the livelihoods of the communities through a sustainable land use	Improve crop production and productivity	UNCCD, CBD, UNFCC
		Production organic fertilizer	
		Establish community seed banks and food storage facilities	
3	Improve livestock productivity and minimize their impact on land degradation	Develop animal feed requirements	UNCCD, CBD, UNFCC
		Restrict free range grazing and protect uncultivated land for cut and carry system	
4	Development of new and renewable energy sources	Reforestation of protected areas	UNCCD, CBD, UNFCC
		Develop woody biomass production	
		Adopt and popularize low cost and effective Biogas energy	
		Adopt and popularize low cost and effective Solar energy	
5	Integrated management of Water resources	Assess the Spatial and Temporal Distribution of water in the specified areas	UNCCD, CBD, UNFCC
		Study the local community-based water arrangements and the other social and legal frameworks to bring equitable access to water in both rural and urban areas	
		Develop Small-scale community irrigation	
		Adopt low cost technologies for water harvesting and smallholder precision irrigation:	
6	Biodiversity Conservation	Establish 12 in situ conservation sites at different AEZ	CBD
		Establish 10 field gene banks at different AEZ	
		Establish six satellite gene banks for active collection	
		Establish Molecular characterization and tissue labs.	
		Train lab technicians	

Table 5. Prioritization Matrix for Community-led Environmental Protection for Improved Livelihood

Strategic Goal	Scale of Problem ¹	Level of Concern ²	Ability to adequately address the Issue ²	Priority Ranking ³
Empower communities to develop and run their sustainable development plans	Local	High	High	1
Improve the livelihoods of the communities through a sustainable land use	Local	High	High	1
Improve livestock productivity and minimize their impact on land degradation	Local	High	High	1
Development of new and renewable energy sources	Local	High	High	2
Integrated management of Water resources	Local	High	High	2
Biodiversity Conservation	Local	Medium	High	3

1= Local, Re= Relative Ranking from 1 to 5, where 1 is the most severe problem, 5 is the least severe problem.

Table 6. Priority Activities, Stakeholders and Capacity Building Inputs for Community-Led Environmental Protection for Improved Livelihood

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
1) Empower communities to develop and run their sustainable development plans							
1.1) Awareness Creation	Prepare training manual	EPA	NGOs	X	X		Consultancy
	Conduct ToT to Regions	EPA	MoARD, NGOs, CBOs		X		Environmental education
	Adapt the training manual to the local condition	BoEP	BoARD, NGOs, CBOs		X		Resource mobilization Technical assistance
	Train Animators	BoEP	BoARD, NGOs, CBOs	X	X		Environmental education
	Train communities	BoEP	BoARD, NGOs, CBOs	X	X		Environmental education
	Monitoring and evaluation	EPA	MoARD		X		Resource mobilization
1.2) Develop bylaws on "community-led environmental protection and sustainable development"	Prepare sample bylaw (key elements)	EPA	BoARD, NGOs, CBOs		X		Consultancy
	Identify interim committee from every community	BoEP	BoARD, NGOs, CBOs	X	X		Environmental education
	Adapt the sample bylaw to local Condition	BoEP	BoARD, NGOs, CBOs		X		Resource mobilization
	Discussion forum with in the community	BoEP	BoARD, NGOs, CBOs	X	X		Creation and strengthening of community institutions
	Enforce the bylaw	Communities	BoARD, NGOs, CBOs	X	X		Creation and strengthening of community institutions

Table 6. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
2) Improve the livelihoods of the communities through a sustainable land use							
2.1) Improve crop production and productivity	Study and assess the problems of traditional farming practices (location specific)	MoARD	EPA, NGOs, CBOs		X		Technical assistance/ consultancy
	Demonstrate and evaluate technologies under On-farm condition (social & economical)	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Train farmers to bring behavioral change to sustainable land management (Awareness, Knowledge, attitude practices)	MoARD	EPA, NGOs, CBOs		X		Environmental education
	Develop operational local-level technology multiplication provisions	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Demonstrate best practices at field levels	MoARD	EPA, NGOs, CBOs		X		Technologies and best practices
	Document and share lessons learnt and best practices	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Scale-up best practices to other areas	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
2.2) Production organic fertilizer	Prepare a comprehensive and illustrative manual and adapt to local conditions	MoARD	EPA, NGOs, CBOs		X		Technical assistance/ consultancy
	Identify compost making materials at local conditions	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Demonstrate best practices at field levels	MoARD	EPA, NGOs, CBOs		X		Technologies and best practices
	Document and share lessons learnt and best practices	MoARD	EPA, NGOs, CBOs		X		Environmental education
	Scale-up best practices	MoARD	EPA, NGOs, CBOs		X		Resources mobilization

Table 6. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
2.3) Establish community seed banks and food storage facilities and store food for bad years and for the market	Study the socio-economic status of the community	MoARD	EPA, NGOs, CBOs		X		Technical assistance/consultancy
	Design appropriate food storage	MoARD	EPA, NGOs, CBOs		X		Technical assistance/consultancy
	Construct stores	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Develop bylaws and popularize	MoARD	EPA, NGOs, CBOs		X		Environmental education
	Train and implement activities	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
3) Improve livestock productivity and minimize their impact on land degradation							
3.1) Develop animal feed requirements	Study the socio-economic situation of the community with respect to livestock mgt.	MoARD	EPA, NGOs, CBOs		X		Technical assistance/consultancy
	Establish Forage nursery sites for high yielding improved varieties	MoARD	EPA, NGOs, CBOs		X		Technical assistance/consultancy
	Support backyard forage developments	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Enrich the range with improved forage species	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
3.2) Restrict free range grazing and protect uncultivated land for cut and carry system	Create community awareness	MoARD	EPA, NGOs, CBOs		X		Creation and strengthening of community institutions
	Train farmers on improved livestock management	MoARD	EPA, NGOs, CBOs		X		Environmental education
	Limit number of TLU per household	MoARD	EPA, NGOs, CBOs		X		Environmental education
	Facilitate market for livestock products	MoARD	EPA, NGOs, CBOs		X		Resources mobilization

Table 6. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
	Provide efficient veterinary services	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Introduce stall feeding	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Protect uncultivated areas by introducing biological and physical erosion control	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
4) Development of new and renewable energy sources							
4.1) Reforestation of protected areas	Identify adapted tree species	MoARD	EPA, NGOs, CBOs		X		Technical assistance
	Establish nurseries	MoARD	EPA, NGOs, CBOs		X		Technologies and best practices
	Develop bylaws on the equitable and sustainable use	MoARD	EPA, NGOs, CBOs		X		Environmental education
	Reforest protected areas	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
4.2) Develop woody biomass production	Identify adapted tree species	MoARD	EPA, NGOs, CBOs		X		Technical assistance
	Develop bylaws on the equitable and sustainable use	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Establish nurseries managed by the community	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Establish community forestry (e.g., village woodlots)	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Study of the feasibility, acceptability, effectiveness and economic viability of land management	MoARD	EPA, NGOs, CBOs		X		Technical assistance/ consultancy
4.3) Establish utilize Biogas energy	Test different prototypes	MoARD	EPA, NGOs, CBOs		X		Technical assistance
	Demonstrate and popularize the best prototype	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Train the local community to multiply the best prototype at local-level	MoARD	EPA, NGOs, CBOs		X		Resources mobilization

Table 6. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
4.5) Establish and utilize solar energy	Test different prototypes	MoARD	EPA, NGOs, CBOs		X		Technical assistance
	Demonstrate and popularize the best prototype	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
	Train the local community to multiply the best prototype at local level	MoARD	EPA, NGOs, CBOs		X		Resources mobilization
5) Integrated management of Water resources							
5.1) Construct water supply systems for household and livestock uses and agricultural uses	Assess the Spatial and Temporal Distribution of water in the specified areas	MoWR	EPA, MoARD NGOs, CBOs		X		Technical assistance/consultancy
	Study the local community-based water arrangements and the other social and legal frameworks to bring equitable access to water in both rural and urban areas	MoWR	EPA, MoARD NGOs, CBOs		X		Technical assistance/consultancy
	Develop small-scale community irrigation	MoWR	EPA, MoARD NGOs, CBOs		X		Resources mobilization
	Adopt low cost technologies for water harvesting and smallholder precision irrigation:	MoWR	EPA, MoARD NGOs, CBOs		X		Resources mobilization
6) Biodiversity Conservation							
6.1) Establish <i>in situ</i> conservation sites at different AEZ (12)	Conduct baseline survey & identify endangered endemic species for conservation	IBC	EPA, MoARD NGOs, CBOs		X		Technical assistance/consultancy
	Prepare conservation management plan	IBC	EPA, MoARD NGOs, CBOs		X		Technical assistance/consultancy
	Train the community	IBC	EPA, MoARD NGOs, CBOs		X		Environmental education
	On-farm conservation	IBC	EPA, MoARD NGOs, CBOs		X		Resources mobilization
	Monitoring and Evaluation	IBC	EPA, MoARD NGOs, CBOs		X		Resources mobilization

Table 6. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity building level			Capacity building inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
6.2) Establish field gene banks at different AEZ (10) (Field gene banks)	Conduct baseline survey & identify endangered endemic species for field gene bank conservation	IBC	EPA, MoARD NGOs, CBOs		X		Technical assistance/consultancy
	Identify appropriate site and develop site plan	IBC	EPA, MoARD NGOs, CBOs		X		Technical assistance/consultancy
	Conduct intensive management and labeling	IBC	EPA, MoARD NGOs, CBOs		X		Resources mobilization
	Characterize the species	IBC	EPA, MoARD NGOs, CBOs		X		Technical assistance/consultancy
	Publish results and create awareness	IBC	EPA, MoARD NGOs, CBOs		X		Environmental education
6.3) Establish Molecular characterization and tissue labs	Prepare descriptive/appropriate plan for the establishment of the labs,	IBC	EPA		X		Technical assistance
	Build the laboratories	IBC	EPA		X		Resource mobilization
	Purchase laboratory and field equipment	IBC	EPA		X		Infrastructure
	Develop accredited laboratory standards for major activities.	IBC	EPA		X	X	Technical assistance
	Train laboratory and field technicians.	IBC	EPA	X	X		Environmental education

5.3. Rehabilitation of Major Ecosystems

A. Objectives

A1. Overall Objective:

The general objective is to rehabilitate major ecosystems and maintain their essential characteristics, services, and enhance their productivity in a sustainable manner.

A2. Specific Objectives:

3. restore wetlands and use wisely in reducing poverty;
4. rehabilitate biodiversity hotspots;
5. restore natural heritages sites and use sustainably
6. protect cultural heritages sites
7. halt and rehabilitate further degradation of rivers in urban centers and industrial zones
8. halt decline of aesthetic, socio-economic and ecological attributes and values of lakes and enhance their productive capacity Percent forest cover increased to fulfill demands for fuel wood, fodder, construction, industrial use, and other forest products;
9. identify and manage protected areas;
10. design and implement Integrated watershed management programs;
11. utilize and manage gum producing woodlands

Table 7. Strategic Goals and Priority Activities for the Rehabilitation of major Ecosystems

	Strategic Goal¹¹	Priority activities¹²	Remarks
1	Wetlands restored and wisely used and thus contribute in reducing poverty	<ul style="list-style-type: none">• Identify and establish location of wetlands• Assess Ecological functions of wetlands• Assess ecological values of wetlands• Determine status of wetland• Conduct EIA on the rehabilitation of wetlands• Restore wetland to original condition• Make management plan to protect wetlands and to promote access and equity to resource and benefit sharing	Ramsar convention
2	Key Biodiversity Areas rehabilitated and their contribution to the protection and sustainable use of biodiversity hotspots ascertained	<ul style="list-style-type: none">• Identify sites with high biodiversity• Conduct EIA on rehabilitation Key biodiversity areas• Establish their legal status to the level of National Parks• Raise status of all Natural Heritages sites to the level National Parks• Make management plan to protect Key Biodiversity sites and to promote access and equity to resource and benefit sharing	CBD

¹¹ Each thematic area is expected to be developed into a project later in consultation with the respective regions.

¹² Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period Activities to be undertaken at federal and regional levels will be categorized.

Table 7. Strategic Goals and Priority... (continued)

3	Natural heritages sites restored and sustainably used	<ul style="list-style-type: none"> • Conduct EIA on restoration of heritage sites • Raise status of all Natural Heritages sites to the level National Parks • Identify the specific ecological functions and values of the heritage sites • Make a management plan to protect Natural Heritage sites and to promote access and equity to resource and benefit sharing 	CBD
4	Cultural Heritages sites protected	<ul style="list-style-type: none"> • Identify cultural heritages sites and objects • Document their importance and practices • Demarcate the sites • Conduct exploration to find and recognize new ones • Conduct EIA on protection of cultural heritage sites • Make a management plan to protect Cultural Heritages and to promote access and equity to resource and benefit sharing 	CBD
5	Further degradation of rivers in urban centres and industrial zones halted and rehabilitated	<ul style="list-style-type: none"> • Identify pollutants and degrading factors • Identify major pollutants • Prevent municipality sewerage from entering rivers • Clean the rivers beds and sides • Plant suitable trees along the river banks • Conduct EIA on the rehabilitation of rivers in Urban centres and industrial zones • Make a management plan to maintain rehabilitated rivers 	UNCCCCF, UNCCD
6	Further decline of aesthetic, socio-economic and ecological attributes and values of lakes halted and their productive capacity enhanced	<ul style="list-style-type: none"> • Select Lakes for rehabilitation based on the extent of importance and degradation • Study the hydrology of the lakes • Identify ecological functions and values of lakes • Estimate rate of water abstraction and recharge • Identify aesthetic values of lakes • Identify Socioeconomic values of lakes • Produce plans and manuals for rehabilitation of degraded lakes • Conduct EIA on rehabilitation of Ecological functions and values of lakes • Restore lakes to original conditions • Organize Lake resource users • Train Lake resource users, BoARD personnel and the community • Make a management plan to protect lakes from degradation and to promote access and equity to resource and benefit sharing 	UNCCCCF, UNCCD, Ramsar convention

Table 7. Strategic Goals and Priority... (continued)

7	Percent forest cover increased to fulfill demands for fuel wood, fodder, construction, industrial use, and other forest products	<ul style="list-style-type: none"> • Identify site for expansion and reforestation • Determine species composition and abundance • Conduct EIA on increasing forest cover • Expand forest cover • Plant fast growing exotic tree species as buffer between the forest proper and open land • Promote use of non-timber products • Make a management plan to protect forests and to promote access and equity to resource and benefit sharing 	UNCCCF, UNCCD
8	Identifying sites for rehabilitation and managing them as protected areas	<ul style="list-style-type: none"> • Identify degraded sites of economic, ecological and cultural importance • Identify the specific ecological functions and values of the heritage sites • Design mechanisms of rehabilitating the degraded sites based on its nature • Conduct EIA on protecting and managing sites • Restrict interference and ensure protection • Make management plan to protect rehabilitated sites and to promote access and equity to resource and benefit sharing 	CBD
9	Integrated watershed management programmes designed and implemented	<ul style="list-style-type: none"> • Determine critical areas • Build local partnership • Determine challenges and opportunities • Develop land use plan • Conduct EIA on implementing integrated watershed management programmes • Develop soil conservation strategy • Develop water harvesting strategy • Implement plans and strategies and monitor 	UNCCCF, UNCCD
10	Gum producing woodlands and sustainably used	<ul style="list-style-type: none"> • Identify areas of gum producing woodlands • Identify gum producing plant species and type of gums produced in each area • Study the natural and anthropogenic threats on the gum producing plant species • Conduct EIA on sustainable use of gum producing woodlands • Organize gum collectors into cooperatives • Involve the cooperatives in minimizing the threats • Propagate gum producing species to enrich their abundance • Solicit market for export and domestic sale • Make a management plan to protect gum producing woodlands and to promote access and equity to resource and benefit sharing 	UNCCCF, UNCCD, CBD

Table 8. Prioritization Matrix for Rehabilitation of Major Ecosystems

Issue	Scale Problem¹	Level of Concern²	Ability to adequately address the Issue²	Priority Ranking³
Wetlands restored and wisely used and thus contribute in reducing poverty	Local, national and regional	High	Low	1
Key Biodiversity Areas rehabilitated and their contribution to the protection and sustainable use of biodiversity hotspots ascertained	Local, national and regional	High	Low	1
Natural Heritages sites restored and sustainably used	Local, national and regional	High	Low	2
Cultural Heritages sites protected	Local	Medium	Low	2
Further degradation of rivers in urban centres and industrial zones halted and rehabilitated	Local		Low	3
Further decline of aesthetic, socio-economic and ecological attributes and values of lakes halted and their productive capacity enhanced	Local, national and regional	High	Low	4
Percent forest cover increased to fulfill demands for fuel wood, fodder, construction, industrial use, and other forest products	Local, national and regional	High	Low	2
sites identified, rehabilitated and managed as protected areas	Local	Medium	Low	5
integrated watershed management programmes designed and implemented	Local	Medium	Low	5
Gum producing woodlands are sustainably used	Local	Medium	Low	5

1= Local, Regional, National, or Regional

2= Low, Medium, or High

3= Relative Ranking from 1 to 5, where 1 is the most severe problem, 5 is the least severe problem.

Table 9. Priority Activities, Stakeholders and Capacity Building Inputs for Rehabilitation of major Ecosystems

Strategic Goal	Priority Activities	Stakeholder		Capacity Building Level			Capacity Building Inputs
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
Wetlands restored and wisely used and thus contribute in reducing poverty	Identify and establish location of wetlands	R-EPA ¹³	EPA ¹⁴ , NGOs ¹⁵	X	X		Consultancy Resource mobilization
	Assess Ecological functions of wetlands	R-EPA	MoARD ¹⁶ , NGOs, CBOs		X		Consultancy Environmental Education Resource mobilization
	Assess ecological values of wetlands	R-EPA	NGOs, CBOs		X		Resource mobilization
	Determine status of wetland	R-EPA,	NGOs, CBOs	X	X	X	Environmental Education Resource mobilization
	Conduct EIA on the rehabilitation of wetlands	R-EPA	NGOs	X	X		Consultancy Resource mobilization
	Restore wetland to original condition	R-EPA	BoARD, NGOs, CBOs		X		Environmental Education Resource mobilization Technology
	Make management plan to protect wetlands and to promote access and equity to resource and benefit sharing	R-EPA	BoARD, NGOs, CBOs		X	X	Technical Assistance Environmental Education Resource mobilization

¹³ R-EPA stands for the respective Regional Environmental Protection Authority regardless of the different naming in the different regions

¹⁴ The role of the Federal EPA would be to provide technical backstopping and financial support as necessary

¹⁵ The contribution of NGOs could be Financial, Technical and Training

¹⁶ The role of MoARD would be to provide technical backstopping and financial support as necessary

Table 9. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity Building Inputs
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
Key Biodiversity Areas rehabilitated and their contribution to the protection and sustainable use of biodiversity hotspots ascertained	Identify sites with high biodiversity	EPA	BoARD	X	X	X	Consultancy Resource mobilization
	Conduct EIA on rehabilitation Key biodiversity areas	EPA	BoARD	X	X	X	Consultancy Resource mobilization
	Establish their legal status to the level of National Parks	BoARD	EPA, NGOs, CBOs	X	X	X	Environmental Education Resource mobilization
	Restrict interference and ensure protection	BoARD	EPA, NGOs, CBOs	X	X	X	Environmental Education Resource mobilization
	Make management plan to protect Key Biodiversity Sites and to promote access and equity to resource and benefit sharing	BoARD	EPA, NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
Natural Heritages Sites restored and sustainably used	Identify degraded Natural Heritages Sites	EPA	NGOs, CBOs, Communities	X	X	X	Consultancy Environmental Education
	Conduct EIA on restoration of Natural Heritage Sites	EPA	BoARD	X	X	X	Consultancy Resource mobilization
	Raise status of all Natural Heritages sites to the level National Parks	MoARD	MoARD, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Identify the specific ecological functions and values of the heritage sites	EPA	EPA, NGOs, CBOs, Communities		X	X	Consultancy Resource mobilization
	Make management plan to protect Natural Heritages Sites and to promote access and equity to resource and benefit sharing	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization

Table 9. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity Building Level			Capacity Building Inputs
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
Cultural Heritages sites protected	Identify cultural heritages sites and objects	EPA	BoARD, NGOs, CBOs, Communities	X	X		Consultancy Resource mobilization
	Document the importance and practices cultural heritages	EPA	BoARD, NGOs, CBOs, Communities	X	X		Consultancy Resource mobilization
	Demarcate the sites	EPA	BoARD, NGOs, CBOs, Communities	X	X		Consultancy Resource mobilization
	Conduct exploration to find and recognize new ones	EPA	BoARD, NGOs, CBOs, Communities	X	X		Consultancy Resource mobilization
	Conduct EIA on protection of cultural heritage sites	EPA	BoARD, NGOs, CBOs, Communities	X	X		Consultancy Resource mobilization
	Make management plan to protect Cultural Heritages Sites and to promote access and equity to resource and benefit sharing	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization
Further degradation of rivers in urban centres and industrial zones halted and rehabilitated	Identify pollutants and degrading factors	EPA	Municipality, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Conduct EIA on the rehabilitation of rivers in Urban centres and industrial zones	EPA	Municipality, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Identify major pollutants	EPA	Municipality, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Conduct EIA on halting degradation and rehabilitation of degraded rivers in urban centres	EPA	Municipality, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization

Table 9. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity Building Level			Capacity Building Inputs
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Prevent municipality sewerage from entering rivers	Municipality	EPA, NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Clean the rivers beds and sides	Municipality	NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Plant suitable trees along the river banks	Municipality	NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Make a management plan to maintain rehabilitated rivers	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization
Further decline of aesthetic, socio-economic and ecological attributes and values of lakes halted and their productive capacity enhanced	Select Lakes for rehabilitation based on the extent of importance and degradation	EPA	NGOs, CBOs, Communities	X	X	X	Consultancy Environmental Education
	Study the hydrology of the lakes	EPA	MoARD, NGOs, CBOs	X	X	X	Consultancy Resource mobilization
	Identify ecological functions and values of lakes	EPA	MoARD, NGOs, CBOs	X	X	C	Consultancy Resource mobilization
	Estimate rate of water abstraction and recharge	EPA	MoARD, NGOs, CBOs	X	X	X	Consultancy
	Identify aesthetic values of lakes	EPA	MoARD, NGOs, CBOs	X	X	X	Consultancy Resource mobilization
	Identify Socioeconomic values of lakes	EPA	MoARD, NGOs, CBOs	X	X	X	Consultancy Resource mobilization
	Produce plans and manuals for rehabilitation of degraded lakes	EPA	MoARD, NGOs, CBOs	X	X	X	Consultancy Resource mobilization
	Conduct EIA on rehabilitation of Ecological functions and values of lakes	EPA	MoARD, NGOs, CBOs	X	X	X	Consultancy Resource mobilization

Table 9. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity Building Level			Capacity Building Inputs
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Restore lakes to original conditions	BoARD	EPA, MoARD, NGOs, CBOs	X	X	X	Consultancy Resource mobilization Technology
	Organize Lake resource users	BoARD	MoARD, NGOs, CBOs	X	X	X	Resource mobilization
	Train Lake resource users, BoARD personnel and the community	EPA	MoARD, NGOs, CBOs	X	X	X	Resource mobilization
	Make management plan to protect rehabilitated lakes and to promote access and equity to resource and benefit sharing	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization
Percent forest cover increased to fulfil demands for fuel wood, fodder, construction, industrial use, and other forest products	Identify site for expansion and reforestations	EPA	NGOs	X	X		Consultancy Environmental Education Resource mobilization
	Determine species composition and abundance	EPA	MoARD, NGOs, CBOs		X		Consultancy Environmental Education Resource mobilization
	Conduct EIA on increasing forest cover	EPA	MoARD, NGOs, CBOs, Communities		X		Consultancy Environmental Education Resource mobilization
	Expand forest cover	BoARD	MoARD, NGOs, CBOs		X		Resource mobilization
	Plant fast growing exotic tree species as buffer between the forest proper and open land	BoARD	MoARD, NGOs, CBOs	X	X		Environmental Education Resource mobilization
	Promote use of non-timber products	EPA,	NGOs, CBOs	X	X	X	Environmental Education Resource mobilization

Table 9. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity Building Level			Capacity Building Inputs
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Make management plan to protect forests and to promote access and equity to resource and benefit sharing	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization
Identifying Degraded sites for rehabilitation and managing them as protected areas	Identify degraded sites of economic, ecological and cultural importance	EPA	MoARD, NGOs, CBOs, Communities		X	X	Consultancy Resource mobilization
	Identify the specific ecological functions and values of the selected sites	EPA	EPA, NGOs, CBOs, Communities		X	X	Consultancy Resource mobilization
	Design mechanisms of rehabilitating the degraded sites based on its nature	EPA	MoARD, NGOs, CBOs, Communities		X	X	Consultancy Resource mobilization
	Conduct EIA on protecting and managing sites	EPA	MoARD, NGOs, CBOs, Communities		X	X	Consultancy Resource mobilization
	Restrict interference and ensure protection	BoARD	EPA, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Make management plan to protect rehabilitated sites and to promote access and equity to resource and benefit sharing	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization
Designing and implementing integrated watershed management programmes	Identify watersheds of immediate concern	EPA	MoARD,, EPA, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Conduct EIA on rehabilitating and managing them as protected sites	EPA	MoARD,, EPA, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Determine critical areas	BoARD	MoARD, EPA, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization

Table 9. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity Building Level			Capacity Building Inputs
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Build local partnership	BoARD	MoARD, EPA, NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions
	Determine challenges and opportunities	BoARD	MoARD EPA, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Develop land use plan	BoARD	MoARD, EPA, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Develop soil conservation strategy	BoARD	MoARD, EPA, NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Develop water harvesting strategy	BoARD	MoARD, EPA, NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Make management plan to protect watersheds and to promote access and equity to resource and benefit sharing	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization
rehabilitation and sustainable utilization of gum producing woodlands	Identify areas of gum producing woodlands	EPA	MoARD, EPA, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Identify gum producing plant species and type of gums produced in each area	EPA	MoARD, EPA, NGOs, CBOs, Communities	X	X	X	Consultancy Resource mobilization
	Study the natural and anthropogenic threats on the gum producing plant species	EPA	MoARD, EPA, NGOs, CBOs, Communities		X	X	Consultancy Resource mobilization

Table 9. Priority Activities, Stakeholders ... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity Building Level			Capacity Building Inputs
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Conduct EIA on sustainable use of gum producing woodlands	EPA	MoARD, EPA, NGOs, CBOs, Communities		X	X	Consultancy Resource mobilization
	Organise gum collectors into cooperatives	BoARD	MoARD, EPA, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Involve the cooperatives in minimizing the threats	BoARD	MoARD, EPA, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Propagate gum producing species to enrich their abundance	BoARD	MoARD, EPA, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Solicit market for export and domestic sale	MoARD	MoARD, EPA, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Make management plan to protect gum producing woodlands and to promote access and equity to resource and benefit sharing	EPA	BoARD, NGOs, CBOs, Communities	X	X	X	Technical Assistance Environmental Education Resource mobilization Creating and strengthening community institutions

5.4 Enhancing the Environment

A. Objectives

A1. Overall Objectives

To enhance Ecosystems to deliver Goods and Services by way of biodiversity conservation, increasing the green cover of cities, streets and roads and preventing invasive species and reclaiming derelict sites and affected reservoirs.

A2. Specific Objectives:

1. establishing botanical gardens or city parks in each region
2. establishing urban residential green areas
3. Establishing City Parks
4. planting trees on the edges of streets, rural roads and on the edges of rivers in each region
5. identifying and rehabilitating abandoned quarry sites
6. identifying and reclaim water bodies invaded by alien invasive species by each region
7. identifying and reclaiming lands invaded by alien invasive species by each region
8. identifying and reclaiming previously public owned and abandoned state farms by each region
9. identifying and reclaiming non-operational irrigation infrastructures
10. identifying and managing affected water reservoir sites

Table 10. Strategic Goals and Priority Activities for Enhancing the Environment to Deliver Goods and Services

No	Strategic goals ¹⁷	Priority activities ¹⁸	Remarks
1	Botanical gardens or city parks established in Addis Ababa	<ul style="list-style-type: none"> Set criteria for selection of sites suitable for the establishment of Botanical gardens or city parks Prepare a guideline on benefit sharing, entrance fee, and community participation Survey the area and complete landscape designing with environmental requirements of plants in perspective Develop monitoring and Evaluation system. Collect plant species from different parts of the country and propagate in nurseries Transfer plants to the appropriate climatic set ups Open the garden for visitors and other users 	CBD, UNCCCCF, UNCCD
2	Each region sets a target for establishing botanical gardens and implements its target	<ul style="list-style-type: none"> Obtain land at suitable location Conduct EIA on the establishment of the Botanical Garden Fence of land for Botanical Garden Obtain the necessary budget and establish the link with the National Herbarium the Regional Herbarium to be establish Establish a Regional Herbarium Survey the area and complete landscape designing with environmental requirements of plants in perspective Build green houses and install equipment for humidity, temperature and light Collect plant species from different parts of the country and propagate in nurseries Transfer plants to the appropriate climatic set ups Open the garden for visitors and other users 	CBD, UNCCCCF, UNCCD
3	Urban residential green areas established	<ul style="list-style-type: none"> Identify residential green areas in cities and obtain land for more Survey the area and complete landscape designing with environmental requirements of plants in perspective Obtain plants from the Botanical Horticulture and other sources Involve the community in design, caring and benefit sharing 	CBD, UNCCCCF, UNCCD
4	Each City Establishes City Parks	<ul style="list-style-type: none"> Identify Areas for City Parks Set Standards of City Parks Lease city Parks for private investment Link Botanical Gardens with Botanical Gardens Set Affordable fee 	CBD, UNCCCCF, UNCCD
5	Streets in Addis Ababa boarded with trees	<ul style="list-style-type: none"> Make a long lasting city plan Make long lasting and wide pavements Plant appropriate tree species obtained from the Horticulture of the Botanical Garden on the edges of the streets and between them Involve the sub-city and Kebele administration in protecting watering the plants 	CBD, UNCCCCF, UNCCD

¹⁷ Each thematic area is supposed to be developed into a project later in consultation with the respective regions.

¹⁸ Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period Activities to be undertaken at federal and regional levels will be categorized.

Table 10. Strategic Goals and Priority... (continued)

No	Strategic goals ¹⁹	Priority activities ²⁰	Remarks
6	Each region sets a target for planting trees on the edges of rural roads and meets its target	<ul style="list-style-type: none"> • Conduct EIA on planting trees on the edges of rural roads • Select and obtain appropriate and multipurpose tree species from the horticulture of Botanical Garden and other sources • Propagate trees in community nurseries • Plant trees on edges of rural roads • Involve the peasant associations in planting, protecting and watering the trees on the edges of rural roads • Involve communities in benefit sharing 	CBD, UNCCCCF, UNCCD
7	Each major regional city sets its respective target for planting trees on the edges of rivers and meets its target	<ul style="list-style-type: none"> • Conduct EIA on planting trees on the edges of rivers in regional cities • Select and obtain appropriate and multipurpose tree species from the Horticulture of Botanical Garden and other sources • Propagate trees in community nurseries • Plant trees on the edges of rivers • Involve Sub-City Administrations in planting, protecting and watering the trees on edges of rivers • Involve communities in benefit sharing 	CBD, UNCCCCF, UNCCD
8	The appropriate federal institution set targets to plant appropriate plant species on the edges of trans-regional roads and meet its target	<ul style="list-style-type: none"> • Conduct EIA on planting trees on the edges of trans-regional roads • Select and obtain appropriate and multipurpose tree species from the horticulture of Botanical Garden and other sources • Propagate trees in community nurseries • Plant trees on the edges of trans-regional roads • Involve the peasant associations in planting, protecting and watering the trees on edges of rivers • Design and implement awareness creation programs • Involve communities in benefit sharing 	CBD, UNCCCCF, UNCCD
9	Each region sets a target to identify and rehabilitate abandoned quarry sites and meets its target	<ul style="list-style-type: none"> • Identify abandoned quarry sites • Fill quarry sites with soil and debris moved from construction sites • Convert the filled abandoned quarry sites to community parks or community nurseries according to suitability • Involve community in the operation and administration 	CBD, UNCCCCF, UNCCD
10	Each region sets a target to identify and reclaim water bodies invaded by alien invasive species and meets its target	<ul style="list-style-type: none"> • Identify water bodies invaded by alien species • Determine appropriate methods of scooping and damping the plants floating on water or growing on the shores • Design methods of using the damping sites for composting • Involve the community in the scooping and composting activities • Distribute the compost for improving the fertility of sites for road side trees and farmlands • Design awareness creation programs • Involve community in benefit sharing 	CBD, UNCCCCF, UNCCD

¹⁹ Each thematic area is supposed to be developed into a project later in consultation with the respective regions.

²⁰ Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period Activities to be undertaken at federal and regional levels will be categorized.

Table 10. Strategic Goals and Priority... (continued)

No	Strategic goals²¹	Priority activities²²	Remarks
11	Each region sets a target to identify and reclaim lands invaded by alien invasive species and meets its target	<ul style="list-style-type: none"> • Identify alien or invasive species and assess their coverage • Study the biological property of the species • Assess the damage caused and the risks posed by the alien or invasive species • Design awareness creation programs • Design ecosystem centred control methods • Involve community in the control effort 	CBD, UNCCCCF, UNCCD
12	Each region identifies the previously public owned and abandoned state farms, sets target to reclaim them and meets its target	<ul style="list-style-type: none"> • Identify abandoned state farms • Sale the farm to private investors • Design ecosystem centred management system • Provide proper advice and extension service for environmentally friendly agriculture • Involve the community in benefit sharing 	CBD, UNCCCCF, UNCCD
13	Each region identifies non-operational irrigation infrastructures and sets target to reclaim such infrastructures for environmentally sound use	<ul style="list-style-type: none"> • Identify non-operational irrigation infrastructures • Design appropriate reclamation methods • Design methods of minimizing and avoiding water borne diseases during reclamation activities • Design methods of using irrigation water efficiently and avoiding soil salinity • Involve community in reclamation operations 	CBD, UNCCCCF, UNCCD
14	Affected water reservoir sites identified and managed wisely	<ul style="list-style-type: none"> • Identify reservoirs which are degraded, silted, contaminated or affected in other ways • Design methods of reclaiming affected reservoirs depending on type of degradation • Design methods of preventing further degradation • Involve community in the preventive methods • Design awareness creation programs to use water economically and sustainably 	CBD, UNCCCCF, UNCCD

²¹ Each thematic area is supposed to be developed into a project later in consultation with the respective regions.

²² Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period Activities to be undertaken at federal and regional levels will be categorized.

Table 11. Prioritization Matrix for Enhancing the Environment to Deliver Goods and Services

Issue	Scale Problem¹	Level of Concern²	Ability to adequately address the Issue²	Priority Ranking³
Botanical gardens or city parks established in Addis Ababa	Local, national and regional	High	Low	2
Each region sets a target for establishing botanical gardens or city parks and implements its target	Local, national and regional	High	Low	1
Urban residential green areas established	Local, national and regional	High	Low	2
Streets in Addis Ababa boarded with trees	Local	Medium	Low	4
Each region sets a target for planting trees on the edges of rural roads and meets its target	Local	Medium	Low	3
Each major regional city sets its respective target for planting trees on the edges of rivers and meets its target	Local, national and regional	High	Low	4
The appropriate federal institution set targets to plant appropriate plant species on the edges of trans-regional roads and meet its target	Local, national and regional	High	Low	3
Abandoned quarry sites in Addis Ababa identified and rehabilitated	Local	Medium	Low	5
Each region sets a target to identify and rehabilitate abandoned quarry sites and meets its target	Local	Medium	Medium	4
Each region sets a target to identify and reclaim water bodies invaded by alien invasive species and meets its target	Local	Medium	Medium	5
Each region sets a target to identify and reclaim lands invaded by alien invasive species and meets its target	Local, national and regional	Medium	Medium	5
Each region identifies the previously public owned and abandoned state farms, sets target to reclaim them and meets its target	Local	Medium	Medium	5
Each region identifies non-operational irrigation infrastructures and sets target to reclaim such infrastructures for environmentally sound use	Local	Medium	Medium	5
Affected water reservoir sites identified and managed wisely	Local	Medium	Medium	5

Table 12. Priority Activities, Stakeholders and Capacity Building Inputs for Enhancing the Environment to Deliver Goods and Services

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
Botanical gardens or city parks established in Addis Ababa	<ul style="list-style-type: none"> Set criteria for selection of sites suitable for the establishment of Botanical gardens or city parks 	EPA-Addis	National Herbarium (AAU) Municipality-Addis Sub-City Administration	X	X		Technical Assistance Resource mobilization
	<ul style="list-style-type: none"> Prepare a guideline on benefit sharing, entrance fee, and community participation 	EPA-Addis	National Herbarium (AAU) Municipality-Addis Sub-City Administration		X		Consultancy Resource mobilization
	<ul style="list-style-type: none"> Develop monitoring and Evaluation system. 	EPA-Addis	National Herbarium (AAU) Municipality-Addis Sub-City Administration		X	X	Environmental Education Resource mobilization
	Survey the area and complete landscape designing with environmental requirements of plants in perspective	EPA-Addis	National Herbarium (AAU) Municipality-Addis Sub-City Administration		X		Consultancy Technical Assistance Resource mobilization
	Build green houses and install equipment for humidity, temperature and light	EPA-Addis	National Herbarium (AAU) Municipality-Addis Sub-City Administration	X	X	X	Consultancy Environmental Education Resource mobilization Infrastructure
	Collect plant species from different parts of the country and propagate in nurseries	EPA-Addis	National Herbarium (AAU) Municipality- Addis Sub-City Administration		X		Consultancy Environmental Education Resource mobilization
	Transfer plants to the appropriate climatic set ups	EPA-Addis	Municipality National Herbarium (AAU) Sub-City Administration		X	X	Environmental Education Resource mobilization Infrastructure
	Open the garden for visitors and other users	Municipality-Addis	EPA-Addis National Herbarium (AAU) Sub-City Administration		X	X	Technical Assistance Environmental Education Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
Each region sets a target for establishing botanical gardens or city parks and implements its target	Obtain land at suitable location	EPA	Respective Municipality	X	X	X	Resource mobilization Technical Assistance
	Conduct EIA on the establishment of the Botanical Garden	EPA-Addis	National Herbarium (AAU) Municipality of the Regional City Administration		X		Consultancy Resource mobilization
	Fence of land for Botanical Garden or City Park	EPA	Respective Municipality Sub-City Administration	X	X	X	Environmental Education Resource mobilization
	Obtain the necessary budget and establish the link with the National Herbarium the Regional Herbarium to be establish	EPA	Respective Municipality Sub-City Administration	X	X	X	Resource mobilization
	Establish a Regional Herbarium	EPA	Respective Municipality Sub-City Administration National Herbarium (AAU)	X	X	X	Technical Assistance Environmental Education Resource mobilization
	Survey the area and complete landscape designing with environmental requirements of plants in perspective	EPA	Respective Municipality Sub-City Administration Regional Herbarium	X	X	X	Environmental Education Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Build green houses and install equipment for humidity, temperature and light	EPA	Respective Municipality Sub-City Administration Regional Herbarium	X	X	X	Consultancy Environmental Education Resource mobilization
	Collect plant species from different parts of the country and propagate in nurseries	EPA	Respective Municipality Regional Herbarium National Herbarium (AAU)	X	X	X	Consultancy Environmental Education Resource mobilization
	Transfer plants to the appropriate climatic set ups	EPA	Respective Municipality Regional Herbarium National Herbarium (AAU)	X	X	X	Consultancy Environmental Education Resource mobilization
	Open the garden for visitors and other users	Respective Municipality Regional Herbarium	EPA Sub-City Administration	X	X	X	Environmental Education Resource mobilization
Urban residential green areas established	Identify residential green areas in cities and obtain land for more	EPA	Respective Municipality Sub-City Administration		X	X	Environmental Education Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Survey the area and complete landscape designing with environmental requirements of plants in perspective	EPA	Respective Municipality Regional Herbarium National Herbarium (AAU) Sub-City Administration		X	X	Consultancy Resource mobilization
	Obtain plants from the Botanical Horticulture and other sources	Respective Municipality	Regional Herbarium National Herbarium (AAU) Sub-City Administration		X	X	Environmental Education Resource mobilization
	Involve the community in design, caring and benefit sharing	Respective Municipality	Regional Herbarium National Herbarium (AAU) Sub-City Administration		X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions
Establish City Parks in Each city	Identify Areas for City Parks	Respective Municipality	Regional Herbarium National Herbarium (AAU) Sub-City Administration	X	X		Environmental Education Resource mobilization Creating and strengthening Community Institutions

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Set Standards of City Parks	Respective Municipality	Regional Herbarium National Herbarium (AAU) Sub-City Administration		X	X	Environmental Education
	Lease city Parks for private investment	Respective Municipality	Sub-City Administration		X		Environmental Education
	Link Botanical Gardens with Botanical Gardens	Respective Municipality	Regional Herbarium National Herbarium (AAU) Sub-City Administration		X	X	Resource mobilization
	Set Affordable fee	Respective Municipality	Sub-City Administration		X	X	Resource mobilization
Streets in Addis Ababa boarded with trees	Make a long lasting city plan	Municipality-Addis	EPA-Addis	X	X		Environmental Education Resource mobilization
	Make long lasting and wide pavements	Municipality-Addis	EPA-Addis Sub-City Administration	X	X	X	Environmental Education Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Plant appropriate tree species obtained from the Horticulture of the Botanical Garden and other sources on the edges of the streets and between them	Municipality-Addis	EPA-Addis National Herbarium Sub-City Administration	X	X		Consultancy Environmental Education Resource mobilization
	Involve the sub-city and Kebele administration in protecting watering the plants	Sub-City Administration	EPA-Addis Municipality-Addis	X	X		Resource mobilization
Each region sets a target for planting trees on the edges of rural roads and meets its target	Conduct EIA on planting of trees on the edges of rural roads	EPA-Addis	Regional administration		X	X	Consultancy Resource mobilization
	Select and obtain appropriate and multipurpose tree species from the horticulture of Botanical Garden and other sources	Regional Bureau of Capacity Building	Regional Herbarium National Herbarium	X	X	X	Consultancy Resource mobilization Creating and strengthening Community Institutions
	Propagate trees in community nurseries	Regional Bureau of Capacity Building	EPA Regional Herbarium National Herbarium	X	X	X	Consultancy Resource mobilization
	Plant trees on edges of rural roads	Regional Bureau of Capacity Building	EPA Regional Herbarium National Herbarium	X	X	X	Consultancy Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Involve the peasant associations in planting, protecting and watering the trees on the edges of rural roads	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions
	Involve communities in benefit sharing	Regional Bureau of Capacity Building	NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
Each major regional city sets its respective target for planting trees on the edges of rivers and meets its target	Select and obtain appropriate and multipurpose tree species from the horticulture of Botanical Garden and other sources	Respective municipality	Regional Herbarium NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Propagate trees in community nurseries	Respective municipality	Regional Herbarium NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Plant trees on the edges of rivers	Respective municipality	Regional Herbarium NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
	Involve Sub-City Administrations in planting, protecting and watering the trees on the edges of rivers	Respective municipality	NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Involve communities in benefit sharing	Respective municipality	NGOs, CBOs, Communities	X	X	X	Environmental Education Resource mobilization
The appropriate Federal Institution set targets to plant appropriate plant species on the edges of trans-regional roads and meet its target	Conduct EIA on planting of trees on the edges of trans-regional roads	EPA	The appropriate Federal Institution		X	X	Consultancy Resource mobilization
	Select and obtain appropriate and multipurpose tree species from the Horticulture of Botanical Garden and other sources	Regional Bureau of Capacity Building	EPA Regional Herbarium National Herbarium	X	X	X	Environmental Education Resource mobilization
	Propagate trees in community nurseries	Regional Bureau of Capacity Building	EPA Regional Herbarium National Herbarium	X	X	X	Environmental Education Resource mobilization
	Plant trees on the edges of trans-regional roads	Regional Bureau of Capacity Building	EPA Regional Herbarium National Herbarium	X	X	X	Environmental Education Resource mobilization
	Involve the peasant associations in planting, protecting and watering the trees on edges of rivers	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Design and implement awareness creation programs	EPA	Regional Bureau of Capacity Building NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions
	Involve communities in benefit sharing	Regional Bureau of Capacity Building	NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions
Abandoned quarry sites in Addis Ababa identified and rehabilitated	Identify abandoned quarry sites in Addis Ababa	Municipality-Addis	EPA-Addis Communities		X	X	Resource mobilization
	Fill quarry sites with soil and debris moved from construction sites	Municipality-Addis	EPA-Addis Communities		X	X	Resource mobilization
	Convert the filled abandoned quarry sites to city parks or community nurseries according to suitability	Municipality-Addis	EPA-Addis Communities		X	X	Resource mobilization
	Involve community in the operation and administration	Municipality-Addis	EPA-Addis Communities		X	X	Resource mobilization
Each region sets a target to identify and rehabilitate abandoned quarry sites and meets its target	Identify abandoned quarry sites	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization
	Fill quarry sites with soil and debris moved from construction sites	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Convert the filled abandoned quarry sites to community parks or community nurseries according to suitability	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization
	Involve community in the operation and administration	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization Creating and strengthening Community Institutions
Each region sets a target to identify and reclaim water bodies invaded by alien invasive species and meets its target	Identify water bodies invaded by alien species	EPA	Bureau of Capacity Building, NGOs, CBOs, Communities		X	X	Resource mobilization Environmental Education
	Determine appropriate methods of scooping and damping the plants floating on water or growing on the shores	EPA	Bureau of Capacity Building, NGOs, CBOs, Communities		X	X	Consultancy Environmental Education Resource mobilization
	Design methods of using the damping sites for composting	EPA	Bureau of Capacity Building, NGOs, CBOs, Communities		X	X	Consultancy Environmental Education Resource mobilization
	Involve the community in the scooping and composting activities	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization
	Distribute the compost for improving the fertility of sites for road side trees and farmlands	BoARD	EPA, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Design awareness creation programs	EPA	Bureau of Capacity Building, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Involve community in benefit sharing	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions
Each region sets a target to identify and reclaim lands invaded by alien invasive species and meets its target	Identify alien or invasive species and assess their coverage	EPA	Regional Herbarium National Herbarium	X	X	X	Consultancy Environmental Education Resource mobilization
	Study the biological property of the species	EPA	Regional Herbarium National Herbarium	X	X	X	Consultancy Environmental Education Resource mobilization
	Assess the damage caused and the risks posed by the alien or invasive species	EPA	Regional Herbarium National Herbarium	X	X	X	Consultancy Environmental Education Resource mobilization
	Design awareness creation programs	EPA	Bureau of Capacity Building, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Design ecosystem centered control methods	EPA	Regional Herbarium National Herbarium	X	X	X	Consultancy Environmental Education Resource mobilization
	Involve community in the control effort	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization Creating and strengthening Community Institutions
Each region identifies the previously public owned and abandoned state farms, sets target to reclaim them and meets its target	Identify abandoned state farms	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization
	Sale the farm to private investors	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization Creating and strengthening Community Institutions
	Design ecosystem centered management system	EPA	Regional Bureau of Capacity Building NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization
	Provide proper advice and extension service for environmentally friendly agriculture	MoARD	BoARD, NGOs, CBOs, Communities		X	X	Environmental Education Resource mobilization

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
	Involve the community in benefit sharing	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization Creating and strengthening Community Institutions
Each region identifies non-operational irrigation infrastructures and sets target to reclaim such infrastructures for environmentally sound use	Identify non-operational irrigation infrastructures	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization
	Design appropriate reclamation methods	EPA	Regional Bureau of Capacity Building NGOs, CBOs, Communities		X	X	Consultancy Environmental Education Resource mobilization
	Design methods of minimizing and avoiding water borne diseases during reclamation activities	EPA	Ministry of Health		X	X	Consultancy Environmental Education Resource mobilization
	Design methods of using irrigation water efficiently and avoiding soil salinity	EPA	Ministry of Water and Sewerage		X	X	Consultancy Environmental Education Resource mobilization
	Involve community in reclamation operations	Regional Bureau of Capacity Building	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization Creating and strengthening Community Institutions

Table 12. Priority Activities, Stakeholders... (continued)

Strategic Goal	Priority Activities	Stakeholder		Capacity level			Capacity type
		Focal Institution	Other Stakeholders	Individual	Institutional	Systemic	
Affected water reservoir sites identified and managed wisely	Identify reservoirs which are degraded, silted, contaminated or affected in other ways	Ministry of Water and Sewerage	EPA, NGOs, CBOs, Communities		X	X	Resource mobilization
	Design methods of reclaiming affected reservoirs depending on type of degradation	EPA	Ministry of Water and Sewerage		X	X	Consultancy Environmental Education Resource mobilization
	Design methods of preventing further degradation	EPA	Ministry of Water and Sewerage		X	X	Consultancy Environmental Education Resource mobilization
	Involve community in the preventive methods	EPA	Ministry of Water and Sewerage		X	X	Environmental Education Resource mobilization Creating and strengthening Community Institutions
	Design awareness creation programs to use water economically and sustainably	EPA	Ministry of Water and Sewerage		X	X	Consultancy Environmental Education Resource mobilization

5.5 Action Plan Management of Adverse Impacts of Municipal Waste

Basis for Action

Waste management is at present a major environmental problem in most regions in Ethiopia. In many cases, wastes are either not collected or the collected wastes are disposed of in an environmentally harmful manner. Waste dumps are often a significant source of pollution to the ambient air, soil and water and a significant risk for human health and public welfare. The categories of wastes that are of primary concern in major urban areas of Ethiopia are rubbish generated from households, health care facilities, schools, industries and other business centers. Significant portion of the wastes generated can be considered as hazardous waste according to the categories listed under the Basel Convention.

Future-oriented management of waste must include, on one side, efforts for prevention of wastes with the aim of efficient utilization of waste as resources and, on the other side, the collection and treatment of waste, which has been generated (i.e. had not been prevented). Waste prevention is often referred to as a fundamental priority, but it can neither substitute nor reduce the top priority of collection and treatment of waste. Waste prevention refers to both the supply side as well as the demand side for goods and services. Related issues and topics are, for example, cleaner production technologies, environmentally friendly products and environmentally conscientious demand by consumers.

The need for disposal of waste requires collection, preferably with separation of wastes at source (separate collections) in order to provide for cost-effective and environmentally friendly treatment of waste, including reuse, recycling and recovery of materials and energy. Solid residues from waste treatment must be disposed in controlled landfills according to state-of-the-art

Special attention needs to be given to the growing effects of urbanization on water demands and usage and to the critical role played by local and municipal authorities in managing the supply, use and overall treatment of water and wastewater. Sanitation and sewerage coverage of Ethiopia is one of the lowest in Africa.

The strategic goals are prepared based on the following principles of Sustainable and Integrated Solid Waste Management (SISWM):

- Supportive to good urban governance:
- Consideration of cost recovery mechanisms for long-term financial sustainability

- Conservation of natural resources
- Fostering stakeholder participation
- Fostering environmentally appropriate technologies
- Appropriate levels of source segregation, recycling, and resource recovery
- Strategic facility planning and development
- Building institutional capacity
- Enhancing private sector involvement

Although the amount and type of waste generation vary from region to region, a framework for the management of waste needs to be established at the federal level. The plan should focus on how the country intends to manage the increasing amount of solid waste and wastewater produced each year with vision, time-related targets, the provision of waste data, the role of key organizations, issues relating to specific waste streams (such as hazardous waste), and key principles applicable to developing a system for sustainable waste management.

A. Objectives

A1. Overall Objectives:

The general objective is to ensure an integrated waste management system that guarantees public and environmental health and create assets of importance to societal benefit and control trans-boundary movement of hazardous wastes within 10 years. By the year 2016, a system for managing solid and hazardous wastes will have been established. The recycling of solid wastes will be developed and pollution caused by hazardous wastes will have been basically controlled. After the year 2016, an environmental management system for solid and hazardous wastes should be in regular operation, and the pollution caused by solid and hazardous wastes should be basically under control.

A2. Specific Objectives:

1. to identify priority activities required and capacity needs to establish a basic system of laws, policies and standards for solid wastes, to perfect management organizations at federal, regional and zonal levels, and to set up waste management systems in federal, regional and zonal cities/towns for the management 70 % of residential solid waste in Ethiopia
2. to identify priority activities and capacity needs to establish waste reduction, reuse, recycling, and recovery practices in Ethiopia. 50 % reduction in 10 years is anticipated.
3. to identify priority activities and capacity needs to establish appropriate centralized recycling, treatment and disposal systems for hazardous and non-hazardous waste. Each chartered, regional

and zonal city/town shall have municipal waste treatment/ or disposal facility. Hazardous wastes shall be managed in collaboration.

4. to identify priority activities and capacity needs to manage the future impact of hazardous waste in Ethiopia and control trans-boundary movement of hazardous wastes
5. to identify major stakeholders to manage solid waste in Ethiopia and clarify their respective roles
6. to establish a framework for the management municipal wastewater in federal, regional and zonal cities/towns

The three-phased approach

Waste management requires formulation of regulatory framework at the national level and management plan at both national and regional and city/town levels. The amount and type of waste generation is strongly linked to population, urbanization, and industrialization. The extent of problems related to waste management might vary from region to region. The 10-year plan should be based on the extent of the problem and be prioritised. It is considered that the 10-year plan on waste management should cover at least the capital city of Ethiopia, the regional cities/towns, and zonal towns of the respective region. The three-phased approach proposed to manage the adverse effect of municipal waste is:

Phase 1: Preparation of regulatory framework, policies and standards for solid and liquid wastes, arrangement of institutional set up at different levels, preparation of waste management plan, preparation of manuals, and training of trainers

Phase 2: Planning and running pilot projects on activities selected from each strategic goal area on the basis of prioritisation. For regions, the pilot project can be conducted in regional cities/towns and the experience gained can be used to implement the activities in the cities/towns included under the 10-year plan. In the case of Addis Ababa City, it is suggested that the activities listed under the strategic goal “Segregate, store, reuse or recycle and dispose 70 percent of municipal solid wastes emanating from residential houses” should be implemented in all Kifle Ketemas (zones) as a pilot project. The City Government on the basis of prioritization and capacity to accomplish the activities during the 10-year time can schedule the remaining activities.

Phase 3: Implementation of all the activities by the chartered, regional and zonal cities/towns with the aim to divert increasing volumes of biodegradable municipal waste away from landfill and move the

treatment of waste up the waste hierarchy (Reduce, Reuse, Recycle) to improve the sustainability of waste management.

Table: Summary of the target levels to manage the adverse impact of municipal waste to be achieved in 10 Years

No.	Strategic Goal	Targets for 10 Years	Remark
1	Segregate, store, reuse or recycle and dispose of municipal solid wastes emanating from residential houses	70 %	Federal, regional zonal cities/towns
2	Manufacture containers and wrappers from recyclable or biodegradable materials	1	Federal level
3	<i>Recyclable cans and glass bottles</i> taken back by the concerned manufacturers, reused, recycled or disposed of	70 %	Federal, regional zonal cities/towns
4	<i>Recyclable</i> plastic containers taken back by the concerned manufacturers, reused, recycled or disposed of	50 %	Federal, regional zonal cities/towns
5	Use of refillable printer inks by all government offices,	70 %	Federal, regional zonal cities/towns
6	Use of recycled paper by government offices	50 %	Federal, regional zonal cities/towns
7	Use of recyclable plastics by government and non government offices	50 %	Federal, regional zonal cities/towns
8	Collection, treatment and safe disposal of Medical wastes (Treatment to render the waste non-infectious and segregation to prevent exposure)	70 %	Federal and regional cities/towns
9	Obligatory use of construction debris for refilling of excavated or quarry by construction agencies	70 %	Federal, regional, and zonal cities/towns
10	Establishment of municipal solid waste landfill sites and upgrading of existing waste disposal sites to acceptable level Establish joint municipal solid waste landfill sites	At least 1 for each	Federal, regional and zonal cities/towns
11	Utilization of used oils and tires as energy source for cement and other industries	80 %	Federal, regional and zonal cities/towns
12	Private enterprises engage in producing commodities minimize waste generation	70 %	Federal, regional zonal cities/towns
13	Manage the impact of hazardous waste	50 %	Federal, regional and zonal cities/towns
14	Reuse, recycle and dispose municipal wastewater	70 %	Federal, regional and zonal cities/towns

The priority activities considered are in the area of:

- Integrated Waste Management Planning
- Waste Information System
- Waste Minimization
- Recycling
- Waste Collection and Transportation
- Waste Treatment
- Waste Disposal

The Implementing Instruments considered include:

Institutional Development

Capacity Building

Legislative requirements

Funding

Implementation of the Polluter Pays Principle

Public Participation and Partnerships, Education and Awareness

Partnership with NGOs and CBOs

A number of strategic priority activities that need to be addressed as a matter of urgency are identified and action plans are developed for their implementation.

Table Strategic Goals and Priority Activities for the Management of Adverse Impact of Municipal Waste

No	Strategic Goals ²³	Priority activities ²⁴	Links
1	Segregate, store, reuse or recycle and dispose 70 percent of municipal solid wastes emanating from residential houses	Institutional setup for integrated waste management in the respective regions Establish national solid waste management policy and regulations Preparation of solid waste management plan Ensure that regional administrations and city administrations adopt solid waste management policy and plan Create public awareness to minimize, reuse and recycling of residential waste Promote composting of yard wastes and/or food waste and Construction of centralized composting systems Promote the construction of small scale biogas production systems Estimation of residential waste generation rate Establish efficient mechanisms for segregation of waste at source Define the types of containers and the duration for storage for different waste categories Define reasonable amount of money the residents should pay for the management of waste Design systematic collection strategy for disposable and recyclables wastes Equip all major streets, public centers, governmental offices and recreational areas with labeled litterbins Prepare guidelines and requirements for collection of waste, transportation of waste and disposal of waste	Basel Convention, Pollution Control Proclamation, Regional Capacity Needs Assessment Document
2	Manufacture containers and wrappers from recyclable or biodegradable materials	Establish incentive mechanisms for packaging industry Preparation of preferred packaging guidelines Promote modifications to package design Introduce eco-labeling mechanisms to distinguish environmentally preferred packages	Basel Convention, Pollution Control Proclamation, Agenda 21,

²³ Each strategic goal is supposed to be developed into a project later in consultation with the respective regions.

²⁴ Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period Activities to be undertaken at federal and regional levels will be categorized.

Table Strategic Goals and Priority ... (continued)

3	<i>Recyclable cans and glass bottles</i> taken back by the concerned manufacturers, reused, recycled or disposed of	Formulate regulation on manufacturers and suppliers responsibility Establish local recycling centers Strengthen the existing recycling systems for reuse of beverage bottles Facilitate the take back of damaged bottles and cans for recycling by the manufacturers Develop strategy to control the import and/or reuse and recycle imported bottles and cans	Basel Convention, Pollution Control Proclamation, Agenda 21,
4	<i>Recyclable plastic containers</i> taken back by the concerned manufacturers, reused, recycled or disposed of	Establish regulation for manufacturers, distributors and consumers responsibility Establish local plastic recycling centers Facilitate the establishment of plastic process scrap recycling system (primary waste) Establish post-use plastic recycling system (Commercial waste, agricultural waste, municipal waste) Facilitate the establishment of biodegradable plastics manufacturing system Develop strategy to control on import and/or to recycle, reuse and dispose imported plastic containers	National waste management strategies and action plans South Africa
5	Use of refillable printer inks by all government offices,	Policy for procurement of printer inks Promote import of refillable printer inks Set systems for collection and refilling, reputable supplier that will guarantee quality and reliability is important	
6	Use of recycled paper by government offices	Policy for procurement of papers and equipments that minimize paper waste generation that can use recycled papers such as photocopiers, fax machines, and printers Guidelines for usage of office papers Guidelines for collection of used papers from offices Promote the replacement of imported pulp by recycled paper in paper and pulp industries	
7	Use of recyclable plastics by government and non government offices	Policy for procurement of recyclable plastics by government offices such as Polyethylene (PE), Polypropylene (PP), Polystyrene (PS), Polyvinyl chloride (PVC) Promote the use of recycled papers by organizations other than government offices	

Table Strategic Goals and Priority ... (continued)

8	Collection, treatment and safe disposal of Medical wastes (Treatment to render the waste non-infectious and segregation to prevent exposure)	Waste handling and disposal Policy formulation for health care facilities Estimation of the type amount of medical waste generated in different facilities Preparation of national plan for healthcare waste management Prepare guidelines for the proper handling and transportation of hazardous medical waste and non-hazardous medical waste in each health care facility Incineration of hazardous waste in an improved incineration facility (centralized) or a dedicated small incinerator and disposal of ashes Establish monitoring system to control the performance of the incinerators in accordance with the environmental requirements Promote the use of safer products by health care facilities	Basel Convention,
9	Obligatory use of construction debris for refilling of excavated or quarry by construction agencies	Formulate regulation for construction and demolition debris waste management Establish system to separate construction and demolition debris into recyclable and non-recyclable materials Define inert debris (as concrete, brick, concrete block, uncontaminated soil, rock and gravel) for recycling and reused as clean fill material or raw material for construction Establish efficient system for collection and disposal of non-inert materials	
10	Establishment of municipal solid waste landfill sites And upgrading of existing waste disposal sites to acceptable level Establish joint municipal solid waste landfill sites	Formulate regulation for the design and management of municipal Land fill operation Prepare EIA guidelines Preparation of technical requirements for the construction of sanitary land fill systems Construction of landfill systems in chartered, regional and zonal cities/towns Preparation of guidelines for the proper operation of land fill Preparation of guidelines for monitoring requirements for Landfills during operation and after closure	

Table Strategic Goals and Priority ... (continued)

11	Utilization of used oils and tires as energy source for cement and other industries	<p>Quantitative estimation of waste oil generation in different cities and towns</p> <p>Facilitate the establishment of local waste oil collection centers</p> <p>Facilitate the establishment of regional waste oil collection centers</p> <p>Facilitate the establishment of the necessary installations at the cement plants including the required pretreatments</p> <p>Quantitative estimation of scrap tires and rubber in different cities and towns</p> <p>Investigate the feasibility to use as supplement fuel or to recover other resources</p> <p>Identify the required pretreatment processes before using in cement kiln</p>	
12	Private enterprises engage in producing commodities minimize waste generation	<p>Promote voluntary implementation of environmental management system such the ISO 1400 series of standards</p> <p>Estimation of waste generation rate from private enterprises</p> <p>Establish efficient mechanisms for segregation of waste at Source</p> <p>Define the types of containers and the duration for storage</p> <p>Define reasonable amount of money the enterprises should pay for the management of unavoidable waste</p> <p>Design systematic collection strategy for disposable and recyclables wastes</p> <p>Equip all enterprises with containers for disposable and recyclable wastes</p> <p>Prepare guidelines for collection, transport and final disposal in sanitary landfill</p> <p>Support the private enterprises by providing information and technical assistance</p>	

Table Strategic Goals and Priority ... (continued)

13	Mange the impact of hazardous waste	<p>Formulate and implement waste minimization criteria for the major industries generating hazardous wastes</p> <p>Establish a regulatory infrastructure for transport control/checks/inspections</p> <p>Establish registration procedures and prepare national hazardous waste management plan</p> <p>Conduct inventory on the generation of wastes specified in the Annex of the Basel and Bamako Conventions, and formulate national definition of hazardous waste</p> <p>Establish national data base</p> <p>Develop practical guidelines for sampling liquid and solid hazardous wastes and analysis</p> <p>Provide training for persons involved in hazardous waste analysis</p> <p>Establish laboratory infrastructure for the analysis of hazardous wastes and other wastes</p> <p>Promote the use of best practice to avoid or minimize the generation of hazardous waste, such as the use of clean methods;</p> <p>Develop practical guidelines for the establishment of an adequate standard of technology and pollution control to dispose of the hazardous waste</p> <p>Provide training for Persons involved in the disposal of hazardous wastes</p> <p>Adopt mechanisms for tracking down of illegal transport of hazardous substances</p> <p>Support research and development projects on hazardous wastes. Emphasize research into methods of conducting risk assessments on hazardous wastes, of recycling heavy-metal bearing wastes and of constructing regional centralized secure landfills and incineration plants;</p> <p>Create demonstration projects to serve as models for the management of the treatment and disposal of hazardous wastes.</p>	
14	Reuse, recycle, treat and dispose municipal wastewater	<p>Prepare standards and guidelines</p> <p>Implement urban storm-water run-off and drainage programmes</p> <p>Promote of recycling and reuse of waste water</p> <p>Identify and implement appropriate wastewater treatment technologies</p> <p>Reuse, recycle and dispose municipal wastewater</p> <p>Establish monitoring system</p>	

Table Prioritization Matrix for the Manage of Adverse Impacts of Municipal Waste

Strategic goals	Scale Problem¹	Level of Concern²	Ability to adequately address the Issue²	Priority Ranking³
Segregate, store, reuse or recycle and dispose 70 percent of municipal solid wastes emanating from residential houses	National	High	Low	1
Manufacture containers and wrappers from recyclable or biodegradable materials	National	High	Low	3
<i>Recyclable cans and glass bottles</i> taken back by the concerned manufacturers, reused, recycled or disposed of	National	Low	Medium	4
<i>Recyclable</i> plastic containers taken back by the concerned manufacturers, reused, recycled or disposed of	National/Regional	Medium	Low	3
Use of refillable printer inks by all government offices	National/Regional	Medium	Medium	3
Use of recycled paper by government offices and Non government offices	National /Regional	High	Medium	1
Use of recyclable plastics by government and non government offices	National/Regional	Low	Low	5
Collection, treatment and safe disposal of Medical wastes	National	High	Low	1
Obligatory use of construction debris for refilling of excavated or quarry by construction agencies	Local	High	Medium	2
Establishment of municipal solid waste landfill sites And upgrading of existing waste disposal sites to acceptable level	National	High	Medium	1
Utilization of used tires and oils as energy source for cement and other industries	National/Regional	High	Low	2
Private enterprises engage in producing commodities minimize waste generation	National	High	Low	1
Mange the future impact of hazardous waste	National/Regional	Medium	Low	2
Reuse, recycle and dispose municipal wastewater	Regional/Local	High	Medium	1

1= Local, National, or Regional, 2= Low, Medium, or High, 3= Relative Ranking from 1 to 5, where 1 is the most severe problem, 5 is the least severe problem.

Table Priority Activities to Manage the Adverse Impacts of Municipal Waste and capacity building requirements

Strategic Goals ²⁵	Priority activities ²⁶	Stakeholder		Capacity Level			Capacity Building Inputs
		Focal Institution ²⁷	Other Stakeholder	Individual	Institutional	Systemic	
Segregate, store, reuse or recycle and dispose 70 percent of municipal solid wastes emanating from residential houses	Institutional setup for integrated waste management in the respective regions	Municipalities, R-EPA	FEPA, BOH		×	×	Consultancy, infrastructure, Resource mobilization
	Establish national solid waste management policy	FEPA ²⁸ ,	R-EPA Municipalities MOH, R-BOH			×	Consultancy
	Preparation of solid waste management plan	Municipalities ²⁹ R-EPA ³⁰	MOH	×	×		Consultancy, Technical assistance
	Ensure that regional administrations and city administrations implement solid waste management plan	R-EPA	Municipalities, MOH	×	×		Technical assistance
	Promote composting of yard wastes and/or food wastes and Construction of large scale composting	Municipalities	R-EPA	×	×		Training, infrastructure, Resource mobilization

²⁵ Each thematic area is supposed to be developed into a project later in consultation with the respective regions.

²⁶ Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period Activities to be undertaken at federal and regional levels will be categorized.

²⁷ Executing institutions

²⁸ Represents the Federal Environmental Protection Authority

²⁹ Respective municipalities of cities and towns in the regions

³⁰ Represents the respective Regional Environmental Protection Organs

Table Priority Activities to Manage... (continued)

	Promote the construction of small scale biogas production systems	Municipalities	R-EPA	×	×		Technical assistance, infrastructure
	Estimate residential waste generation rate and establish data base	Municipalities	R-EPA	×			Consultancy
	Establish efficient mechanisms for segregation of waste at Source	Municipalities	R-EPA, R-BOH			×	Consultancy, infrastructure, Resource mobilization
	Define the types of containers for storage	Municipalities	R-EPA			×	
	Design and implement systematic collection strategy for disposables and recyclables	Municipalities	R-EPA	×	×		Consultancy, Resource mobilization
	Equip all major streets, public centers, governmental offices and recreational areas with labeled litterbins	Municipalities	R-EPA		×		Technical assistance
	Prepare guidelines for collection, transport and disposal in sanitary landfill	EPA, R-EPA	Municipalities	×	×		Consultancy, Resource mobilization
	Promote NGO and private sector participation on waste management	Municipalities, R-EPA	NGO				

Table Priority Activities to Manage... (continued)

Manufacture containers and wrappers from recyclable or biodegradable materials	Establish incentive mechanisms for packaging industry	FEPA, R-EPA	MOTI			×	Resource mobilization
	Preparation of preferred packaging guidelines (No packaging; Minimal packaging; Consumable, returnable or reusable packaging; and Recyclable packaging or recycled material packaging)	FEPA, R-EPA	MOTI, UNIDO	×	×		Consultancy
	Modifications to package design (Manufacture of refillable bottles, Manufacture of reusable packaging, Manufacture of biodegradable plastics)	Industries	FEPA, UNIDO, ECPC	×			Technical assistance, Technology
	Introduce eco-labeling mechanisms to distinguish environmentally preferred packages	EPA, R-EPA	Municipalities, Industries, UNIDO, ECPC			×	Technical assistance
<i>Recyclable cans and glass bottles</i> taken back by the concerned manufacturers, reused, recycled or disposed of	Formulate regulation on manufacturers responsibility	FEPA, R-EPA	Municipalities, ECPC			×	Consultancy
	Establish local recycling centers	Municipalities	R-EPA, ECPC			×	infrastructure, Resource mobilization
	Strengthen the existing recycling systems for reuse of beverage bottles	Municipalities	R-EPA		×		Consultancy
	Facilitate the take back of damaged bottles and cans for recycling by the manufacturers	Municipalities	R-EPA, Industries, ECPC	×	×		Training
	Develop strategy to control the import and/or reuse and recycle imported bottles and cans	FEPA, R-EPA	Municipalities, Customs authority			×	

Table Priority Activities to Manage... (continued)

Recyclable plastic containers taken back by the concerned manufacturers, reused, recycled or disposed of	Review of the likely ways by which plastics are used and reused in Ethiopia	FEPA	Municipalities, ECPC	×	×		Consultancy
	Establish regulation for manufacturers and consumers responsibility	FEPA	Municipalities, ECPC			×	Consultancy
	Establish local plastic recycling centers	Municipalities	FEPA, Private sector		×		Infrastructure
	Facilitate the establishment of plastic process scrap recycling system (primary waste)	FEPA, Industries	UNIDO, ECPC		×	×	Training, Technology transfer
	Establish post-use plastic recycling system (Commercial waste, agricultural waste, municipal waste)	FEPA, Industries	Municipalities, UNIDO, ECPC			×	Infrastructure, Technology transfer, Technical assistance
	Facilitate the establishment of biodegradable plastics manufacturing system	FEPA, Industries	Municipalities, UNIDO, ECPC	×	×		Technology transfer
	Develop strategy to control on import and/or to recycle, reuse and dispose imported plastic containers	FEPA, Industries	Municipalities, Customs Authority, MOTI			×	Resource mobilization
Use of refillable printer inks by government offices	Policy for purchase of printer inks	FEPA	ECPC, Ministry of Finance		×	×	Resource mobilization
	Promote import of refillable printer inks	FEPA	MOTI		×	×	Education, resource mobilization
	Set systems for collection and refilling by reputable supplier that will guarantee quality and reliability	Municipalities	R-EPA			×	Resource mobilization

Table Priority Activities to Manage... (continued)

Use of recycled paper by government offices	Policy for purchase of papers and equipments that minimize paper waste generation that can use recycled papers such as photocopiers, fax machines, and printers	FEPA, R-EPA	ECPC, Ministry of Finance			×	Resource mobilization
	Guidelines for usage of office papers	FEPA, R-EPA					Resource mobilization
	Guidelines for collection of used papers from offices	FEPA, R-EPA	UNIDO, ECPC				Resource mobilization
	Promote the replacement of imported pulp by recycled paper in paper and pulp industries	FEPA	ECPC, Ministry of Trade and Industry			×	Resource mobilization
Use of recyclable plastics by government and non government offices	Policy for purchase of recyclable plastics (Polyethylene (PE), Polypropylene (PP), Polystyrene (PS), Polyvinyl chloride (PVC))	FEPA, R-EPA	UNIDO, ECPC, Ministry of Finance		×	×	Resource mobilization
Collection, treatment and safe disposal of Medical wastes	Waste handling and disposal policy formulation for health care facilities	FEPA, MOH, R-EPA	Municipalities			×	Resource mobilization
	Estimation of the type and amount of medical waste generated in different facilities	Municipalities, R-EPA, BOH	FEPA	×	×		Consultancy
	Preparation of national and regional plan for healthcare waste management	FEPA, MOH, R-EPA	BOH, Municipalities	×	×	×	Training

Table Priority Activities to Manage... (continued)

	Prepare guidelines for the proper handling and transportation of infectious medical waste and non-infectious medical waste in each health care facility	FEPA	MOH	×	×		Training, resource mobilization
	Incineration of infectious waste in an improved incineration facility (centralized) or a dedicated small incinerator and disposal of ashes	Municipalities, Private sector	FEPA, R-EPA	×	×		Training, Technical assistance, resource mobilization
	Establish monitoring system to control the performance of the incinerators in accordance with the environmental requirements	FEPA	R-EPA	×	×		Training, infrastructure
Obligatory use of construction debris for refilling of excavated or quarry by construction agencies	Formulate regulation for construction and demolition debris management	Municipalities, R-EPA	FEPA			×	Resource mobilization
	Establish system to separate construction and demolition debris into recyclable and non-recyclable materials	Municipalities	FEPA, R-EPA			×	Resource mobilization
	Define inert debris (as concrete, brick, concrete block, uncontaminated soil, rock and gravel) for recycling and reused as clean fill material	FEPA		×			Training
	Establish efficient system for collection and disposal of non-inert materials	Municipalities	R-EPA				Resource mobilization

Table Priority Activities to Manage... (continued)

Upgrading of existing waste disposal sites to acceptable level and establishment of municipal solid waste landfill sites	Formulate regulation for the design and management of municipal solid waste landfill operation	FEPA, R-EPA	Municipalities		×	×	Consultancy
	Prepare EIA guidelines and set as a requirement	FEPA, R-EPA					Consultancy
	Preparation of technical requirements for the construction of sanitary land fill systems	FEPA, R-EPA	Municipalities	×			Consultancy, Training
	Construction of landfill systems in major towns and cities	Municipalities	FEPA, R-EPA	×	×		Technical assistance, infrastructure, resource mobilization
	Preparation of guidelines for the proper operation of landfills	FEPA, R-EPA	Municipalities	×	×		Training
	Preparation of guidelines for monitoring requirements for Landfills during operation and after closure	FEPA, R-EPA	Municipalities	×	×		Training
Utilization of used tires and oils as energy source for cement and other industries	Quantitative estimation of waste oil generation in different cities and towns	R-EPA, Municipalities		×	×		Consultancy
	Facilitate the establishment of local waste oil collection centers	R-EPA	Municipalities, oil companies		×		Infrastructure

Table Priority Activities to Manage... (continued)

	Facilitate the establishment of regional waste oil collection centers	R-EPA, Municipalities	EPA		×		Infrastructure
	Facilitate the establishment of the necessary installations at the cement plants	FEPA	Cement factories, MOTI		×		Infrastructure
	Quantitative estimation of scrap tires and rubber in different cities and towns	R-EPA	Municipalities	×	×		Consultancy
	Facilitate the establishment of local municipal collection centers	R-EPA, Municipalities	Ministry of Trade and Industry		×	×	Infrastructure
	Establish onsite storage at cement plant	Cement factories	FEPA		×		Infrastructure
	Equip an existing cement kiln with a technical system for processing and incineration of scrap tires and abandoned rubber	Cement factories	FEPA	×	×		Technical assistance
Private enterprises engage in producing commodities minimize waste generation	Promote voluntary implementation of environmental management system such the ISO 1400 series of standards	FEPA, ECPC	Industries, Municipalities	×	×		Training, resource mobilization
	Estimation of waste generation rate from private enterprises	Municipalities	R-EPA	×			Training
	Establish efficient mechanisms for segregation of waste at Source	Municipalities	R-EPA	×	×		Training

Table Priority Activities to Manage... (continued)

	Define the types of containers and the duration for storage	Municipalities	R-EPA	×			Resource mobilization
	Define reasonable amount of money the enterprises should pay for the management of unavoidable waste	Municipalities	R-EPA			×	Consultancy
	Design systematic collection strategy for disposable and recyclables wastes	Municipalities	R-EPA		×		Infrastructure
	Equip all enterprises with containers for disposable and recyclable wastes	Municipalities	R-EPA		×	×	Infrastructure
	Prepare guidelines for collection, transport and final disposal in sanitary landfill	FEPA, R-EPA	Municipalities	×	×		Resource mobilization
	Support the private enterprises by providing information and technical assistance	FEPA, R-EPA	Municipalities		×		Resource mobilization
Manage the future impact of hazardous waste	Establish a regulatory infrastructure and enforcement mechanisms on import/export of chemicals and on the transport control/checks/inspections of chemicals and hazardous wastes	FEPA, R-EPA	MOARD, MOH, Municipalities, Customs Authority, UNEP, UNIDO			×	Resource mobilization
	Establish registration procedures and prepare national hazardous waste management plan	FEPA, R-EPA	MOARD Municipalities, Customs Authority, UNEP, UNIDO	×	×		Consultancy, infrastructure

Table Priority Activities to Manage... (continued)

	Conduct inventory on the generation of wastes specified in the Annex of the Basel and Bamako Conventions, and formulate national definition of hazardous waste	R-EPA, Municipalities	MOA, ELPA, Ministry of Mines Energy , UNEP, UNIDO,	×	×		Consultancy, training, infrastructure
	Develop practical guidelines for sampling liquid and solid hazardous wastes and analysis	FEPA	QSA	×	×		Technical assistance, Training
	Provide training for persons involved in hazardous waste analysis	FEPA	MOA, UNEP, UNIDO,		×		Technical assistance, Resource mobilization
	Establish laboratory infrastructure for the analysis of hazardous wastes and other wastes	FEPA, R-EPA	UNEP, UNIDO	×	×		Technical assistance, infrastructure
	Promote the use of best practice to avoid or minimize the generation of hazardous waste, such as the use of clean methods;	FEPA, R-EPA	UNEP, UNIDO, ECPC	×	×		Technology, resource mobilization
	Develop practical guidelines for the establishment of an adequate standard of technology and pollution control to dispose of the hazardous waste	FEPA, R-EPA	UNEP, UNIDO, ECPC	×	×		Technical assistance, Training
	Provide training for Persons involved in the disposal of hazardous wastes	FEPA	UNEP, UNIDO, ECPC	×	×		Training, resource mobilization

Table Priority Activities to Manage... (continued)

	Adopt mechanisms for tracking down of illegal transport of hazardous substances	FEPA	Customs Authority	×	×	×	Training, infrastructure
	Support research and development projects on hazardous wastes	FEPA	Research Institutions, UNEP, UNIDO,		×		Resource mobilization
Reuse, recycle, treat and dispose municipal wastewater	Prepare standards and guidelines	FEPA, R-EPA	Municipalities		×	×	Technical assistance, Training
	Promote the establishment of onsite municipal wastewater treatment systems, reuse, and recycling	Municipalities, R-EPA	FEPA	×	×	×	Technical assistance, Training
	Implement urban storm-water run-off and drainage programmes			×	×		Technical assistance, Training
	Establish proper collection system	Municipalities		×	×	×	Technical assistance, Training
	Identify and implement appropriate wastewater treatment technologies	Municipalities		×	×		Technical assistance, Training
	Establish monitoring system	R-EPA		×	×	×	Technical assistance, Training

Table Priority activities and responsible stakeholders to “Management of Adverse Impact of Municipal Waste”

	Priority activities ³¹	Region/Institute											Federal Institutions				
		AA	DP A	H	Afa r	Amh ara	Ben. & Gumuz	Gam bella	Oro miya	Soma li	SNN	Tigray	EP A	MOH	MO TI	MOF	MoW R
Segregate, store, reuse or recycle and dispose 70 percent of municipal solid wastes emanating from residential houses																	
	Establish national solid waste management policy												X				
	Preparation of solid waste management plan	X	X	X	X	X	X	X	X	X	X	X					
	Ensure that regional administrations and city administrations implement solid waste management plan												X				
	Promote composting of yard wastes and/or food wastes and Construction of large scale composting	X	X	X	X	X	X	X	X	X	X	X					

³¹ Priority activities include all activities that will be undertaken at both Federal and Regional levels. During the project preparation period Activities to be undertaken at federal and regional levels will be categorized.

Table Priority activities and responsible ... (continued)

Promote the construction of small scale biogas production systems	X	X	X	X	X	X	X	X	X	X	X	X					
Estimation of residential waste generation rate	X	X	X	X	X	X	X	X	X	X	X	X					
Establish efficient mechanisms for segregation of waste at Source	X	X	X	X	X	X	X	X	X	X	X	X					
Define the types of containers for storage	X	X	X	X	X	X	X	X	X	X	X	X					
Design and implement systematic collection strategy for disposables and recyclables	X	X	X	X	X	X	X	X	X	X	X	X					
Equip all major streets, public centers, governmental offices and recreational areas with labeled litterbins	X	X	X	X	X	X	X	X	X	X	X	X					

Table Priority activities and responsible ... (continued)

	Prepare guidelines for collection, transport and disposal in sanitary landfill												X	X			
Manufacture containers and wrappers from recyclable or biodegradable materials																	
	Establish incentive mechanisms for packaging industry												X		X		
	Preparation of preferred packaging guidelines (No packaging; Minimal packaging; Consumable, returnable or reusable packaging; and Recyclable packaging or recycled material packaging)												X				

Table Priority activities and responsible ... (continued)

Modifications to package design (Manufacture of refillable bottles, Manufacture of reusable packaging, Manufacture of biodegradable plastics)													X		X		
Introduce eco-labeling mechanisms to distinguish environmentally preferred packages													X				
Recyclable cans and glass bottles taken back by the concerned manufacturers, reused, recycled or disposed of																	
Formulate regulation on manufacturers responsibility													X				
Establish local recycling centers	X	X	X	X	X	X	X	X	X	X	X	X					
Strengthen the existing recycling systems for reuse of beverage bottles	X	X	X	X	X	X	X	X	X	X	X	X					
Facilitate the take back of damaged bottles and cans for recycling by the manufacturers	X	X	X	X	X	X	X	X	X	X	X	X					

Table Priority activities and responsible ... (continued)

Develop strategy to control the import and/or reuse and recycle imported bottles and cans													X		X		
Recyclable plastic containers taken back by the concerned manufacturers, reused, recycled or disposed of																	
Review of the likely ways by which plastics are used and reused in Ethiopia													X				
Establish regulation for manufacturers and consumers responsibility													X		X		
Establish local plastic recycling centers	X	X	X	X	X	X	X	X	X	X	X	X					
Facilitate the establishment of plastic process scrap recycling system (primary waste)													X				

Table Priority activities and responsible ... (continued)

Establish post-use plastic recycling system (Commercial waste, agricultural waste, municipal waste)													X				
Facilitate the establishment of biodegradable plastics manufacturing system													X		X		
Develop strategy to control on import and/or to recycle, reuse and dispose imported plastic containers													X		X		
Use of refillable printer inks by government offices																	
Policy for purchase of printer inks													X			X	
Promote import of refillable printer inks													X		X		

Table Priority activities and responsible ... (continued)

	Set systems for collection and refilling by reputable supplier that will guarantee quality and reliability												X				
Use of recycled paper by government offices																	
	Policy for purchase of papers and equipments that minimize paper waste generation that can use recycled papers such as photocopiers, fax machines, and printers												X			X	
	Guidelines for usage of office papers												X				
	Guidelines for collection of used papers from offices												X				

Table Priority activities and responsible ... (continued)

Promote the replacement of imported pulp by recycled paper in paper and pulp industries													X		X		
Use of recyclable plastics by government and non government offices																	
Policy for purchase of recyclable plastics (Polyethylene (PE), Polypropylene (PP), Polystyrene (PS), Polyvinyl chloride (PVC))													X			X	
Collection, treatment and safe disposal of Medical wastes																	
Waste handling and disposal policy formulation for health care facilities													X	X			
Estimation of the type and amount of medical waste generated in different facilities	X	X	X	X	X	X	X	X	X	X	X	X					
Preparation of national plan for healthcare waste management													X	X			

Table Priority activities and responsible ... (continued)

Prepare guidelines for the proper handling and transportation of infectious medical waste and non-infectious medical waste in each health care facility													X	X			
Incineration of infectious waste in an improved incineration facility (centralized) or a dedicated small incinerator and disposal of ashes	X	X	X	X	X	X	X	X	X	X	X	X					
Establish monitoring system to control the performance of the incinerators in accordance with the environmental requirements	X	X	X	X	X	X	X	X	X	X	X	X	X				

Table Priority activities and responsible ... (continued)

Obligatory use of construction debris for refilling of excavated or quarry by construction agencies																
Formulate regulation for construction and demolition debris management													X			
Establish system to separate construction and demolition debris into recyclable and non-recyclable materials	X	X	X	X	X	X	X	X	X	X	X	X				
Define inert debris (as concrete, brick, concrete block, uncontaminated soil, rock and gravel) for recycling and reused as clean fill material													X			
Establish efficient system for collection and disposal of non-inert materials	X	X	X	X	X	X	X	X	X	X	X	X				

Table Priority activities and responsible ... (continued)

Upgrading of existing waste disposal sites to acceptable level and establishment of municipal solid waste landfill sites																
Formulate regulation for the design and management of municipal solid waste landfill operation													X			
Prepare EIA guidelines and set as a requirement													X			
Preparation of technical requirements for the construction of sanitary land fill systems													X			
Construction of landfill systems in regional and zone towns and cities	X	X	X	X	X	X	X	X	X	X	X	X				
Preparation of guidelines for the proper operation of landfills	X	X	X	X	X	X	X	X	X	X	X	X				

Table Priority activities and responsible ... (continued)

	Preparation of guidelines for monitoring requirements for Landfills during operation and after closure	X	X	X	X	X	X	X	X	X	X	X					
Utilization of used tires and oils as energy source for cement and other industries																	
	Quantitative estimation of waste oil generation in different cities and towns	X	X	X	X	X	X	X	X	X	X	X					
	Facilitate the establishment of local waste oil collection centers	X	X	X	X	X	X	X	X	X	X	X					
	Facilitate the establishment of regional waste oil collection centers	X	X	X	X	X	X	X	X	X	X	X					
	Facilitate the establishment of the necessary installations at the cement plants												X		X		
	Quantitative estimation of scrap tires and rubber in different cities and towns	X	X	X	X	X	X	X	X	X	X	X					

Table Priority activities and responsible ... (continued)

	Facilitate the establishment of local municipal collection centers	X	X	X	X	X	X	X	X	X	X	X					
	Establish onsite storage at cement plant																
	Equip an existing cement kiln with a technical system for processing and incineration of scrap tires and abandoned rubber												X		X		
Private enterprises engage in producing commodities minimize waste generation																	
	Promote voluntary implementation of environmental management system such the ISO 1400 series of standards	X	X	X	X	X	X	X	X	X	X	X	X				
	Estimation of waste generation rate from private enterprises	X	X	X	X	X	X	X	X	X	X	X					
	Establish efficient mechanisms for segregation of waste at Source	X	X	X	X	X	X	X	X	X	X	X					

Table Priority activities and responsible ... (continued)

Define the types of containers and the duration for storage	X	X	X	X	X	X	X	X	X	X	X	X	X				
Define reasonable amount of money the enterprises should pay for the management of unavoidable waste	X	X	X	X	X	X	X	X	X	X	X	X	X				
Design systematic collection strategy for disposable and recyclables wastes	X	X	X	X	X	X	X	X	X	X	X	X					
Equip all enterprises with containers for disposable and recyclable wastes	X	X	X	X	X	X	X	X	X	X	X	X					
Prepare guidelines for collection, transport and final disposal in sanitary landfill	X	X	X	X	X	X	X	X	X	X	X	X	X				
Support the private enterprises by providing information and technical assistance	X	X	X	X	X	X	X	X	X	X	X	X	X				

Table Priority activities and responsible ... (continued)

Manage the future impact of hazardous waste																
Establish a regulatory infrastructure and enforcement that ensures compliance with applicable regulations; transport control/checks/inspections;													X			
Establish registration procedures and prepare national hazardous waste management plan													X			
Conduct inventory on the generation of wastes specified in the Annex of the Basel and Bamako Conventions, and formulate national definition of hazardous waste	X	X	X	X	X	X	X	X	X	X	X	X				

Table Priority activities and responsible ... (continued)

Develop practical guidelines for sampling liquid and solid hazardous wastes and analysis													X				
Provide training for persons involved in hazardous waste analysis													X				
Establish laboratory infrastructure for the analysis of hazardous wastes and other wastes	X	X	X	X	X	X	X	X	X	X	X	X	X				
Promote the use of best practice to avoid or minimize the generation of hazardous waste, such as the use of clean methods;	X	X	X	X	X	X	X	X	X	X	X	X	X				

Table Priority activities and responsible ... (continued)

Develop practical guidelines for the establishment of an adequate standard of technology and pollution control to dispose of the hazardous waste													X				
Provide training for Persons involved in the disposal of hazardous wastes													X				
Adopt mechanisms for tracking down of illegal transport of hazardous substances													X				
Support research and development projects on hazardous wastes													X				

Table Priority activities and responsible ... (continued)

Reuse, recycle, treat and dispose municipal wastewater																	
	Prepare standards and guidelines	X	X	X	X	X	X	X	X	X	X	X	X				
	Promote the establishment of onsite municipal wastewater treatment systems, reuse, and recycling	X	X	X	X	X	X	X	X	X	X	X	X				
	Implement urban storm-water run-off and drainage programmes	X	X	X	X	X	X	X	X	X	X	X	X				X
	Establish proper collection system	X	X	X	X	X	X	X	X	X	X	X					
	Identify and implement appropriate wastewater treatment technologies	X	X	X	X	X	X	X	X	X	X	X	X				X
	Establish monitoring system	X	X	X	X	X	X	X	X	X	X	X	X				

5.6 Action Plan for Prevention of Environmental Pollution

Basis for Action

The Environmental Pollution Control Proclamation of Ethiopia provides a comprehensive legislative framework for the control of environmental pollution. The proclamation incorporates provisions on pollution control, environmental quality standard setting, inspection and monitoring, and liabilities.

The number of industries is increasing whereas the system to control the release of pollutants in to the environment is not in place. The agriculture sector is also expanding with the aim to fulfill self-food sufficiency and to export agricultural products to foreign markets. This may increase pollution of water and soil by pesticides and nutrients. The development of alternative energy resources is increasing with emphasis on hydropower generation, which may affect the natural eco-system and the human environment. The transportation sector depends on inefficient vehicles that release considerable amount of pollutants in to the air, which may have impact on human health, materials, and the environment at large. It is considered that vehicular emission is the major source of air pollution in urban centers in Ethiopia. The effects of pollution caused by use of leaded gasoline, use of older vehicles and lack of emissions control technology has been compounded by the historical absence of vehicle emissions legislation and inspection system.

All these activities are directly or indirectly contribute to the pollution of surface water (rivers, lakes) and groundwater. There are 12 major river basins and about 11 lakes in Ethiopia. The perennial flow river basins are: Nile, Awash, Baro-Akobo, Omo-Ghibe, Genale-Dawa, Wabi-Shebele, Mareb, and Tekeze. These rivers receive water from various tributaries within the drainage basin and passing through different regions. Several master plan studies are documented by the Ministry of Water Resources, which is mainly focusing on the water resource potential of the major river basins. Most of the 11 Ethiopian lakes are also vulnerable to pollution due to increasing agricultural activities, urbanization and industrialization. Groundwater may also be polluted in some parts of Ethiopia. However, the impact of human activities on the water quality has not been considered in all development projects.

In the past, significant amount of persistent organic pollutants such as Pesticides and PCBs were used and there are stockpiles of obsolete substances that must be disposed of in environmentally sound manner and sites that are contaminated with these substances which may require clean up in accordance with the Stockholm Convention. Further more, devices that use ozone layer depleting substances have been used in Ethiopia and a system to phase out and/or freeze the use of ODS has to be in place in accordance with Vienna Convention and Montreal Protocol.

In general the planning and implementation of environmental pollution control program requires considerable upgrading of the present capacities in terms minimum infrastructure and staff to identify and implement technical solutions and to enforce regulatory action. The capacity need is in the area of management, infrastructure, and technical competence of the regulatory bodies and the executing institutions. A comprehensive Human Resources Development Plan suitable to strengthen awareness, knowledge and skills is needed for producing the targeted results as well as for effective use of results. Supportive research and special investigations with the objective to promote and support effective result use would be important.

The following prominent principles form the basis of environmental pollution control strategies and practices:

The management of environmental quality must be carried out in an integrated and holistic manner, acknowledging that all elements of the environment are interrelated.

Self-regulatory management principle applies, in which the ISO 14000 series of environmental standards provides a range of self-regulatory management instruments, which can be utilized by industry to improve their environmental performance and competitiveness in global as well as local markets.

Decision-making must ensure that the best practicable environmental option is adopted by taking account of all aspects of the environment including all the people in the environment.

The precautionary approach applies, in which active measures are taken to avert or minimize potential risk of undesirable impacts on the environment.

In general the principle of Polluter Pays, applies. In accordance with this principle, the cost of remedying pollution, degradation of resource quality and consequent adverse health effects, and of preventing, minimizing or controlling pollution, is the responsibility of the polluter.

Participative management in the management of environment must be advocated, ensuring that all interested and affected parties have an equal opportunity to participate. The responsibilities of stakeholders have to be identified.

Transparency and openness must underlie all decision-making processes, and all information must be made accessible in accordance with the Constitution of Ethiopia and the Environmental Policy of Ethiopia.

A. Objectives:

A1. Overall Objective:

The overall objective is to prevent environmental pollution as an undesirable ethical, social and economic consequence of unsustainable agricultural and industrial production and consumption, energy development, and transportation activities.

A2. Specific Objectives:

To identify priority activities and capacity needs to establish environmental pollution prevention and control mechanisms in Ethiopia

To identify priority activities and capacity needs to address issues related to global environmental changes

To identify priority activities and capacity needs to establish sustainable environmental pollution monitoring system in Ethiopia

To identify priority activities and capacity needs for the implementation of appropriate technologies for the treatment and disposal of emissions from industries and other sources, and for the remediation of contaminated sites

Strengthen national capacity to develop and manage environmental information system

Three-Phase Approach

Environmental pollution control requires formulation of regulatory framework at the national level and management plan at both national and regional levels with strong emphasis on pollution prevention as a guiding principle. It is envisaged that the framework should be based on an integrated pollution prevention and control (IPPC) approach. Pollution prevention practices can be applied to all pollution-generating activities, including those found in the energy, agriculture, consumer, as well as industrial sectors taking in to account the cost and economic implications of the prevention and control measures.

The deterioration of surface water bodies, impairment of wetlands, ground water sources, and other critical resources constitutes pollution, and prevention practices may be essential for preserving these resources. These practices may include sustainable utilization of natural resources, conservation techniques, protection of human health, changes in management practices to prevent harm to sensitive ecosystems, and implementation of cleaner production technologies. On the other hand, end-of-pipe control approaches is applicable if the release of the substance of concern exceeds the specified level after taking all preventive measures.

Ensuring the effectiveness of pollution prevention and control programs requires a proper institutional and legal framework and adequate access to reliable information, trained human resources, and appropriate technologies. The proposed measures should be shared and consulted with environmentally aware stakeholders and the involved community and stimulated with adequate economic mechanisms. Internationally recommended actions and initiatives strongly address the need to implement pollution prevention and reduction programs for the prevention and control of environmental degradation caused by pollution. Thus pollution prevention and source reduction programs for agriculture, energy, mining, transportation and industrial and urban activities need to be launched or improved, within the scope of national strategies. These should include actions to reduce risks to human health and the environment posed by pollution from chemicals and toxic substances that persist in the environment.

The amount and type of pollutant generation is strongly linked to population growth and human activities. The strength of pollutant releasing sources and the capacity of the receiving environment to attenuate and/or disperse pollutants are also important. Further more, pollutant generated in one region may affect the environmental system in another region and even may contribute to the global environmental changes. This further justifies the need to establish national pollution monitoring system, which create strong ground to establish national database and also supports the process of international cooperation. The 10-year plan is designed in an integrated manner while placing strong emphasis on building capacity at the federal, regional, and zonal levels. The activities would include regulatory measures, economic incentives and streamlining of administrative procedures to assure maximum efficiency in dealing with applications for approval in order to facilitate investment decisions, advice and assistance with information, infrastructure support and stewardship responsibilities.

The three-phased approach proposed to environmental pollution control is:

Phase 1: Preparation of regulatory framework, policies, environmental quality standards and effluent standards, arrangement of institutional set up at different levels, preparation of environmental pollution control plan, preparation of manuals, and training of trainers

Phase 2: Select demonstration projects for activities under each strategic goal area on the basis of prioritization. Suggested demonstration projects are:

Phase 3: Implementation of all the activities by the federal, regional and zonal cities/towns

Table: Summary of the target levels to Prevent Environmental Pollution to be achieved in 10 Years

Strategic Goal	Target Level	Remarks
Existing industrial enterprises develop environmental management systems, EMS, to comply with pollution control laws	70 %	All regions
Existing commercial agricultural enterprises develop EMSs, to enable proper functioning of farm surrounding ecosystems and to protect human health	70 %	All Regions
Existing hydropower enterprises develop their environmental management systems ...	100 %	
Protection of targeted river basins and lakes/reservoirs from point and non-point source physico-chemical and microbial pollution	50 %	Rivers
	50 %	Lakes
Incorporate environmentally sustainable transportation system into urban and regional planning	50 %	
Phase out the consumption of ozone depleting substances and use of ozone depleting substances-based equipment	100 %	
Establish environmentally sound management of industrial wastes and develop disposal facilities in each industry	70 %	
Clean up all sites contaminated by persistent organic pollutants by	50 %	
Establish national environmental pollution monitoring programs		

Table Priority Activities for Environmental Pollution Control

No.	Strategic Goal	Priority activities	Remark
1	Encourage the establishment and operations of sustainably managed industrial production systems in Ethiopia	<p>Generate baseline data on the status of industrial pollution in Ethiopia</p> <p>Undertaking material and energy audit in selected industrial sectors</p> <p>Develop and implement appropriate environmental management tool such as ISO 14001 for establishing EMS by individual industries</p> <p>Assist industries in establishing cleaner production technologies</p> <p>Technique renovations</p> <p>Energy saving and raw material reduction</p> <p>Material substitution</p> <p>Water saving and recycling</p> <p>Provide training on sustainable production to managers and experts from industries</p> <p>Strengthen the capacity of existing laboratories and establish monitoring programs</p> <p>Implement system for data collection and reporting by individual industries about their discharge to the environment</p> <p>Establish system for inspection</p> <p>Promote environmental education and awareness on sustainable industrial production and consumption</p> <p>Implement the polluter-pays principle</p> <p>Licensing</p> <p>Cleaner production option</p> <p>System of waste discharge charges</p> <p>Remediation cost</p>	Link: Pollution Proclamation, Provisional environmental standards; Basel and Bamako Conventions, ISO 14001, QSAE standards , Agenda 21, Chapter 30 & Chapter 18, UNIDO

Table Priority Activities for ... (continued)

2	Existing commercial agricultural enterprises develop their environmental management systems to enable proper functioning of farm surrounding ecosystems and to protect human health	<p>Identification and application of best environmental practices at reasonable cost to avoid diffuse pollution, namely, through a limited, rational and planned use of nitrogenous fertilizers and other agrochemicals (pesticides, herbicides) in agricultural practices; use of buffer zones etc.</p> <p>Promote the implementation of Best Agricultural Practices and Management Systems by individual enterprises</p> <p>Prepare training manual on Best Agricultural Practices and Management Systems at a national level</p> <p>Conduct training of trainers for Regional experts</p> <p>Strengthen the capacity existing of laboratories and establish monitoring system</p> <p>Promote environmental education and awareness on environmental pollution by agro-chemicals and on the need of best agricultural practices</p> <p>Establish strategic partnerships with GOs and CBOs working on agricultural development and capacity building;</p> <p>Establish a monitoring system to ascertain the allocation and utilization of allocated funds</p>	<p>Link: ISO 14001; Rotterdam and Stockholm Conventions, pollution control Proclamation, Provisional Environmental Standards, Agenda 21, Chapter 18, Global Water Quality Monitoring Programme (GEMS/WATER), UNEP Environmentally Sound Management of Inland Waters (EMINWA), FAO regional inland fishery bodies, Ramsar Convention</p>
3	Existing hydropower enterprises develop their environmental management systems to enhance the proper functioning of aquatic and terrestrial ecosystems and to protect human health	<p>Generate baseline data on the impact and/or potential impact of hydropower plants on the aquatic and terrestrial ecosystems, and on the water quality</p> <p>Implement rehabilitation program for damaged ecosystems</p> <p>Establishment of mandatory environmental impact assessment of all hydropower development projects potentially impairing water quality and aquatic ecosystems</p> <p>Establish system for new hydropower plants to undergo through strict EIA process</p> <p>Prepare EMS training manual at a national level</p> <p>Conduct training of EMS trainers for projects</p> <p>Establish strategic partnerships with GOs and NGOs on the rehabilitation program</p> <p>Provide technical support in helping hydropower projects identify to build up their capacity</p> <p>Establish a monitoring system to ascertain the allocation and utilization of allocated funds</p>	<p>Link: ISO 14001, Pollution control Proclamation, Provisional Environmental Standards, Agenda 21, Chapter 18, Global Water Quality Monitoring Programme (GEMS/WATER), UNEP Environmentally Sound Management of Inland Waters (EMINWA), FAO regional inland fishery bodies, Ramsar Convention, Agenda 21, Chapter 18</p>

Table Priority Activities for ... (continued)

4	Protection of targeted river basins from point and non-point source physico-chemical and microbial pollution	<p>Categorize rivers and lakes based on their potential use</p> <p>Establish biological, health, physical and chemical quality criteria for all water bodies (surface and groundwater) based on use categories</p> <p>Establishment of standards for the discharge of effluents and for the receiving waters;</p> <p>Generate baseline data on the release and possible release of organic pollutants, trace metals and nutrients to the water and soil environment</p> <p>Initiate effective water pollution prevention and control programmes, based on an appropriate mixture of pollution reduction-at-source strategies, environmental impact assessments and enforceable standards for major point-source discharges and high-risk non-point sources, commensurate with their socio-economic development;</p> <p>Establish river, lake, and groundwater quality monitoring network in targeted basins</p> <p>Rehabilitation of polluted and degraded water bodies within the targeted basins to restore aquatic habitats and ecosystems;</p> <p>Control of noxious aquatic species that may destroy some other water species</p> <p>Promote research on point and non-point source pollution</p> <p>Establish strategic partnerships with GOs, NGOs and CBOs working on development projects in targeted river basins</p> <p>Conduct training of experts from regions and other relevant organizations</p>	<p>Link: Pollution control Proclamation, Provisional Environmental Standards, Agenda 21, Chapter 18, Global Water Quality Monitoring Programme (GEMS/WATER), UNEP Environmentally Sound Management of Inland Waters (EMINWA), FAO regional inland fishery bodies, Ramsar Convention</p>
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Table Priority Activities for ... (continued)

5	Incorporate environmentally sustainable transportation system into urban and regional planning	<p>Establish air quality standards and guidelines</p> <p>Develop and implement Compliance of vehicles to be imported with the emission standard</p> <p>Prepare plan and implement vehicle emission inspection and monitoring program</p> <p>Prepare plan to phase out existing polluting vehicles</p> <p>Promote awareness creation program on issues related to sustainable transportation</p> <p>Promote mass transportation concept into public transportation system</p> <p>Facilitate the expansion of public transportation by means of non-motorized vehicles in selected urban centers</p> <p>Establish strategic partnerships with GOs, NGOs and CBOs working on transportation related activities</p> <p>Provide technical training to experts from the regions on air pollution monitoring and control mechanisms</p>	<p>Link: Pollution control laws and related emission standards , Johannesburg Summit</p>
6	Phase out the consumption of ozone depleting substances and use of ozone depleting substances-based equipment according to the Vienna convention and its Montreal protocols and amendments	<p>Conduct the inventory of ozone depleting substances (ODSs) based equipments in Ethiopia and prepare classification</p> <p>Prepare national implementation plan to freeze and phase out ODSs in accordance with Vienna Convention and Montreal Protocol</p> <p>Formulate regulation to control the import of equipments containing ODSs and their substitutes</p> <p>Provide training to experts from regions on monitoring and control of ODSs and their substitutes</p> <p>Adopt approaches to reduce and eventually phase out the consumption of ODS such as:</p> <p>Prohibit the import and manufacture of non-pharmaceutical aerosol products and polystyrene sheets/products containing controlled CFCs.</p> <p>Prohibit the use of Halon 1301 for new fire protection systems.</p> <p>Prohibit the import of Halon 2402.</p> <p>Prohibit the import of Halon 1211 and Halon 1301.</p> <p>Prohibit the import of new air-conditioning and refrigeration equipment using CFC 11 and CFC 12.</p> <p>Prohibit the import of fire-extinguishers filled with Halon 1211.</p> <p>All new cars must be equipped with non-CFC air-conditioning systems.</p> <p>Prohibit the import of HBFCs.</p> <p>Prohibit the import of CFCs, carbon tetrachloride and 1,1,1-trichloroethane (Methyl chloroform).</p> <p>Promote research on ODSs and their substitutes</p>	<p>Vienna Convention and Montreal Protocol and the amendments</p>

Table Priority Activities for ... (continued)

7	Establish environmentally sound management of industrial wastes and develop disposal facilities in each industrial zone	<p>Promote industrial firms' efforts to make their operations and systems environmental friendly and ecologically sound</p> <p>Promote the principles of waste reduction, reuse, and recycling by individual industries</p> <p>Formulate and enforce emission guidelines and standards taking into account local environmental conditions</p> <p>Adopt and standardize best available techniques and practices to control pollution</p> <p>Assist industries in establishing end-of-pipe pollution control devices whenever needed</p> <p>Implement R&D programs to promote sustainable industrial development in the area of effective utilization of energy, development and commercialization of recycling systems, development low cost and efficient waste treatment and/or recovery technologies etc.</p> <p>Implement "polluter pays" for industries that discharge waste without any consideration of the receiving environment</p> <p>Provide training to experts from industries on environmentally sound management of waste</p> <p>Establish information system</p>	Link: ISO 14001, Environmental Pollution Law; Basel and Bamako Conventions
8	Clean up all sites contaminated by persistent organic pollutants	<p>Identify all stockpiles and all sites contaminated by POPs and related pesticides</p> <p>Identify appropriate disposal and remediation methods</p> <p>Secure financial resources for disposal and remediation</p> <p>Provide training on remediation and disposal technologies</p> <p>Establish monitoring system after clean up</p> <p>Promote research and development on appropriate disposal and remediation technologies</p>	Link: Stockholm and Rotterdam Conventions
9	Establish national environmental pollution monitoring and surveillance programs	<p>Institutional set up for pollution monitoring</p> <p>Formulate pollution monitoring plan at national and regional levels</p> <p>Strengthen and/or establish national and regional laboratories for environmental analysis</p> <p>Establish water pollution monitoring program</p> <p>Establish air pollution monitoring program and stations</p> <p>Establish database and information documentation system</p> <p>Establish international and regional network for information exchange</p> <p>Establish reporting system</p>	

Table Prioritization Matrix for Environmental Pollution Prevention

Strategic Goal	Scale Problem ¹	Level of Concern ²	Ability to adequately address the Issue ²	Priority Ranking ³
Establish environmentally sustainable industrial production systems in Ethiopia	National	High	Medium	1
Existing commercial agricultural enterprises develop their environmental management systems, EMSs, to enable proper functioning of farm surrounding ecosystems and to protect human health	National	High	Medium	1
Existing hydropower enterprises develop their environmental management systems to enhance the proper functioning of aquatic and terrestrial ecosystems and to protect of human health	National	High	Medium	2
Protection of targeted river basins from point and non-point source physico-chemical and microbial pollution	Regional	Medium	Medium	2
Incorporate of environmentally sustainable transportation system into urban and regional planning	National	Medium	Medium	3
Phase out the consumption of ozone depleting substances and use of ozone depleting substances-based equipment according to the Vienna convention and its protocols and amendments	National /Regional	Medium	Medium	3
Establish environmentally sound management of industrial wastes and develop disposal facilities in each industrial zone	National/R regional	High	Low	1
Clean up all sites contaminated by persistent organic pollutants	National	High	Low	3
Establish national environmental pollution monitoring programs	National	High	Low	1

1= Local, National, or Regional

2= Low, Medium, or High

3= Relative Ranking from 1 to 5, where 1 is the most severe problem, 5 is the least severe problem.

Table.... Priority Activities, Stakeholders and Capacity Building Inputs for Environmental Pollution Prevention

Strategic Goals	Priority Activities	Stakeholder		Capacity level			Capacity building input
		Focal Institution	Other stakeholders	Individual	Institutional	Systemic	
Existing industrial enterprises develop environmental management systems, EMS, to comply with pollution control laws	Generate baseline data on the status of industrial pollution in Ethiopia	FEPA, R-EPA	AWSSA, MOWR, Industries, Research laboratories	X	X		Consultancy; Technical assistance
	Develop and implement appropriate environmental management tool such as ISO 14001 for establishing EMS by individual industries	QSAE, ECPC	FEPA, R-EPA MOTI	X	X		Technical assistance
	Assist industries in establishing cleaner production technologies	FEPA, R-EPA	ECPC	X	X	X	Technical, Consultancy, Fund
	Provide training to managers and experts from industries	FEPA	UNEP, UNIDO, ECPC	X	X		Consultancy; Technical assistance
	Strengthen the capacity of existing laboratories and establish monitoring programs	FEPA, R-EPA	AWSSA, MOWR	X	X		Technical assistance, infrastructure
	Promote environmental education and awareness on sustainable industrial development	FEPA, R-EPA	CBOs, NGO	X	X		Technical assistance

Table.... Priority Activities, Stakeholders ... (continued)

	Implement the polluter-pays principle described in principle 16 of the Rio Declaration on Environment and Development	FEPA, R-EPA	MOTI			X	Resource mobilisation
Existing commercial agricultural enterprises develop EMSs, to enable proper functioning of farm surrounding ecosystems and to protect human health	Identification and application of best environmental practices at reasonable cost to avoid diffuse pollution, namely, through a limited, rational and planned use of nitrogenous fertilizers and other agrochemicals (pesticides, herbicides) in agricultural practices;	MOARD, FEPA, R-EPA	Agro-enterprises, ECPC, MOWR	X	X	X	Consultancy; Technical assistance
	Prepare EMS training manual at a national level	MOARD, FEPA	R-EPA, Individual agro-enterprises, ECPC, QSAE	X	X		Consultancy
	Conduct training of EMS trainers for Regional experts	MOARD, FEPA	Agro-enterprises, ECPC, MOARD, R-EPA, QSAE	X	X		Consultancy

Table.... Priority Activities, Stakeholders ... (continued)

	Strengthen capacity existing of laboratories and establish monitoring system	MOARD, FEPA, R-EPA	Public and private laboratories, MOWR,	X	X	X	Consultancy; Technical assistance, infrastructure
	Adopt/adapt environmental technologies and best practices	MOARD, FEPA	R-EPAs, ESTC, Public & private enterprises, CBOs, NGO	X	X		Local & external technical assistance; technology
	Promote environmental education and awareness	FEPA	ECPC, R- EPAs, ESTC, , CBOs, NGO	X	X		Technical assistance
	Establish strategic partnerships with GOs and CBOs working on EMSs capacity building	FEPA, R-EPA	MOARD, UNEP, UNIDO			X	
Existing hydropower enterprises develop their environmental management systems ...	Generate baseline data on the impact and/or potential impact of hydropower plants on the aquatic and terrestrial ecosystems, and on the water quality	FEPA, R-EPAs	EEPCO, MOME, ECPC, Private Enterprises	X	X		Consultancy; Technical assistance
	Implement rehabilitation program for damaged ecosystems			X	X	X	Technical assistance

Table.... Priority Activities, Stakeholders ... (continued)

	Establishment of mandatory environmental impact assessment of all hydropower development projects potentially impairing water quality and aquatic ecosystems	FEPA, R-EPA	MOWR	X	X	X	Technical assistance
	Prepare EMS training manual at a national level	FEPA, R-EPA	MOWR	X	X		Consultancy
	Conduct training of EMS trainers for EEPKO projects	FEPA, R-EPA	MOWR	X	X		Consultancy
	Establish strategic partnerships with GOs and NGOs on the rehabilitation program	FEPA	EEPKO, ECPC, GOs			X	
Protection of targeted river basins from point and non-point source physico-chemical and microbial pollution	Categorize rivers and lakes based on their potential use	FEPA, R-EPA,	MOWR	X	X		Technical assistance
	Establish biological, health, physical and chemical quality criteria for all water bodies (surface and groundwater) based on use categories	FEPA, R-EPA	MOWR	X	X		Consultancy, technical assistance

Table.... Priority Activities, Stakeholders ... (continued)

	Generate baseline data on the release and possible release of organic pollutants, trace metals and nutrients to the water and soil environment	FEPA, R-EPAs	EPA GOs, NGOs, CBOs, Community	X	X		Consultancy / Resource mobilization
	Establishment of standards for the discharge of effluents and for the receiving waters;	FEPA, R-EPA	MOWR	X	X		Consultancy
	Initiate effective water pollution prevention and control programmes, based on an appropriate mixture of pollution reduction-at-source strategies, environmental impact assessments and enforceable standards for major point-source discharges and high-risk non-point sources, commensurate with their socio-economic development;	FEPA, R-EPA	MOWR	X	X	X	Consultancy, Technical assistance, resource mobilization
	Rehabilitation of polluted and degraded water bodies within the targeted basins to restore aquatic habitats and ecosystems;	FEPA, R-EPA	MOWR	X	X	X	Technical assistance, resource mobilization

Table.... Priority Activities, Stakeholders ... (continued)

	Establish river, lake, and groundwater quality monitoring network in targeted basins	FEPA, R-EPA	MOWR	X	X	X	Resource mobilization
	Control of noxious aquatic species that may destroy some other water species	FEPA, R-EPA	MOWR	X	X	X	Resource mobilization
	Promote research on point and non-point source pollution	FEPA, MOWR	UNEP, UNIDO, Research institutions	X	X	X	Resource mobilization
	Establish strategic partnerships with GOs, NGOs and CBOs working on development projects in targeted river basins	FEPA, R-EPA	MOWR			X	
	Conduct training of experts from regions and other relevant organizations	FEPA, R-EPA	MOWR	X	X		Consultancy

Table.... Priority Activities, Stakeholders ... (continued)

Incorporate environmentally sustainable transportation system into urban and regional planning	Establish air quality standards and guidelines for selected primary and secondary air pollutants	FEPA, R-EPA	MOTC, FRTA R-RTA		X		Consultancy, Technical assistance
	Develop and implement system to control compliance of vehicles to be imported with the emission standard	FEPA, R-EPA	MOTC, FRTA R-RTA, Traffic Police, Customs Authority, Auto-importers,	X	X		Consultancy
	Prepare plan and implement vehicle emission monitoring program	FEPA, R-EPA	MOTC, FRTA R-RTA, Traffic Police, Customs Authority, Auto-importers		X		Consultancy, Technical assistance, infrastructure
	Prepare plan to phase out existing polluting vehicles	MOTC, FRTA R-RTA, Traffic Police,	FEPA, R-EPA Community	X	X		Resource mobilization
	Promote awareness creation program on issues related to sustainable transportation	FEPA, R-EPA, MOTC	Mass media			X	Resource mobilization

Table.... Priority Activities, Stakeholders ... (continued)

	Promote mass transportation concept into public transportation system	FEPA, R-EPA, MOTC	Traffic Police, Customs Authority, Auto-importers		X	X	
	Facilitate the expansion of public transportation by means of non-motorized vehicles in selected urban centers	MOTC, Municipalities	FEPA, R-EPA,		X	X	Resource mobilization
	Establish strategic partnerships with GOs, NGOs and CBOs working on transportation related activities	MOTC, Municipalities	FEPA, R-EPA,			X	
	Provide technical training to experts from the regions on air pollution monitoring and control mechanisms	FEPA	Higher Learning Institutions	X	X		Consultancy, Technical assistance

Table.... Priority Activities, Stakeholders ... (continued)

Phase out the consumption of ozone depleting substances and use of ozone depleting substances-based equipment	Conduct the inventory of ozone depleting substances (ODSs) based equipments in Ethiopia	NMSA, FEPA	R-EPA	X	X		Consultancy, Technical assistance
	Prepare national implementation plan to freeze and phase out ODSs in accordance with Vienna Convention and Montreal Protocol	NMSA	FEPA, R-EPA UNEP		X	X	Consultancy, Technical assistance
	Establish mechanisms to control the import of equipments containing ODSs and their substitutes	NMSA	FEPA, R-EPA		X	X	Resource mobilization
	Provide training to experts from regions on monitoring and control of ODSs and their substitutes	NMSA, FEPA	Higher Learning Institutions, UNEP		X		Consultancy, Technical assistance
	Promote research on ODSs and their substitutes	NMSA, FEPA	R-EPA, Higher Learning Institutions	X	X		Technical assistance

Table.... Priority Activities, Stakeholders ... (continued)

Establish environmentally sound management of industrial wastes and develop disposal facilities in each industrial zone	Promote industrial firms' efforts to make their operations and systems environmental friendly and ecologically sound	QSAE, FEPA, R-EPA	ECPC,, Public & Priv. enterprises , UNIDO			X	Consultancy, Technical assistance
	Formulate and enforce emission guidelines and standards taking into account local environmental conditions	FEPA, R-EPA	Industries	X	X	X	Consultancy, Technical assistance
	Promote the principles of waste reduction, reuse, and recycling by individual industries	FEPA, ECPC	R-EPA, UNIDO, UNEP		X	X	Technical assistance
	Adopt and standardize best available techniques and practices to control pollution	FEPA, ECPC	ECPC, R-EPA, UNIDO	X	X		Technical assistance, Resource mobilization
	Assist industries in establishing end-of-pipe pollution control devices whenever needed	FEPA	R-EPA, MOF		X	X	Technical assistance
	Implement “polluter pays” for industries that discharge waste without any consideration the receiving environment	FEPA, R-EPA	MOTI			X	Resource mobilization

Table.... Priority Activities, Stakeholders ... (continued)

	Provide training to experts from industries on environmentally sound management of waste	FEPA	ECPC, Higher Learning Institutions	X	X		Consultancy, Technical assistance
	Implement R&D programs to promote sustainable industrial development in the area of effective utilization of energy, development and commercialization of recycling systems, development low cost and efficient waste treatment and/or recovery technologies etc.	FEPA	ECPC, Higher Learning Institutions, UNEP, UNIDO	X	X		Consultancy, Technical assistance, Resource mobilization
	Establish information system	FEPA, R-EPA	Industries	X	X		Consultancy, Technical assistance, resource mobilization
Clean up all sites contaminated by persistent organic pollutants by	Identify all stockpiles and all suspect sites	FEPA, R-EPA, MOARD	UNEP, FAO	X	X		Consultancy, Technical assistance;
	Strengthen and/or establish national and regional laboratories for environmental analysis	FEPA, R-EPA	MOWR, MOARD	X	X		Consultancy, Technical assistance, resource mobilization

Table.... Priority Activities, Stakeholders ... (continued)

	Conduct initial testing and classify contaminated sites	FEPA, R-EPA	MOARD	X	X		Consultancy, Technical assistance,
	Develop remediation/Risk management strategy	FEPA, R-EPA	MOWR	X	X		Consultancy, Technical assistance,
	Implement methods remediation/Risk management methods	FEPA	MOARD UNEP, FAO	X	X		Consultancy, Technical assistance,
	Provide training on remediation and disposal technologies	FEPA	MOARD, Higher Learning Institutions, UNEP, FAO	X	X		Technical assistance, ,consultancy
	Establish monitoring system after clean up	FEPA, R-EPA	MOARD	X	X		Consultancy, Technical assistance; Resource mobilization
	Promote research and development on appropriate disposal and remediation technologies	FEPA	MOARD, Higher Learning Institutions, UNEP, FAO	X	X	X	Resource mobilization
Establish national environmental pollution monitoring programs	Formulate pollution monitoring plan at national and regional levels	FEPA, R-EPA	MOWR, MOARD		X	X	Consultancy, Technical assistance;
	Establish database and information documentation system	FEPA, R-EPA	MOWR, MOARD	X	X	X	Consultancy, Technical assistance; resource mobilization
	Establish international and regional network for information exchange	FEPA, R-EPA	MOWR, MOARD		X	X	
	Establish reporting system	FEPA, R-EPA	MOWR, MOARD		X	X	

Table....Concerned regional and federal institutions to perform the priority activities.

Priority Activities	Region/Institute											Federal Institutions				
	AA	Af ar	Amh ara	Ben. & Gumuz	DPA	Gamb ella	Oromi ya	Som ali	SN N	Tig ray	H NR S	EPA	MOW R	MO TI	NMS A	MO ARD
Existing industrial enterprises develop environmental management systems, EMS, to comply with pollution control laws																
Generate baseline data on the status of industrial pollution in Ethiopia	X	X	X	X	X	X	X	X	X	X	X	X				
Develop and implement appropriate environmental management tool such as ISO 14001 for establishing EMS by individual industries	X	X	X	X	X	X	X	X	X	X	X	X				
Assist industries in establishing cleaner production technologies	X	X	X	X	X	X	X	X	X	X	X			X		
Provide training to managers and experts from industries												X				

Table....Concerned regional and federal ... (continued)

Strengthen the capacity of existing laboratories and establish monitoring programs													X				
Promote environmental education and awareness on sustainable industrial development	X	X	X	X	X	X	X	X	X	X	X	X	X				
Establish strategic partnerships with GOs and CBOs working on EMSs capacity building;	X	X	X	X	X	X	X	X	X	X	X	X	X				
Existing commercial agricultural enterprises develop EMSs, to enable proper functioning of farm surrounding ecosystems and to protect human health																	
Implement Best Agricultural Practices and Management Systems for establishing EMS by individual enterprises	X	X	X	X	X	X	X	X	X	X	X	X	X				
Prepare EMS training manual at a national level													X				

Table....Concerned regional and federal ... (continued)

Conduct training of EMS trainers for Regional experts												X				
Strengthen capacity of existing laboratories and establish monitoring system	X	X	X	X	X	X	X	X	X	X	X	X				
Adopt/adapt environmental technologies and best practices	X	X	X	X	X	X	X	X	X	X	X	X				
Promote environmental education and awareness	X	X	X	X	X	X	X	X	X	X	X	X				
Establish strategic partnerships with GOs and CBOs working on EMSs capacity building	X	X	X	X	X	X	X	X	X	X	X	X				
Establish a monitoring system to ascertain the allocation and utilization of allocated fund												X				

Table....Concerned regional and federal ... (continued)

Existing hydropower enterprises develop their environmental management systems ...																
Generate baseline data on the impact and/or potential impact of hydropower plants on the aquatic and terrestrial ecosystems, and on the water quality	X	X	X	X	X	X	X	X	X	X	X	X				
Establish system for new hydropower plants to undergo through strict EIA process												X				
Conduct training of EMS trainers for EEPCO projects												X				
Establish strategic partnerships with GOs and NGOs on the rehabilitation program	X	X	X	X	X	X	X	X	X	X	X	X				

Table....Concerned regional and federal ... (continued)

Establish a monitoring system to ascertain the allocation and utilization of allocated funds													X				
Protection of targeted river basins from point and non-point source physico-chemical and microbial pollution³²																	
Categorize rivers and lakes based on their potential use	X	X	X	X	X	X	X	X	X	X	X	X	X				
Generate baseline data on the release and possible release of organic pollutants, trace metals and nutrients to the air, water and soil environment	X	X	X	X	X	X	X	X	X	X	X	X	X				
Identify and implement pollution prevention mechanisms	X	X	X	X	X	X	X	X	X	X	X	X	X				
Establish river, lake, and groundwater quality monitoring network in targeted basins	X	X	X	X	X	X	X	X	X	X	X	X	X				

³² FEPA will be the focal institution to undertake this activity in collaboration with the R-EPAs

Table....Concerned regional and federal ... (continued)

Promote research on point and non-point source pollution													X				
Establish strategic partnerships with GOs, NGOs and CBOs working on development projects in targeted river basins	X	X	X	X	X	X	X	X	X	X	X	X	X				
Conduct training of experts from regions and other relevant organizations													X				
Incorporate environmentally sustainable transportation system into urban and regional planning																	
Establish air quality standards and guidelines	X	X	X	X	X	X	X	X	X	X	X	X	X				
Develop and implement Compliance of vehicles to be imported with the emission standard													X				

Table....Concerned regional and federal ... (continued)

Prepare plan and implement vehicle emission monitoring program	X	X	X	X	X	X	X	X	X	X	X					
Prepare plan to phase out existing polluting vehicles	X	X	X	X	X	X	X	X	X	X	X	X				
Promote awareness creation program on issues related to sustainable transportation	X	X	X	X	X	X	X	X	X	X	X	X				
Promote mass transportation concept into public transportation system												X				
Facilitate the expansion of public transportation by means of non-motorized vehicles in selected urban centers	X	X	X	X	X	X	X	X	X	X	X					

Table....Concerned regional and federal ... (continued)

Establish strategic partnerships with GOs, NGOs and CBOs working on transportation related activities	X	X	X	X	X	X	X	X	X	X	X	X				
Provide technical training to experts from the regions on air pollution monitoring and control mechanisms												X				
Phase out the consumption of ozone depleting substances and use of ozone depleting substances-based equipment																
Conduct the inventory of ozone depleting substances (ODSs) based equipments in Ethiopia												X			X	
Prepare national implementation plan to freeze and phase out ODSs in accordance with Vienna Convention and Montreal Protocol												X			X	

Table....Concerned regional and federal ... (continued)

Establish mechanisms to control the import of equipments containing ODSs and their substitutes													X		X	X	
Provide training to experts from regions on monitoring and control of ODSs and their substitutes													X			X	
Promote research on ODSs and their substitutes													X			X	
Establish environmentally sound management of industrial wastes and develop disposal facilities in each industrial zone																	
Adopt/adapt environmental technologies and best practices for the different industries	X	X	X	X	X	X	X	X	X	X	X	X	X				
Formulate and enforce emission guidelines and standards taking into account local environmental conditions	X	X	X	X	X	X	X	X	X	X	X	X	X				

Table....Concerned regional and federal ... (continued)

Promote the principles of waste reduction, reuse, and recycling by individual industries	X	X	X	X	X	X	X	X	X	X	X	X				
Adopt and standardize best available techniques and practices to control pollution												X				
Assist industries in establishing end-of-pipe pollution control devices whenever needed	X	X	X	X	X	X	X	X	X	X	X	X				
Implement “polluter pays” for industries that discharge waste without any consideration the receiving environment	X	X	X	X	X	X	X	X	X	X	X	X				
Provide training to experts from industries on environmentally sound management of waste												X				

Table....Concerned regional and federal ... (continued)

Promote research and development on low cost and efficient waste treatment and/or recovery technologies													X				
Clean up all sites contaminated by persistent organic pollutants by																	
Identify all stockpiles and all sites contaminated by POPs and related pesticides	X	X	X	X	X	X	X	X	X	X	X	X					
Identify appropriate disposal and remediation methods	X	X	X	X	X	X	X	X	X	X	X	X	X				
Secure financial resources for disposal and remediation	X	X	X	X	X	X	X	X	X	X	X	X	X				
Provide training on remediation and disposal technologies													X				
Establish monitoring system after clean up	X	X	X	X	X	X	X	X	X	X	X	X	X				
Adopt/adapt environmental technologies and practices	X	X	X	X	X	X	X	X	X	X	X	X	X				

Table....Concerned regional and federal ... (continued)

Establish monitoring system after clean up	X	X	X	X	X	X	X	X	X	X	X	X				
Promote research and development on appropriate disposal and remediation technologies												X				
Establish national environmental pollution monitoring programs																
Formulate pollution monitoring plan at national and regional levels	X	X	X	X	X	X	X	X	X	X	X	X				
Strengthen and/or establish federal and regional laboratories for environmental analysis	X	X	X	X	X	X	X	X	X	X	X	X				
Establish database and information documentation system	X	X	X	X	X	X	X	X	X	X	X	X				
Establish international and regional network for information exchange												X				
Establish reporting system	X	X	X	X	X	X	X	X	X	X	X	X				

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
ENVIRONMENTAL PROTECTION AUTHORITY

National Capacity Needs Self-Assessment Action Plan

A Synthesis Report

(Final)

ADDIS ANTENEH
CONSULTANT/ECONOMIST
April 2006, Addis Ababa

TABLE OF CONTENTS

I. INTRODUCTION AND BACKGROUND.....	1
1.1. INTRODUCTION	1
1.2. OBJECTIVE	2
1.3. METHODOLOGY	2
1.4. THE FRAMEWORK AND PRINCIPLES OF THE NATIONAL CAPACITY NEEDS SELF-ASSESSMENT	4
ACTION PLAN.....	4
<i>1.4.1. The International Framework.....</i>	<i>4</i>
<i>1.4.2. The Country Framework.....</i>	<i>8</i>
1.5. UNDERLYING PRINCIPLES FOR PROPER IMPLEMENTATION OF NCNSA	10
1.6. STAKEHOLDERS FOR NCNA	14
1.7. IMPLEMENTATION MODALITIES.....	16
<i>1.7.1. Institutional Arrangement.....</i>	<i>16</i>
<i>1.7.2. Implementation approach.....</i>	<i>20</i>
1.8. ADDITIONAL MANDATE FOR EPA	20
1.9. RESOURCE MOBILIZATION	23
II. SUMMARY OF STOCKTAKING REPORT	25
2.1. INTERNATIONAL ENVIRONMENT AGREEMENTS.....	25
<i>2.1.1. The Convention on Biological Diversity.....</i>	<i>26</i>
<i>2.1.2. The United Nations Framework Convention on Climate Change</i>	<i>26</i>
<i>2.1.3. The United Nations Convention to Combat Desertification.....</i>	<i>26</i>
<i>2.1.4. The Convention on International Trade in Endangered Species.....</i>	<i>26</i>
<i>2.1.5. The Vienna Convention and the Montreal Protocol.....</i>	<i>26</i>
<i>2.1.6. The Basel Convention.....</i>	<i>27</i>
<i>2.1.7. The Rotterdam Convention on the Prior Informed Consent Procedure</i>	<i>27</i>
<i>2.1.8. The Stockholm Convention on Persistent Organic Pollutants.....</i>	<i>27</i>
2.2. THE POLICY AND LEGAL MEASURES OF ETHIOPIA	27
<i>2.2.1. Institutional Measures</i>	<i>28</i>
<i>2.2.2. Implementation status.....</i>	<i>28</i>
2.3. CAPACITY GAPS	30
III. SUMMARY OF CAPACITY NEEDS ASSESSMENT	31
3.1. MAINSTREAMING AND INSTITUTIONALIZING ENVIRONMENTAL ISSUES.....	32
3.2. COMMUNITY MANAGED ENVIRONMENTAL MANAGEMENT FOR IMPROVED LIVELIHOODS	34
3.3. REHABILITATION OF MAJOR ECOSYSTEMS OF ETHIOPIA.....	35
3.4. ENHANCING GOODS AND SERVICES OF THE ENVIRONMENT	36
3.5. MANAGING ADVERSE IMPACTS OF MUNICIPAL WASTE.....	37
3.6. PREVENTION OF ENVIRONMENTAL POLLUTION	38
IV. SUMMARY OF ACTION PLAN.....	41
4.1. MAINSTREAMING AND INSTITUTIONALIZING ENVIRONMENTAL ISSUES.....	42
4.2. COMMUNITY-LED ENVIRONMENTAL PROTECTION FOR IMPROVED LIVELIHOOD	45
4.3. REHABILITATION OF MAJOR ECOSYSTEMS IN ETHIOPIA.....	51
4.5. MANAGE THE ADVERSE IMPACT OF MUNICIPAL WASTE	57
4.6. PREVENTION OF ENVIRONMENTAL POLLUTION	59
V. MONITORING AND EVALUATING THE IMPLEMENTATION OF A NATIONAL STRATEGY/ACTION PLAN	61

I. INTRODUCTION AND BACKGROUND

1.1. Introduction

This consultancy service was undertaken pursuant to the contract agreement signed between the Environmental Protection Authority (EPA) and Addis Anteneh Consultant/Economist (AEC) on December 16, 2005¹. The EPA had earlier commissioned AEC (April 2005) to produce a stocktaking report; a capacity needs assessment report, and a capacity building action plan. AEC produced the three generic documents, which were discussed at a workshop organized to review and assess the findings, conclusions and recommendations. The client and all the other stakeholders from both the Federal and Regional institutions attending the workshop accepted the reports. The stocktaking report reviewed the existing situation in Ethiopia regarding the nature of the obligations and provisions specified in the international environmental conventions the country has acceded to or ratified. The Capacity Needs Assessment Report identified the capacity needs of the principal stakeholder institutions in order for them to be able to effectively implement and/or enforce the national obligations and to benefit from the provisions stipulated in the international environmental conventions and the related protocols. The Action Plan for Capacity Building was built on the findings of the capacity needs assessment and developed the details of the capacity building actions and activities required to meet the need identified earlier.

In addition to the work of the local consulting team, which has produced Stocktaking, Capacity Needs Assessment and Action Plan documents in a generic form, EPA Task Forces and Regional Agencies have been also trying to develop their own region-specific documents. These documents required further review and consolidation as well as integration into the National Capacity Needs Self-Assessment Action Plan.

The consulting team, which had acquired a more in-depth knowledge and insight of the project due to the earlier engagement, was commissioned to review and consolidate the various Regional Action Plans into a National Action Plan as a necessary extension of the previous service signed on April 12, 2005.

Taking into consideration the results from the three documents (stocktaking, capacity building and action plan of NCSA), are synthesized into this single concise document: “**Synthesis of the National Capacity Needs Self-Assessment**”. This document can serve, as an important tool to brief national decision-makers as well as external funding agencies about specific capacity needs to protect the national and global environment and thereby bringing a sustainable livelihood to Ethiopians.

The task focused on the assessment and identification of key and strategic capacity building requirements that will be implemented within the coming ten years (2006-2015) that are contributing towards the attainment of the agreed upon National Environmental Strategic Goals.

¹ AEC’s team consists of: Dr. Belay Simane, Team Leader and Agronomist and Environment Resource Management Expert, Professor Zerihun Woldu, Ecologist/Environmental Management Expert Dr. Feleke Zewge, Environmental Chemist, and Ato Addis Anteneh, Economist and Advisor to the Team.

1.2. Objective

The primary objective of the service was to undertake a systematic review of the capacity needs assessment action plans prepared by the Regional States and EPA Task Forces and consolidate them into a national action plan that would reflect both federal and regional level interests, and facilitate cost effectiveness in the attainment of the strategic goals built around the thematic areas.

1.3. Methodology

The consulting team members have made an extensive documentation review of relevant published and unpublished reports and data available in written form. The lists of documents consulted are given in the references. Discussions were conducted with EPA management staffs and several designated technical and management staffs of stakeholder federal institutions. The ideas and the requirements of the regions were obtained from the respective regional NCSA reports.

The generic stocktaking, capacity needs assessment and a capacity building action plan reports made earlier, which were discussed at a workshop organized to review and assess the findings, conclusions and recommendations were the basic resource documents for the consolidation of NCSA reports. The regional reports were also used for the consolidation of the action plan.

It is important to note that the actual outcome of the proposed action plans of the different regions did not provide the capacity building requirements in quantitative terms and could not therefore directly be incorporated into the consolidation of National Action Plan. Rather most of the Regional Action Plans are not very much different from the generic reports earlier prepared by the consulting team. As a result, the consulting team had to make an extensive review of various documented sources to identify pertinent information on each component and build these into the capacity building requirements on the basis of what are considered realistic assumptions so that the action plan would be as close as possible to the reality on the ground with a vision to establish sustainable communities all over the country in perspective which is in line with the environmental sustainable vision of Ethiopia. All stakeholders at national, regional and community levels are assumed to adopt a new way of thinking and acting about their future, by pursuing a new approach to community development that simultaneously seeks to protect the environment, alleviate poverty, improve the quality of life, and secure a strong and vibrant local economy

The success in environmental management and sustainable development is mainly the result of the capacities created to enable relevant stakeholders at different levels effectively plan and implement projects addressing their felt and expressed needs. Capacity building is a long-term process that involves both international and national institutions in filling the major capacity gaps that were identified in the stocktaking exercise.

The national implementation efforts have revealed that many common obligations exist under the different Conventions. While it is recognized that each convention stands on its own, with its own defined objectives and commitments, there is also an inherent relationship and mutual dependency between all of them. Understanding the synergies among these conventions and the reality on the ground a holistic (i.e. cross-cutting) approach to national strategy development and capacity building was followed.

Six thematic areas have been identified for the implementation of the obligations of the international agreements. These thematic areas, however, go beyond the mere implementation of specific provisions, and the capacity building definition but ensure that environmental management and sustainable development efforts are need driven and long lasting. These thematic areas are the basis for conducting the proposed capacity needs assessment.

The strategic goals drawn from the specific objectives are listed and the priority activities to meet each of the strategic goals identified. A priority matrix is constructed for each of the strategic goals under each thematic area showing the scale of the problem, level of concern, and ability to adequately address the issue. The strategic goals are then priority ranked, again for each thematic area, on the basis of these factors.

Priority issues (strategic goals) have been determined under each thematic area. Relevant capacity constraints were identified, within each thematic area. Prioritization matrix” was used in order to prioritize the various strategic goals identified under the different thematic areas. This priority setting exercise resulted in a manageable number of issues, which are of paramount importance and which may require capacity building both at federal and regional levels. In this context, “capacity constraints” were defined as something that prevents effectively addressing the respective strategic goals. Several crosscutting capacity constraints were identified for the realization of the strategic goals (Box 1). For each strategic goal priority activities are identified.

Based on the capacity constraints and opportunities for capacity building identified, strategies for capacity building to protect the national and global environment at individual, institutional and systemic levels are identified. Detailed projects should be prepared on a case-by case situation as the national action plan on capacity building is an indicative plan and based on professional judgments.

Box 1. Capacity constraints

- awareness and exchange of information;
- national policy, legal and regulatory framework;
- institutional mandates, co-ordination and processes for interaction and co-operation between all stakeholders;
- information management, monitoring and observation;
- mobilization of science in support of decision-making;
- financial resources and technology transfer;
- incentive systems and market instruments;
- negotiation skills;
- co-operation and networking with regions;
- institutional management and performance; and
- individual skills and motivation.

Source: GEF

1.4. The Framework and Principles of the National Capacity Needs Self-Assessment Action Plan

1.4.1. The International Framework

Around the world nearly a billion households, particularly the rural poor rely directly on natural resources for their livelihoods. But global environmental threats are undermining this resource base. Biodiversity loss is proceeding at a rapid rate in many countries, because desertification, drought, and the build-up of toxic chemicals are problems of global dimension, affecting all regions. Greenhouse gas emissions pose risks to the world's climate and developing countries are likely to be the most vulnerable to the impacts. This is because carbon dioxide emissions to the atmosphere already exceed all sustainable limits. Half of the world's population lives on less than \$2 per day, and the richest 25 % of the world's population is using 80 % of the world's resources thus creating an inequitable situation where benefits accrue to the rich and the poor incur costs disproportionately.

In the light of the above, environmental management and sustainable development have become key concept, that have gained increasing international acceptance. A milestone in this process was the UN Conference on Environment and Development (UNCED), the Earth Summit, which established a number of international agreements, declarations and commitments (Box 2).

Box 2: Four cornerstones of the Earth Summit

1. ***The Rio Declaration on Environment and Development:*** a set of principles, which provide guidance on achieving sustainable development.
2. ***Framework Convention on Climate Change:*** an international treaty to stabilize greenhouse gas concentrations in the atmosphere.
3. ***Convention on Biological Diversity:*** an international convention with three objectives: the conservation of biodiversity, the sustainable use of its components, and the equitable sharing of benefits from genetic resources.
4. ***Agenda 21:*** a global program of action for achieving sustainable development to which countries are “politically committed” rather than legally obligated.

At the earth summit, the Intergovernmental Agreement on the Environment (IGAE) endorsed the concept of ecologically sustainable development, ESD (development that improves the total quality of life, both now and in the future, in a way that maintains ecological processes on which life depends) and set the following principles for policy making and program implementation:

- Precautionary principle;
- Intergenerational equity;
- Conservation of biological diversity and ecological integrity; and
- Improved valuation, pricing and incentives (which includes consideration of environmental factors in the valuation of assets and services, polluter pays, prices based on the full life cycle costs, and cost-effective pursuit of environmental goals by use of incentives and the market system).

In recognition of the linkages between poverty and environmental degradation, **the United Nations Convention to Combat Desertification (UNCCD)** was established in the wake of the 1992 Earth Summit in Rio de Janeiro (Box 3).

Box 3: The UNCCD is the first international treaty to:

- Address issues of poverty and environmental degradation in rural areas, particularly in Africa;
- Recognize that grassroots resource users are central to identifying and implementing solutions;
- Adopt a bottom-up approach, involving the active participation of women as well as men in the local communities, in all phases of the development process;
- Emphasize the need for an integrated approach to combating desertification;
- Call for an innovative mechanism - the Global Mechanism - to mobilize substantial resources, through partnership at all levels.

In 1992, at the Earth Summit in Rio de Janeiro, world leaders adopted Agenda 21, the global action plan for sustainability, which calls on all countries of the world to undertake a comprehensive process of planning and action to attain sustainability. Chapter 28 of Agenda 21 (known as Local Agenda 21) recommends local governments to also undertake such a process². Agenda 21 defined sustainable development as: *"Development today must not undermine the development and environment needs of present and future generations."* Only a comprehensive, long-term conceptualization of sustainability -- one that includes concern for, and work on, environment, social needs, and the economy -- can meet those objectives. These principles are also highly integrated with rehabilitation and sustainable use of the environment, which Ethiopia considers as top priority in its over all rural development strategy (ADLI).

The primary goal of the Summit, as clearly indicated in Agenda 21, was to find an equitable balance between the economic, social and environmental needs of present and future generations in the process of mitigating

² Chapter 28 states: *"Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and are the level of government closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development."*

the environmental degradations and to safeguard the environment from further threats. The summit equally aimed at laying the foundation for a global partnership between developed and developing countries as well as between governments and sectors of civil society based on the common understanding of shared needs and interests to eradicate poverty and foster sustainable development worldwide

Among other features, Agenda 21 encourages local governments in each country to work closely with their citizens to develop a “Local Agenda 21 (LA21).” Under LA21, local governments are encouraged to:

- Learn from citizens and from local, civic, community, business, and industrial organizations about their priorities, values, and proposed solutions;
- Acquire information needed for formulating the best implementation strategies, and to implement appropriate policies, laws, and regulations to move toward sustainable development in their communities; and,
- Formulate local sustainable development action plans in cooperation with their citizens

Capacity building is the long-term, voluntary process of enhancing the ability of a country to identify and solve its own problems and minimize risks, and to maximize its opportunities. It involves both the mobilization of human, institutional and other resources and their subsequent strengthening and development. During and after Rio, capacity building for the environment became a major focus for international assistance and cooperation.

Capacity building in developing countries was a major theme of Agenda 21, the global plan of action to achieve sustainable development agreed at the Earth Summit. Since Rio, international lending and aid agencies have begun to realign their strategies for capacity building and the environment. The emphasis is on partnership and collaboration with local actors, who are encouraged to take progressively greater responsibility and leadership for the long term, and to introduce structural changes that are necessary to integrate environment into the mainstream of development.

Integrating environmental concerns in poverty reduction strategies and other national planning processes has been considered as a priority for sustainable development in Ethiopia. Global environmental threats, and issues of global importance such as desertification and drought, present the country with particular challenges in its effort for sustainable development. Their causes and consequences respect no national boundaries, but they call for responses at the international, regional, national and local levels.

In the Ethiopian context addressing the causes and impacts of biodiversity loss, climate change and desertification require measures in sectors such as agriculture, forestry and energy. Development co-operation agencies, which provide assistance in many of these areas, can play an important role in assisting with the capacity building efforts of the country to improve the integration of these critical issues in national planning and policy-making mechanisms.

In several forums OECD member countries have shown their interest and commitment to help developing country partners take advantage of the new opportunities arising from global environmental agreements. These include support for capacity development in the public, private and civil society sectors, while making full use of already available capacity.

The extent to which developing country Parties will effectively implement their commitments under the Rio Conventions will depend on the effective implementation by developed country Parties of their commitments

under the Conventions. The commitments of the developed country Parties will take into account that economic and social development and poverty eradication are the overriding priorities of the developing country Parties and hence will be fully involved in the transfer of technology as well as the provision of financial support. The OECD support to the developing country Parties is based mainly on the following four Rio principles;:-

- Rio Principle 6: -The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.
- Rio Principle 7: - States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge their share of responsibility in the international pursuit of sustainable development in view of the disproportionate pressure, their societies place on the global environment, on the one hand, and the technologies and financial resources they command, on the other.
- Rio Principle 9: - States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.
- Rio Principle 10: - Environmental issues are best handled with the participation of all concerned citizens at the appropriate levels. At the national level, each individual shall have appropriate access to publicly held information concerning the environment including information on hazardous materials and activities in their communities, and provided with the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall also be provided to enhance such participation.

Bilateral programs and multilateral financial institutions will also provide additional support where unique opportunities are created for integrating issues of environmental sustainability with poverty reduction efforts. In line with this Ethiopia is in the process of integrating the national action plans formulated under the global environmental conventions to sustainable development programs and poverty efforts. The assistance of developed countries to developing countries to achieve their Millennium Development Goals that are explicitly stipulated in Article 20 and 21 of the Rio Conventions favors the Ethiopian approach.

The feasibility of the capacity building Action Plan heavily depends on a set of principles defining the rights and obligations of States with respect to the basic principles of environment and sustainable development. This capacity needs assessment stipulates that the OECD countries will live up to their commitments and that Ethiopia will meet her own obligations on the basis of the respective undertakings under the environmental conventions and the principles contained therein.

Box 4. The Key Elements of the Environmental Vision of Ethiopia

***Vision:** “To achieve productive environment, self-reliance, improved qualities of life, equity within and between generations of Ethiopia through environmentally sustainable development and stewardship”*

Containing the following Vision:

Ecologically:

- Achieve the optimal use of non renewable resources;
- Attain productive ecosystems through protecting, restoring and enhancing soil, vegetation, water, wildlife and aquatic resources within their regenerative capacity;
- Ensure that a working and efficient system is laid down so that the source and sink functions of the environment shall not be degraded.

Economically:

- Emancipate the generations from a cyclic dependency for livelihood, by way of transforming locally available environmental resources to tangible societal economic benefits through the wise use of natural resources, indigenous knowledge and local capabilities;
- Achieve fair and equitable access and economic benefits through the realization of community rights to economic development and environmentally sustained economic opportunities;
- Attain a diversified economic system to release the pressure on natural resources through value adding environmentally sound alternatives and technology at community/local level;

1.4.2. The Country Framework

The Constitution, as the supreme law of the country, sets the overall environmental values to be preserved and protected in Ethiopia. Based on the constitution the Ethiopian Environmental Protection Authority of Ethiopia has set the national vision for an environmentally sustainable development. The key elements of environmental vision of Ethiopia as it relates to sustainable development are presented Box 4.

Ethiopia’s Sustainable Development and Poverty Reduction Program (SDPRP), which the Government became committed to in 2002, and the Millennium Development Goals (MDGs) of Ethiopia are the centerpiece of its economic and social development program. The MDGs of Ethiopia have also been harmonized and built upon the existing structures functioning for the SDPRP.

The SDPRP and MDGs assume a global partnership as their main components to ensure environmental sustainability in development efforts. SDPRP is also a central element of the newly accepted development document “*Plan for Accelerated and Sustainable Development to eradicate Poverty (PASDEP)*” and for anchoring sustainable environmental management objectives directly to a longer-term development strategy through national capacity building (Box 5).

Box 5. Proposed interventions related to environment under PASDEP

Strategic Goals:

- Improved rural environment for gender equity and sustainable livelihoods (125 woredas)
- Waste management and Pollution Reduction (65 urban municipalities)
- Accelerated Environmentally Sustainable Socio-economic Development that ensures gender equity

Implementation Strategies:

- Promotion of a participatory and problem solving livelihood improvement basis for gender equity, environmental protection and the sustainable use of environmental resources;
- Partnership building with all stakeholders for environmental management;
- Development of tools for proactive environmental management that has mainstreamed gender equity;
- Improvement of a gender balanced environmental knowledge through awareness raising programmes;
- Building an environmental information and networking system;
- Promotion of investment in environmental protection and the sustainable use of environmental resources for the improvement of livelihoods;
- Resource mobilization and channeling for the required activities.

Source: PASDEP, 2005, EPA

Ethiopia is in the process of moving as quickly as possible towards self-reliance in environment management through a well-targeted program of national capacity building with support from the international communities. Many initiatives, which broadly conform to the international principles and Ethiopia’s vision, are being taken to build the environmental capacity of the country³. This has been clearly demonstrated in the country’s guiding strategic framework for the five-year period 2005/6-2009/10 entitled “The Plan for Accelerated and Sustainable Development to End Poverty (PASDEP)”. During this period Ethiopia will continue to pursue important initiatives started under SDPRP⁴. Proposed interventions to ensure

³ The details are presented in the stocktaking report.

⁴ Expanding education, strengthening health and HIV/AIDS, capacity building and decentralization and the food security program

environmental sustainability and their implementation strategies under PASDEP are presented in Box 8 and are consistent with the environmental strategic goals.

For Ethiopia, a critical starting point in building capacity is a sound understanding of the poverty-environment linkage and the threats arising from global environmental degradation. Tackling environmental degradation should go synergistically with improving economic and social welfare. Improving food security and the livelihoods of the rural population requires combating desertification, conserving biodiversity and reducing vulnerability to climate change. Safeguarding the livelihoods of poor and landless peasants, pastoralists or forest dwellers requires protecting the ecosystems on which they rely for food and shelter. Improving access to efficient alternative supply sources of domestic energy improves the health and safety of women and children, reduces the burden of fuel wood collection, and also helps reduce the pressure on forests.

The national institutional setup and the policy environment hold a central place in the country framework, but while these are necessary they would not be sufficient to realize the achievement of the environmental strategic goals. As noted later, there is need for a broad market- and investment-based approach that would offer adequate incentives to all stakeholders to participate in the environmental management effort.

It is also assumed that efforts to ensure sustainability will be the central issue for international and national institutions operating in Ethiopia. Individuals, local community-based organizations, industry and other groups need to do their part as well. Sustainability is not the responsibility of any single group or agency.

1.5. Underlying Principles for proper implementation of NCNSA

Environmental sustainability can be achieved only through sustainable development that improves rural livelihoods. Achieving this will involve long-term integrated strategies that focus, simultaneously, on affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, particularly at the local level. (Article 2, UNCCD).

In the light of this, six thematic areas⁵ and several strategic goals have been identified to provide an additional framework for the implementation of these environmental provisions. These thematic areas and strategic goals are believed to ensure sustainable environmental management and development by improving the livelihood of the communities. Each strategic goal needs to be developed into a project with the involvement of all stakeholders after reviewing the specific problems, constraints and opportunities of the specific communities. Proper project management provides a framework for implementing research projects ensuring that research activities are carried out efficiently and effectively and that scarce resources are used for research that addresses development objectives. Environment and development related projects should essentially follow the general principles and concepts of the management cycle of a project, which includes three phases *viz.*: planning, monitoring, and evaluation.

In an effort to undertake a self-assessment of capacity needs at all levels, and to subsequently build the

⁵ The principal thematic areas identified include: Mainstreaming and institutionalization of environmental issues and improved access to appropriate information and technical knowledge; Community managed environmental protection for improved livelihoods; Rehabilitation of adversely affected ecosystems; Capacity enhancement of ecosystems to deliver goods and services; Management of adverse impacts of municipal waste; and Prevention of environmental pollution.

requisite capacity to implement or enforce the obligations and provisions outlined in the international environmental conventions the following key principles and processes are critical instruments for its success (GEF, 2001). It is believed that integrating these principles into the NCSA process (and beyond) will help to ensure sustainability and the active participation of the stakeholders. Such an approach is also expected to improve coordination, efficiency and accountability.

1. ***Ensuring National Ownership, Leadership and Policy Commitment:*** The NCSA process and related capacity building activities should be nationally owned, led and need driven. This would involve national (and/or regional) experts playing a major role in the NCSA process. In addition, a high degree of national political commitment and leadership – which should be sustained beyond the NCSA process – is considered essential. The regions would decide on their priorities and detailed courses of action, while local communities and administrations would be offered the opportunity to monitor, evaluate and assess their own activities so that they could learn by doing. *Such ownership, leadership and commitment (properly expressed and applied at national, regional, local, and community levels) would constitute an important part of capacity.*
2. ***Utilizing Existing Coordinating Mechanisms and Structures:*** Efforts should be made to take advantage of existing capacity -- government structures, NGOs, CBOs and other institutions that have a stake in environmental protection and management -- in planning and implementing the proposed strategies and projects designed to implement or enforce the obligations and the provisions of the conventions. This will help avoid unnecessary overlap and duplication of effort, as well as ensure continuity in determining coordinated priorities and follow-up action in an integrated manner. *This will also avoid misallocation of resources where a non-integrated approach may result in the creation of redundant institutions that will not necessarily enhance existing capacity.*
3. ***Promoting Comprehensive Participation:*** The detailed formulation processes of strategies and projects in relation to environment and sustainable development should ensure involvement of all affected and interested parties (including the wide range of relevant governmental ministries and agencies). In particular, local communities and the private sector have increasing responsibility to foster environmentally sustainable development. An important aspect is the inclusion of stakeholders at the early and formative stages, especially when decisions (targets) are to be made on how the NCSA will be implemented. Involving stakeholders at an early stage would result in the identification of issues which might have otherwise been overlooked or not considered as important, but which could prove to be of high significance for certain stakeholders or for the matter in question. *Genuine participation would create greater critical mass to effectively deal with the complex issues of environmental protection and management.*
4. ***Adopting a Holistic Approach to Capacity Building:*** This involves recognizing and addressing the various dimensions or levels of capacity, which include the individual, the institutional and the systemic (e.g. the overall policy framework in which individuals and organizations operate and interact with the external environment and the formal and informal relationships between institutions). An inadequate emphasis to address problems at the systemic level may, for example, diminish the impact of efforts at the institutional and individual levels. A proper balance, therefore, needs to be established between all three (closely interlinked) levels of capacity building. A holistic approach also means ensuring co-ordination and complementarities across sectors. *Effective capacity building requires a holistic approach.*

5. ***Adopting a Long-term Approach to Capacity Building within the Broader Sustainable Development Context:*** The NCSA should be considered as a starting point – or a contribution – to a long-term process, which strengthens the thematic programs and projects proposed. Environmental protection and management for sustainable development requires long-term commitment and action. Projects such as NCSA are the building blocks for the long-term development of a sustainable and self-driving program. *Capacity needs will be seen in this long-term perspective in order to be able to promote individual, institutional and systemic commitment to deal with the problems of environmental protection and management on a sustained basis.*
6. ***Gender Mainstreaming:*** Understanding the structure and dynamics of gender relations in a specific community is central to a sustainable development. While the consulting team assumes that gender will be an important aspect of social organization that brings sustainable development, it does not assume it will be the only one, nor the most powerful, nor that gender relations will be the principal determinant of women's situation. As a result implementation of projects and programs should look at the culturally specific forms of social inequality and division of labor, and try to see how gender is related to or interlocked with a wide variety of forms of social hierarchy.

The gender issue in the proposed National Capacity Building Assessment projects will be addressed through Gender Mainstreaming. 'Gender mainstreaming is defined as “a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of the policies and programs in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated⁶⁷”. The relative status of men and women, the interaction between gender and ethnicity, class and ethnicity, and questions of rights, control, ownership, power and voice – all have a critical influence on the success and sustainability of every development intervention. Mainstreaming is not only about adding a “woman's dimension” or even a “gender equality dimension” into a project. It goes beyond increasing women's participation in the entire project planning process (Box 6).

Capacity building for gender analysis; development of accountability mechanisms; allocation of sufficient resources; explicit, coherent and sustained attention to gender equality; targeting not just 'soft' areas for gender mainstreaming (such as health and education), but also supposedly 'gender-neutral' areas, such as infrastructure development and economic policies; and strong political commitment and will are the basic principles to be followed at all levels.

Box 6: Guideline for gender mainstreaming practices:

- identifying gaps in gender equality through the use of gender-disaggregated data;
- developing strategies to close those gaps;
- putting resources and expertise into implementing strategies for gender equality;
- monitoring implementation; and
- holding individuals and institutions accountable for results

7. **Promoting Eco-Investment:** In order to realize the environmentally sound development vision of the country it is absolutely necessary to adopt a market-based approach. To ensure sustainability, environmental management needs to simulate a dynamic system, where environmental management interventions are complemented by a coherent and marketable strategy. Thus, environmental management activities have to link with concrete financial or economic returns. Environmental management objectives need to be driven by market factors that avoid economic loss and negative capital formation resulting from environment friendly economic decisions and activities.

The assessment of the strategic goals has helped identify a number of interventions that can ensure environmental services and sustainable development including both reactive and proactive mechanisms, as well as those outside the conventional sphere of dependence only on policy and regulatory measures. It is therefore imperative to put in place a business approach to environmental management by involving the private sector. This can only be true if we manage to seek solutions for the problems through participatory and strategic competence of meeting the sustainability challenges through linking environmental management efforts with the creation of investment opportunities – particularly opportunities for eco-investment by different stakeholders. The potential areas of eco-investment are presented in Box 7.

Box 7. Potential eco-investment areas

1. Physical intervention areas

- Private or community Wood lot development
- Public and Government managed Natural forest resources and protected areas (National Parks, game reserves, sanctuaries, controlled hunting areas, etc)
- City greening; green parks
- Production of organic fertilizer;
- Reclamation of abandoned infrastructures and degraded areas
- Commercial forestry
- Rehabilitation of natural and cultural heritages

2. Service giving intervention areas

- Environmental Impact/risk Assessment
- Eco tourism development
- Waste collection, recycling, treatment and disposal
- Environmental management system development and certification
- Eco-labeling scheme development
- Environmental [monitoring] Laboratory
- Environmental auditing
- Trading in environmental goods and services [Emission trading [Carbon trading through the CED (Clear Development Mechanism) of the Tokyo protocol

⁶ United Nations Economic and Social Council in 1997

8. Sustained evaluation of projects and their impact. Evaluation places more importance on the appraisal, the analysis and the determination of the quality of development activities and their results. Evaluation can take place before (ex ante), during, and after (ex post) the implementation of the project especially to capture lessons learnt from the pilot projects for full scaling up. The main criteria for each project are presented in Box 8.

Box 8: Evaluation criteria for projects:

- **Relevance** of the project will be addressed by evaluating whether the purpose and overall objectives, and results are in line with the needs and aspirations of the beneficiaries and within the policy framework of the country.
- **Impact** will be addressed by analyzing the nature and directions of the changes towards the achievement of the overall objectives of the project.
- **Effectiveness** of each project will be analyzed by assessing the extent to which the project objectives have been achieved, to what extent is the achievement a result of the project.
- **Efficiency** assessment will concentrate on the planning and monitoring processes to evaluate the management performance of the different forums that are going to be established at different levels. Efficiency concerned with the relationship between the results and means.
- **Sustainability** of each project should be addressed by critically assessing based on the magnitude of the benefits produced by the project will continue to trickle after it has come to an end (what will happen after the project?).

1.6. Stakeholders for NCNA

Government, non-government (NGO), community based (CBO) organizations and the private sector are all important vehicles in the process of the formulation and effective enforcement of the obligations of agreements which Ethiopia has ratified (Box 12). Government organizations and local authorities are essential in providing the regulatory and other strategic services, while NGOs engaged in environmental conservation and sustainable utilization of resources can help in networking, making resources available and sharing experiences. On the other hand, the participation of CBOs is critical in the programming and implementation phases.

The government organizations that are important in the enforcement of the agreements include the following: (i) the Federal Environmental Protection Authority (FEPA) and its representatives at Regional, Zonal and Wereda levels (collectively designated as the Regional EPA or R-EPAs), (ii) Institute of Biodiversity Conservation (IBC) and (iii) the Ministry of Agriculture and Rural Development (MoARD) and the Agriculture and Rural Development offices at Regional, Zonal and Wereda levels. In addition, the Ministry of Water Resources (MoWR), the Ethiopian Tourism Commission (ETC), and their respective representatives at Regional, Zonal and Wereda levels are also important stakeholders in the implementation of the projects. The capacity of woreda administrations and the executive bodies are center points for proper planning and implementation of environmental projects.

Box 9. Stakeholder groups for the implementation for the national capacity building

- **Local:** Woreda officials, local communities and local NGOs, CSOs and private sector operators delivering environmental management system;
- **Regional:** Regional governments and zones working on capacity building, program development and strategies to achieve MDG targets, as well as NGOs working at this level;
- **National:** National policy makers, international organizations working on policy and practice and developing broader macro-economic and social policy; and
- **International:** bilateral agencies, the UN system, and international NGOs.

There are several NGOs engaged in different environmental and conservation activities in Ethiopia. These can be coordinated and their activities geared to the principles and goals of the Rio and other environmental conventions ratified by Ethiopia.

Community Based Organizations (CBOs) are very important players in the horizontal dissemination of awareness and technical knowledge in environmental safety and conservation. These include community based formal institutions such as Youth and Women's Associations and informal and traditional social and economic institutions. These could play pivotal roles in the identification, implementation and evaluation of environmental activities, but it would be mandatory to coordinate their responsibilities and activities for successful capacity building to attain a common goal.

Over the last 30 years rural communities have witnessed government and NGO efforts to improve their socio-economic welfare through development projects. However, many of these projects have failed to achieve self-reliance through capacity building, or to achieve financial sustainability because of the simple fact that these projects were not community based. It has been shown that when the community itself is made responsible for the identification of its problems and proposing potential solutions, the effectiveness of project implementation is far greater than when this initiative is undertaken through a top down approach.

Peasant farmers organized as associations could facilitate the implementation of rural development programs and policies in Ethiopia. These peasant associations, originally formed for the implementation and enforcement of the 1975 land reform measures, presently represent the lowest level of government administration and can provide a useful institutional structure and means for training of farmers as part of the capacity building endeavor for the implementation of the various programs in environmental protection and utilization of environmental resources.

The hierarchical organization of the Government institutions, the existence of several NGOs and CBOs as well as the peasant associations all over the country provide the necessary base for a successful implementation of the programs if the financial and other resources promised by the developed countries to the developing countries to achieve their MDGs are made available in the right amount and at the right time.

The government and non-government organizations discussed above also contain the key stakeholder groups, which will have important roles in the realization of the environmental strategic goals. The following primary target groups will be involved: civil society and the general public; the development community; the private sector; and policy makers and professional experts. These are at the local, regional, national and international levels and will be involved in project design, implementation and the scaling up of the best results.

1.7. Implementation Modalities

1.7.1. Institutional Arrangement

Ethiopia is divided into 9 regional states and two chartered cities (Table 1). The possibility of local control of environmental problems recognizes that the Weredas and the communities have the best understanding of local problems, issues, and needs. By decentralizing decision-making authority, environmental actions can be tailored to meet the specific needs of a community or region. It is, therefore particularly important to identify and make use of existing institutions at the national, regional and woreda levels such as EPA, MoARD, MoWR, and their respective offices at regional and woreda levels which are already in place in the thematic areas identified to bring sustainable development.

The NCSA process should bring together the various national agencies, institutions and organizations whose activities have important direct or indirect impacts on the environment, and will encourage them to assess gaps, identify synergies and devise a coordinated approach for strengthening overall capacity. By putting in place or making use of existing mechanisms for consultation and co-operation, and by carrying out the necessary scoping, analysis and planning in an integrated fashion, the country can make significant progress in enhancing their capacity for environmental management. The NCSA should contribute to strengthening existing national programmes and should lead to targeted action plan development and implementation both within and across the thematic areas of biodiversity, climate change and desertification/land degradation. It should also help to identify linkages between global and national environmental management issues and capacity building efforts.

Over the last several years, a number of environmental problems have surfaced in Ethiopia that entails serious ecological, public health, and economic impacts to the nation. Under the current decentralization

arrangement, Wereda administrations (local governments) have been given broad, new responsibilities to address environmental problems (Box 10).

Devolving power to woredas and communities has enormous promise for helping to solve environmental problems at the local level and promoting sustainable development. Every community selected for the implementation of the project should first develop a community vision, make an assessment of environmental issues, set priorities, identify the most appropriate strategies for addressing the top problems, and implement actions that advance sustainable development.

Table 1. Total Number of Zones and Woredas by Regions in Ethiopia

No.	Regional State/	Number of Zones	Number of Woredas	Remarks
1	Oromia	14	207	
2	Amhara	10	105	+ Bahr Dar zone
3	SNNP	18	93	+ Awassa zone
4	Tigray	4	35	+ Mekele zone
5	Benshangul Gumuz	3	35	
6	Gambela	2	8	
7	Somali	3	40	
8	Afar	2	29	
9	Harari	1	3	
10	Addis Ababa*	2	28	Chartered city
11	Dire Dawa*	1	2	Chartered city
	Total	60	585	

Box 10. Local government environmental responsibilities

- Managing solid waste;
- Controlling the disposal of dangerous substances on their territory;
- Providing clean and adequate supplies of drinking water;
- Managing waste water;
- Protecting and maintaining green areas;
- Planning for and controlling land use; and
- Educating the public about environmental issues.

Source: EPA, 2203

A forum for bringing together a diverse group of organizations and individuals with diverse interests, values, and perspectives should be established prior to implementation. Major institutions in the community, businesses, non-governmental organizations (NGOs), academic and scientific institutions, and government agencies are important stakeholders. The institutions and individuals will work together to forge a consensus on recommended priorities and actions for addressing environmental concerns and sustainable development. The recommended priorities and actions will be compiled in an Environmental Action Plan (EAP) that serves as a blueprint for future environmental investments in the community. Recommendations from the EAP are then incorporated into the decisions of the Woreda/Community/Municipality Council and other implementing bodies.

Four-level fora of key stakeholders will be established at local, regional and national (federal) levels in order to sustainably plan and implement development activities. Policy makers, local communities, experts and other actors will be involved through these fora from the inception phase onwards. , EPA and R-EPAs will lead the consortiums at federal and regional levels respectively

a. National level forum: At national level it will aim to increase cooperation among the ministries and other concerned government agencies required for improved service delivery and to strengthen the coordination between government and donor organizations. This forum should synchronize with the initiatives taken by either party and not duplicate them. The forum for this program will specifically look at improved planning at regional level and how national policies and modes of cooperation should support this. This means that this forum concentrates on the level of operation and implementation and this may be different from other national initiatives in Ethiopia. This forum functions towards the regional and *woreda* fora.

The specific functions of the national forum towards the regional and *woreda* fora include:

- Overall coordination and provision of guidance for the development path and inputs with ideas and suggestions Supervision of activities;
- Discussion of development outcomes with the regions;
- Discussion of implications of development outcomes for policy, cooperation, legal framework etc;
- Establishing of the program's credibility and acceptance in the regions;

b. Regional level forum will be established as the nodal points for learning and action for improved service delivery so they are in a position to interface between national level policy making and financial flows on the one hand, and woreda level implementation, on the other:

- Plan and implement environmental development activities; the regions will also have sufficient strength to pick up changes coming out of the program;
- Leading action plan development and learning;
- Overview of environmental problems and resources in their constituencies;
- Designing the systems and building the capacities for planning capacity building at the level of *woredas* and communities;
- Coordinate all implementing agencies that are found at regional;
- Create economies of scale and to harmonise and standardise planning of service delivery in favour of *woreda* implementation without losing sight of the location specific requirements;
- Discuss approaches for service delivery, define key obstacles and design improvements;
- Present the key interface for translating development findings into suggestions for improved policy, sector coordination, financing flows etc., which need to be discussed at national level.

c. Woreda forums: In each of the regions, *woredas* will be selected to participate in the program and in each of them a forum will be established. The members of the *woreda*-level consortiums will be the relevant sector institutions (agriculture, water, health, etc), civil society organizations and CBOs, private sector and international and local implementing agencies led by the *woreda* administrator. A series of inter-linked stakeholder sub-fora will be created at key institutional levels (typically national, intermediate and local/community) to break down barriers at both horizontal and vertical information sharing and to speed up the process of identification, development and uptake of innovation. Each sub-forum is intended to group together a range of partners with complementary capabilities in such areas as implementation, regulation, policy and legislation, development and learning and documentation and dissemination. The forums in the *woredas* are needed to learn about and:

- Improve demand driven implementation;
- Improve the implementation process as a whole;
- Set up and support environmental management committees and operators in the *kebeles*;
- Increase the benefits from service delivery to improve health, incomes and livelihoods diversification and security;
- Establish needs for equipment, systems and capacities at *woreda* level to improve sustainable environmental management.

d. The community forum will focus on delivering development activities and practical learning processes. The lessons from these processes will be monitored and evaluated and form part of the broader development exercise, helping to demonstrate to policy makers and practitioners at higher levels on how environmental management linkages can be established and made effective in improving the livelihood of the local communities. The community forum will also provide the basis for on-going assessment of sustainability trends at a grassroots levels and for determining the nature and magnitude for scaling up program activities.

- The *woreda* and regional forums will review the development agenda and output on an ongoing basis in conjunction with the local communities. Revisions to the program (within the parameters set during the inception and mobilization Phase) can then be suggested on a consensual basis.
- A development concept paper at the inception and mobilization phase will explain the development rationale to a broad audience in local languages. This paper will convey the basic objectives of the project and seek to engage key stakeholders in the development.
- A champion to advocate and support the forums: Someone with broadly accepted prestige in the communities with easy and respected access to the offices of both government and donor organizations.
- Local development capacity: The stakeholders may not necessarily have all the capacities needed for doing systematic action plan development. A local development partner is therefore needed to help the stakeholders in their development activities.
- Facilitators for every forum: For commitment of the stakeholders to the forum process and for keeping the momentum a (senior) sector expert is required to facilitate the forum under the leadership of government institutions. Seniority is needed because often political differences and conflicting interests have to be addressed; and to increase the credibility of the work of the forum and guarantee support of all relevant stakeholders to the process;

1.7.2. Implementation approach

The environmental capacity building action plan is expected to include all relevant Federal Institutions and Regions. The consolidation of the regional plans into a national plan of action requires well thought out region specific action plans with numbers showing where and in how many sites capacity building activities will be carried out. However, the Regional studies could provide none of this information at the present stage due to obvious difficulties (including existing capacity constraints) and uncertainties in projecting the content and pace of the component's proposed implementation over the 10-year period. In view of this, the consultant team proposes a three-phased approach, even though activities will be overlapping and interlinked.

- **Phase 1 (Mobilization/inception phase, up to 1 year):** preparation of the basic capacity building pre-requisites (training manual preparation, awareness creation, and training of trainers) at Federal, Regional and woreda levels. Establishing proactive tools, infrastructure for networking and laboratories, scoping projects, forum establishment and methodology development and work planning are also the basic features of phase 1.
- **Phase 2 (Pilot phase, 2 years):** planning and running well defined pilot project activities (see details in Table 2) in selected woredas (per zone) and communities (per woreda) in four selected regions (Oromia, Amhara, SNNP and Tigray) to assess constraints and opportunities and obtain the basis for future time-bound expansion to cover the whole country.
- **Phase 3 (Scaling-up phase, 7-8 years):** implementation, consolidation including monitoring and evaluation.

The coverage will expand at an increasing rate as experience is gained and the proficiency of local based trainers gains momentum. A total of 583 woredas will be included over the ten-year period in all the regions (Table 2). The total number and the respective regional shares are presented in Figures 1 and 2. While Oromia takes the largest share (36%), Harari will constitute only 1%.

In every woreda, three selected representative communities will be included (Table 3). The selection of communities should be based on certain objective criteria, such as representation of agro-ecology and farming systems in the woreda, accessibility for frequent monitoring and evaluation, location for mobilizing other communities, etc. The first year would be devoted to training manual preparation, awareness creation and training of trainers. This, however, could be modified depending on the size of the region and availability of qualified and experienced experts in the respective regions. It is also envisaged that the Federal Institutions need to provide comprehensive support to the less developed regions such as Afar, Somali, Gambella and Benshangul.

1.8. Additional Mandate for EPA

The forums at the different levels will be instrumental in facilitating the implementation of the action plans for capacity building. They will also strengthen the sense of ownership of the action plans and the outcomes. On the other hand, practical considerations call for the presence of a driving force to energize the concerted and productive engagement of these forums and to help the internalization and devolution of environment management and sustainable development capacity building. It is thus proposed that a unit in the office of EPA's Deputy Director General be set up to assume these functions.

The unit should be staffed by two seniors and appropriately experienced expert advisors (one national and one international) whose responsibility will include scheduled visits to the regions for the purpose of supporting the different forums' engagement. The unit will also develop an EPA withdrawal strategy to enable the regional forums to assume this responsibility completely.

Table 2. Number of woredas to be included in the project by region and year

Region	Year										Total
	1	2	3	4	5	6	7	8	9	10	
	C										
Oromia	A	3	6	9	15	20	30	35	40	49	207
Amhara	P	2	4	7	10	12	14	16	18	21	104
SNNP	C	2	4	6	8	10	12	14	16	21	93
Tigray	I	1	2	3	4	5	6	7	7	0	35
Benshangul	T	0	1	2	3	4	5	6	7	7	35
Gambela	Y	0	0	1	1	2	2	2	0	0	8
Somalia		0	1	2	3	4	5	7	9	9	40
Afar	B	0	1	2	3	4	5	6	8	0	29
Harari	U	0	1	1	1	0	0	0	0	0	3
Addis Ababa	I	0	1	2	3	4	5	6	7	0	28
Dire Dawa	L			1	1						
Total	D	8	22	36	52	65	84	99	112	107	585

Fig 1. Total Number of Woredas over 10 Years

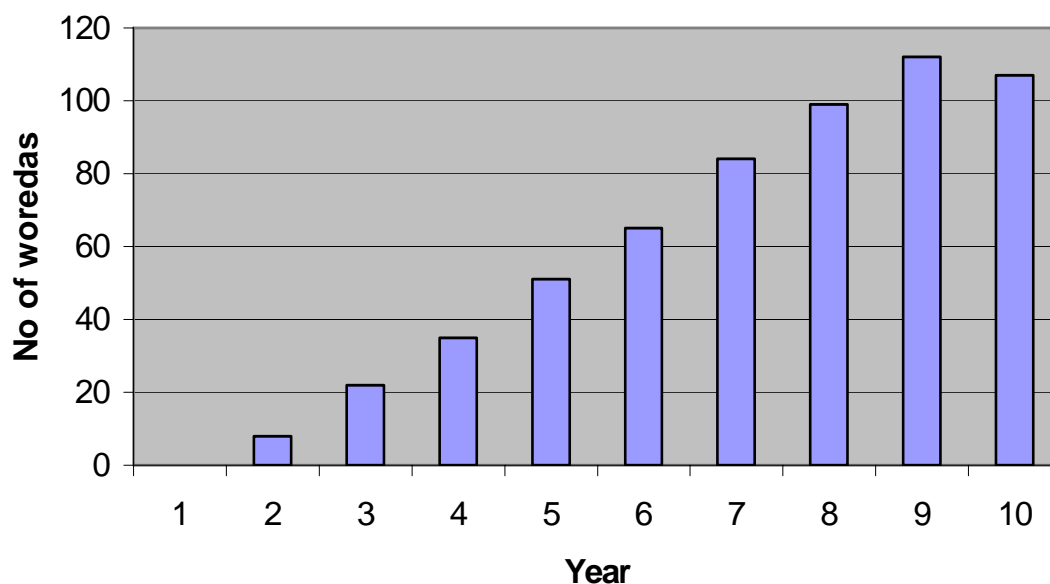


Fig 2. Percentage share NCB by Regions

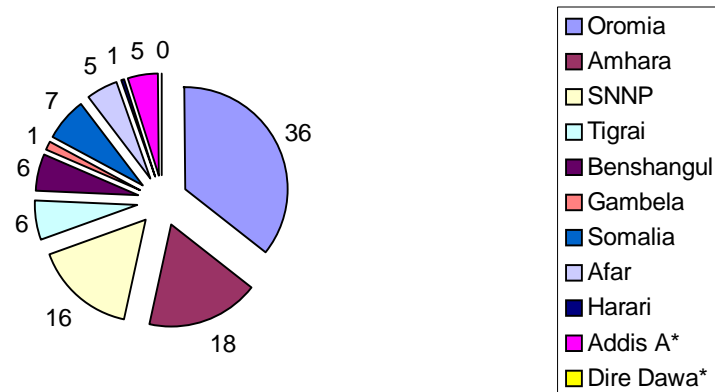
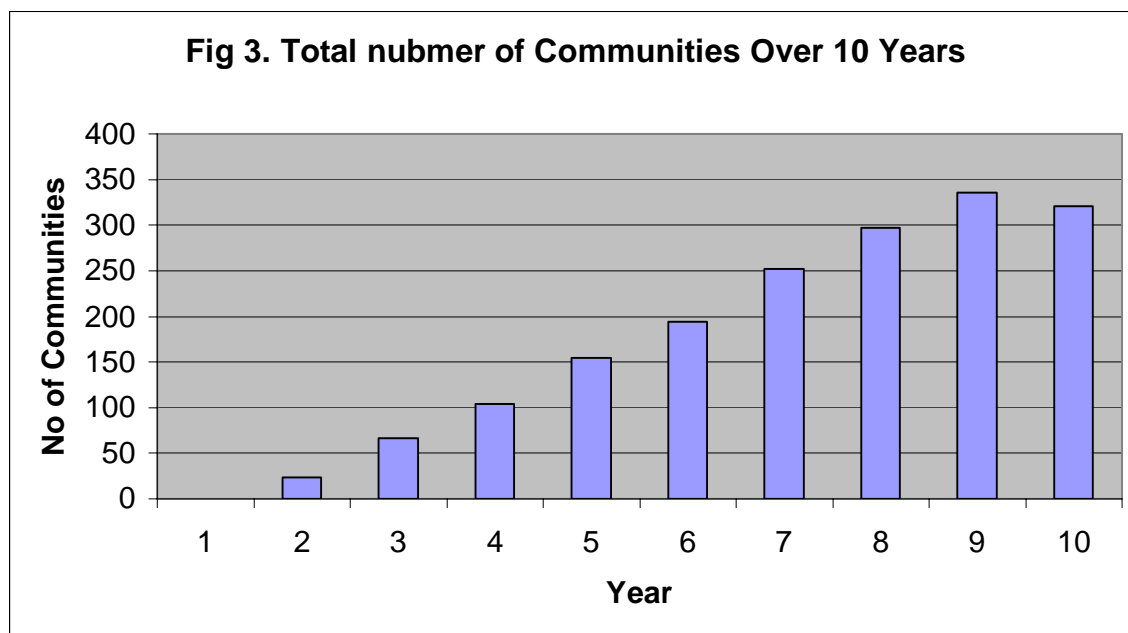


Table 3. Number of Communities to be included in the project by region and year

Region	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Oromia		9	18	27	45	60	90	105	120	147	621
Amhara		6	12	21	30	36	42	48	54	63	312
SNNP		6	12	18	24	30	36	42	48	63	279
Tigray		3	6	9	12	15	18	21	21	0	105
Benshangul		0	3	6	9	12	15	18	21	21	105
Gambela		0	1	2	4	5	6	6	0	0	24
Somalia		0	3	6	9	12	15	21	27	27	120
Afar		0	4	6	9	12	15	18	24	0	88
Harari		0	3	3	3	0	0	0	0	0	9
Addis A*		0	4	6	9	12	15	18	21	0	85
Dire Dawa*			3	3							6
Total		24	70	107	154	194	252	297	336	321	1755



1.9. Resource Mobilization

The approach used in preparing this national capacity building synopsis is to establish the framework for sustainable environmental management and development in line with the national development strategies. The activities and the financial resources presented under each thematic area go beyond the capacity building aspect of mere implementation of specific provisions. As capacity building with out implementation activities on the ground does not bring and ensure sustainable development, the implementation part of the strategic goals are also indicated along with the estimated cost requirements that are need driven and long lasting. As a result the estimated financial requirement is too high.

Financial requirements for capacity building and for the implementation part are estimated separately as soliciting resources and coordination activities are done separately. In this regard EPA should concentrate on the capacity building components of the action plan while the respective ministries and institutions should address the implementation part, which is a long-term commitment.

Resources required for environment management include human, financial, technical and knowledge-based resources. These resources could be mobilized from different sources: community, private sector, government and international communities Promoting eco-investment is also key strategy as explained earlier. The resources that can be mobilized depend on what opportunities are available, government enabling policy environment, institutional staff capacities, and partners in a given country. The environmental management projects proposed are many in number and require huge amounts of financial and technical resources, which is difficult to meet from national sources alone. Resources are therefore envisaged to be generated from a wide range of sources including those generated by the communities, external assistances and loans (Box 11).

Box 11: Potential Sources for Resource Mobilization

- I. Local communities are expected to cover up to 25% of the costs both in kind and cash.
- II. Federal and Regional Governments of Ethiopia, which are assumed to cover at least 25% of the costs
- III. The Private Sector (individuals or cooperatives of the communities) are also potential investors with the support of the International and national institutions.
- IV. Official Development Assistance (ODA) from bilateral agencies; technical assistance from United Nations Agencies, grants, credits and loans from multilateral financing institutions such as the World Bank, ADB, EIB; international foundations, and International Non Governmental Organizations. These sources are assumed to cover at least 50% of the program costs on a case by case basis)

II. Summary of Stocktaking Report

2.1. International environment agreements

A key outcome of the 1992 Earth Summit in Rio was the adoption of a number of major multilateral environmental agreements that form the basis for state obligations with regard to environmental protection and sustainable development. In this context, Ethiopia has ratified the multilateral environmental agreements listed in Table 4. The stocktaking report provides brief up-dates on the current status of International environment agreements. It also outlines their broad aims, procedures, national obligations and rights.

While EPA is the focal point and coordinator of the international conventions and agreements regarding environment and bio-diversity, there are several implementing institutions and major stakeholders that have the interest, and the necessary mandate and capacity. Regional States have also established and in some instances designated their respective environmental agencies.

Table 4. Current Statuses of the Rio International Environment Agreements

Convention	Date of Signature	Date of ratification	Focal point	Implementing Institution
The Convention on Biological Diversity (CBD)	June 10 1992	Apr 5 1994	IBC	IBC
The Cartagena Protocol on Biosafety (CPB)	Jan 29, 2000	Sep. 22, 2003	EPA	EPA
The United Nations Convention to Combat Desertification (UNCCD)	Oct. 15 1994	June 27 1997	EPA	EPA
The United Nations Framework Convention on Climate Change (UNFCCC)	Jun 10, 1994	Apr 5, 1994	NMSA	NMSA
The Convention on International Trade in Endangered Species (CITES)	Apr. 5, 1989	July 4, 1989	MoARD	MoARD
The Vienna Convention and the Montreal Protocol for the Protection the Ozone Layer	—	October 11, 1994	NMSA	NMSA
The Basal Convention on the Control of Transboundary Movements of Hazardous Wastes	March 22 1989	October 8, 2003	EPA	EPA
The Rotterdam Convention on the Prior Informed Consent Procedure	—	January 9, 2003	EPA	MoARD
The Stockholm Convention on Persistent Organic Pollutants	May 17 2002	January 9 2003	EPA	EPA

2.1.1. The Convention on Biological Diversity

The major aim of the Convention on Biological Diversity (CBD) is the conservation and sustainable use of biological resources and fair and equitable benefit sharing from the use of biodiversity. The Cartagena Protocol on Biosafety establishes a regulatory framework to control the harm arising from Genetically Modified Organism (GMOs) on biodiversity and human health. Biological resources, both habitats and species, are being critically threatened. Key habitats are being lost at a rapid rate.

2.1.2. The United Nations Framework Convention on Climate Change

The major goal of the Framework Convention on Climate Change is to stabilize the concentrations of Green House Gases (GHGs, e.g. carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) in the atmosphere that are related to human induced interference with the climate system. GHGs are thought to exacerbate climate change and alter agricultural / eco zones e.g. mid-latitude regions are expected to shift 200 - 300 km for each one degree Celsius increase in temperature. Due to glacial melt and thermal expansion of the sea, sea levels are predicted to rise by as much as 65 cm by 2100, threatening both coastal and low lying areas. The frequency and intensity of extreme natural events e.g. storms and hurricanes are also expected to increase.

2.1.3. The United Nations Convention to Combat Desertification

As described in Ch. 12 of Agenda 21, the Convention to Combat Desertification seeks not only to tackle the impacts of desertification but also to mitigate the effects of droughts. Under the convention desertification refers to dry-land areas vulnerable to over-exploitation and inappropriate land-use as a result of poverty, political instability, deforestation, overgrazing and bad irrigation. Currently the livelihoods of over 1.2 billion people are threatened or at risk because of drought and desertification, impacting 110 countries. The detail national obligations and rights are summarized in the text.

2.1.4. The Convention on International Trade in Endangered Species

The overriding goal of the Convention is to ensure that international trade in specimens of wild fauna and flora does not threaten the survival of the species traded. CITES is conceptually limited to prevent the overexploitation of international traded wildlife. Parties must adopt domestic legislation, which prohibits international trade in specimens in violation of the Convention, penalizes such trade, and allows for confiscation of specimens illegally traded or possessed

2.1.5. The Vienna Convention and the Montreal Protocol

The Vienna Convention aims at protecting the ozone layer from modifications, due to human activities, require international co-operation and action, and are based on relevant scientific and technical considerations.

The Montreal Protocol was developed to minimize world-wide emissions of certain substances (controlled substances listed under Annexes A, B, C and E of the Protocol) that can significantly deplete and otherwise modify the ozone layer in a manner that is likely to result in adverse effects on human health and the environment. On the basis of this protocol, protection of the ozone layer involves actions of precautionary

measures to control global emissions of substances that deplete it, with the ultimate objective of their elimination on the basis of scientific research and findings.

2.1.6. The Basel Convention

This Convention is a Global Environmental Treaty aimed at regulating and controlling the transboundary movements of hazardous wastes and their disposal at international and national levels. A central goal of the Basel Convention is “environmentally sound management” (ESM), the aim of which is to protect human health and the environment by minimizing hazardous waste production whenever possible. The key objectives of Basel Convention are to:

- Reduce trans-boundary movements of hazardous wastes to a minimum consistent with their environmentally sound management;
- To treat and dispose of hazardous wastes as close as possible to their source of generation;
- Minimize generation of hazardous wastes in terms of quantity and hazardousness;
- To ensure strict control over the movement of hazardous wastes across borders as well as prevention of illegal traffic;
- To prohibit shipments of hazardous wastes to countries lacking legal, administrative and technical capacity to manage and dispose of them in an environmentally sound manner;
- To assist developing countries in the environmentally sound management of hazardous and other wastes they generate

2.1.7. The Rotterdam Convention on the Prior Informed Consent Procedure

Based on the “London Guidelines for the Exchange of Information on Chemicals in International Trade” and “International Code of Conduct on the Distribution and Use of Pesticides”, the aim of the “Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade” is to protect citizens and the natural environment from potential dangers of hazardous chemicals and pesticides. Each year thousands die or are poisoned by toxic pesticides and chemicals. These substances also accumulate in animals and plant life. Under the agreement export of such chemicals can only take place with the prior informed consent of the importing party. The detail national obligations and rights are summarized in the text.

2.1.8. The Stockholm Convention on Persistent Organic Pollutants

The aim of the Convention on Persistent Organic Pollutants will be to tackle chemical substances that persist and bioaccumulate through the food web and pose a risk to human health and to the environment. It will initially cover 12 POPs including: 8 pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene), 2 industrial chemicals (Poly Chlorinate Biphenyls - PCBs and hexachlorobenzene, also a pesticide) and 2 by-products of combustion and industrial processes (dioxins and furans).

2.2. The Policy and Legal Measures of Ethiopia

Over the past years, the Ethiopian Government has been committed towards an improved natural resources management and environmental protection regime. In order to address the environmental problems and achieving sustainable development, Ethiopia has adapted constitutional, policy and legislative measures.

The policies and strategies on environmental management and protection are emanated from the basic provisions of the Constitution. Several national policy and strategy documents on environmental matters were adopted to determine the objectives and strategies, which should be used in order to ensure the obligations and rights of the environmental conventions, by taking into account the prevailing economic, social and cultural situation of the country. In this context, the Environmental Policy and the Conservation Strategy of Ethiopia were prepared with a view to further amplifying the Constitutional provisions on environmental protection and management. These policy and strategy documents recognized and addressed environmental issues in a holistic manner.

Incorporation of environmental rights under the Constitution, adoption of Environmental Policy and the Conservation Strategy of Ethiopia, ratification of multilateral environmental Conventions, establishment of the Environmental Protection Authority are some of the most important legal measures taken in this respect. Since all these measures provide only a framework rather than detailed plans of action and thus cannot directly be used for actual implementation, the country has also formulated several laws, standards and guidelines to implement the objectives and goals set by the policy frameworks and the environmental Conventions to which Ethiopia has become a party.

2.2.1. Institutional Measures

In order to implement the environmental policies and legislations, the Ethiopian Government has also taken institutional measures. A number of Government institutions share responsibility for the implementation of the environmental and sustainable development obligations and safeguarding of rights contained in the various conventions and protocols described earlier. The most relevant institutions with full and direct responsibility regarding environment among others are:

- Federal Environmental Protection Authority (EPA), and its replicas in Regional States,
- Institute of Biodiversity Conservation (IBC), and
- National Metrological Service Agency.

In addition, several other government institutions, non-governmental organizations and community-based organizations are engaged in rehabilitation and development programs that include environmental and natural resource management activities. Activities of private sector establishments, particularly those in the industrial sector associated with the use or production of chemicals have an important bearing on the environmental obligations that Ethiopia has to meet under the conventions.

2.2.2. Implementation status

Over the past several years, Ethiopia has made some notable progress toward implementing the three Rio conventions and the achievements obtained from implementing some of the conventions are commendable while for some others are below expectations due to several reasons.

The principal activities being undertaken to implement CBD are:

- *Ex situ* conservation
- Community based *in situ* conservation initiative
- Characterization and evaluation

- Establishing protected Areas
- Biological Resources Identification and
- Several projects that include:
 - National Biodiversity Strategy and Action Plan (BSAP) Project (ongoing).
 - Conservation and Sustainable Use of Medicinal Plants of Ethiopia
 - Conservation and Sustainable Use of Biodiversity in the Rift Valley Lakes
 - Invasive Alien Species
 - Indigenous/traditional knowledge

Activities to implement the Convention on Combating Desertification include:

- National Action Program (NAP) to Combat Desertification
- Public Awareness
- Enhancing NGO/CBO involvement in the NAP Process
- Establishment of National Desertification Fund (NDF), (not operational)
- Formulation of Regional Action Programs (RAPs)
- Development of Gender Mainstreaming - Strategy for the NAP,
- Road map for the implementation of NAP,
- Acceptance of the Royal Norwegian Government to serve as chief de file for the implementation of UNCCD/NAP in Ethiopia.

The major activates to implement the UNFCCC include:

- US-Ethiopia Climate Change Country Study Project
- Institutional Support & Capacity Building
- Greenhouse Gases (GHGs) Inventory: Phase I
- Vulnerability, Impact, Adaptation and Mitigation Assessments: Phase II
- GEF-Ethiopia Climate Change Enabling Activity Project
- Greenhouse Gases (GHGs) Inventory and Mitigation Assessment
- Vulnerability, Impact and Adaptation Assessments
- Developing Framework National Climate Change Action Plan

The major activates to implement the CITES include:

- Finalized a draft policy endangered wildlife and wildlife products transport and trade with the aim of Protecting Ethiopia's wildlife resources, develop properly, manage and utilizing sustainably for the economic development of the country.
- Maintaining the government obligations under international treaties and other agreements concerning the protection, conservation or utilization of wildlife resources and habitats.

National activities to implement the obligations Stockholm Convention are:

- Preparation of the National Implementation Plan (NIP) is in the process
- Preparation of Legal instruments and policy measures
- Preparation of Chemical Management Profile for Ethiopia
- The FAO Project on the Removal and Destruction of Obsolete Pesticides

The activities to implement Basel and Bamako Conventions in Ethiopia are:

- Establishing Legal instruments and policy measures
- Promotion of environmental sustainability through cleaner industrial production
- Awareness programs meant to promote the diffusion of ISO 14000 series of EMS

The activities to implement the Rotterdam Convention in Ethiopia are basically on Prevention and Disposal of Obsolete Chemicals Phase I completed and Phase II is underway. The pesticide laboratory of MoRD needs to be upgraded towards accreditation if its test results have to be accepted internationally. The measures taken to implement the Vienna Convention includes the preparation of National Action Plan (Country program) and drafting of several policy documents. The national Ozone office is active in training and awareness programs

2.3. Capacity Gaps

The reports and discussions made with EPA, IBC, NMSA, REPAs, MoARD and other stakeholders that are implementing international conventions indicate that the need for substantial progress on effectively implementing and enforcing these international environmental agreements at the national level. While each convention is at different stages of implementation the nature and complexity of the problems and gaps might be different. The common capacity gaps to properly implement the conventions are summarized in the areas of:

- Institution arrangements;
- Development and implementation of Proactive Environmental management tools;
- Development and implementation of environmental information and networking;
- Laboratory infrastructure;
- Promotion of environmental education and awareness;
- Adoption/adaptation of environmental technologies and best practices;
- Mobilization and channeling of technical and financial resources; and
- Community empowerment in environmental management and sustainable livelihood.

It is crucial that the experiences that have been gained through formulating and implementing existing agreements and targets are shared in partnerships between governments and with other stakeholders such as CBOs and NGOs. This will help in implementing the agreements and make rapid progress in achieving the overarching goal of sustainable development in the country.

III. Summary of Capacity Needs Assessment

In view of the obligations and provisions under each environmental conventions as discussed in the stocktaking part, Ethiopia has serious capacity gaps and constraints to meet its obligations and exercise its rights specified under the respective environmental conventions since the ratification and adoption of the environmental conventions. However, considerable efforts are being made and activities are being considered by the Ethiopian Environmental Authority (EPA) to facilitate strategic planning and reporting mechanisms and to strengthen the capacities of Federal and Regional institutions so as to meet the respective obligations and to take advantage of the provisions of the international conventions that Ethiopia is a party to. The overall progress made so far includes the establishment and strengthening of relevant institutions, enactment of laws concerning biological and environmental matters (including the introduction of some environmental quality standards), and a number of environment-related policies, strategies and action plans prepared by different stakeholders.

The main objective of the National Capacity Needs Assessment (NCNA) study was to assess and present the capacity requirements of the various Federal and Regional level stakeholders (EPA, NMSA, IBC, different government sectoral ministries and other public institutions, as well as private sector and non-government organizations) involved in the implementation of the obligations and rights included in the various conventions. While the implementation of environmental obligations and rights rests on many federal and regional institutions, EPA is the focal point and the coordinating body for the international conventions regarding the environment and bio-diversity.

The framework followed as preconditions for creating the necessary capacity to effectively implement the obligations and rights under the environmental conventions and to develop practical strategies and actions for sustainable development include:

- Creation of an enabling environment at Federal, Regional and Community levels;
- Empowering local communities to achieve improvements in all environmental matters that could affect their livelihoods.
- Promoting shared responsibility by both international and national institutions to foster environmentally sustainable; and
- Linking individual, institutional and systemic capacity needs.

Environmental sustainability can be achieved only through sustainable development by improving the rural livelihood. Achieving this objective will involve long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, particularly at the local level. (Article 2, UNCCD). Based on these grounds, six thematic areas have been identified in consultation with the Federal institutions including EPA and the Regional Institutions including R-EPAs to provide an additional framework for the implementation of these environmental provisions (as accepted in the workshop) (Box 12). These thematic areas, however, go beyond the mere implementation of specific provisions, but ensure that environmental management and sustainable development efforts are need driven and long lasting.

Box 12. The six thematic areas for Sustainable Development:

1. Mainstreaming and institutionalization of environmental issues and improved access to appropriate information and technical knowledge.
2. Community managed environmental protection for improved livelihoods
3. Rehabilitation of adversely affected ecosystems
4. Capacity enhancement of ecosystems to deliver goods and services
5. Management of adverse impacts of municipal waste
6. Prevention of environmental pollution

3.1. Mainstreaming and Institutionalizing Environmental Issues

Environmental problems are cross cutting issues that impact a wide range of economic, social and political activities. As a result of this and the provisions contained in the international environmental conventions, the Ethiopian Government has gone so far as to legislate the mandatory need for the establishment of environmental units and agencies by all stakeholder public institutions (Environmental Organs Establishment Proclamation, 2002). This was to enable the coordination of environmental activities, the elimination of duplication of effort and the enhancement of the dissemination of environmental information through networking. However, due to the non-existence of the **environmental units**, there is so far no functioning coordination mechanism through which the EPA can effectively influence the public sector development institutions. Partly as a consequence of this, the EPA is presently operating without any meaningful formal or sustained link with these institutions or the other stakeholders (rural communities, private sector, NGOs, CBOs).

Access to **information** is very important for improved environmental protection and management and the promotion of an environmentally sustainable development program. EPA has established the Environmental Information Center (EIC) in 2001 to establish an environmental information system, referral services and data bases, as well as to ensure information exchange. However, the center has yet to establish its own database (including that which would serve the several international conventions), let alone being in a position to provide environmental information to other stakeholders and users. Partly due to the absence of an operational EIC (and the failure of the EIN initiative), information exchange both within and among EPA, the convention focal points and the implementing agencies is not adequate.

There is one environmental analysis **laboratory** under EPA and another laboratory for pesticide formulation and residue analysis within the Crop Protection Department of the Ministry of Agriculture and Rural Development. These laboratories are not accredited reference laboratories. Therefore, there is no reference laboratory for environmental analysis and validation. The analysis results lack comprehensiveness and the validity of the results is questionable. There is no uniform standard method for each parameter in order to ascertain compliance with national and international regulations of hazardous substances in the environment.

Past experience both in the country and outside proved that community-based environmental management and conservation are more successful linking with the development of local communities. However, **community empowerment** to participate in the sustained improvement of the productivity of the individual in pursuit of a livelihood in line with the implementation of the rural development and food security programs has been far from adequate and has provided much less support in fulfilling the national obligations under the respective environmental conventions.

The Ethiopian Government has generally accepted that economic development strategies must be compatible with environmental goals. This requires the incorporation of environmental dimensions into the process of development. It is important to make choices and decisions that will eventually promote sound development by understanding the environment functions.

In spite of the recognition given to the proactive environmental tools for all economic development programs to be compatible with environmental goals, much of the development activities including the land currently under agriculture are deteriorating due to inappropriate planning, implementation and management. Adoption of environmental impact assessments (EIAs) will enable the country's natural resource in an integrated manner, avoiding irreversible environmental damage.

In view of the gaps described above, the capacity needs identified to Mainstream and Institutionalize Environmental Issues to enhance the implementation of environmental obligations and to establish well functioning institutional arrangement 6 strategic goals along with the priority activities and the major stakeholders have identified (Box 13).

Box 13. Strategic goals to Mainstream and Institutionalize Environmental Issues

1. Educate and Train policy makers and experts of line ministries about the Environmental conventions
2. Mainstream environmental issues in all line ministries
3. Train Laboratory and Field monitoring experts.
4. Reinforce and Equip environmental laboratories
5. Improve Environmental Information Exchange system
6. Ensure proactively the integration of environmental issues in all development activities

3.2. Community Managed Environmental Management for Improved Livelihoods

In spite of the high natural resource potential in the country, there is a high incidence of continued food insecurity and extreme poverty. The reasons for the ongoing food and economic crises in Ethiopia are multifaceted: severe and recurrent drought, infrastructure deficiencies, weak input and output markets, population pressure, and degradation of land resources due to nutrient mining and soil erosion because of poor husbandry practices. This is generally applicable to both the crop and livestock sub-sectors, which have contributed, in varying degrees to the degradation of the natural resources through diverse means including deforestation and overgrazing.

Environmental degradation in Ethiopia is proceeding at an alarming pace for the technical and socio-economic reasons cited earlier, but also probably equally, if not more importantly, for the reasons of non-conducive policy and institutional arrangements. The non-conducive institutional arrangements principally relate to the inability or the unwillingness to involve the primary stakeholders (mainly farming and pastoral communities), who are at the frontline of the catastrophic environmental degradation, to have their rightful say in environmental protection and management programs of the country.

Considerable evidences are available why so many land management initiatives in Ethiopia had little positive long-term impact. In this context, it is proposed that appropriate programs and projects that incorporate bottom-up approaches leading to sustainable land management need to be designed to realize the implementation or enforcement of the international environmental conventions.

Regarding the capacity needs required to undertake these, it is first and foremost necessary that the national level stakeholders (EPA and the public sector development organizations) have the requisite willingness, knowledge and skills to:

- fully understand objectives and processes of environmental protection, conservation and management practices of the farming and pastoral communities;
- introduce more advanced, scientific environmental protection and management methods and tools that are community-friendly and capable of upgrading or complementing existing practices;
- motivate and ensure the communities' participation in the planning, implementation and monitoring of environmental programs designed to meet the obligations and other provisions of the international environmental conventions based on government policies and strategies.

Based on the above, the identifiable capacity needs at government and other public institutions level include the following:

1. adequately trained and qualified staff to plan, guide, coordinate and monitor participatory, livelihood-based and community managed environmental management and development programs and projects;
2. institutional arrangements among the stakeholder institutions to share responsibilities and to coordinate activities in community awareness creation, technical training, project planning, implementation and monitoring.

At the community and non-government levels:

1. proper awareness about government environmental policies and strategies, as well as the obligations and rights contained in the international environmental conventions (content, benefits, costs and implications for community livelihoods);

2. technical knowledge about improved environmental protection, conservation and management approaches and methods;
3. technical knowledge about improved and sustainable agricultural management that results in improved community livelihoods;
4. technical knowledge and resources to sustainably conserve and utilize biodiversity resources;
5. technical knowledge and resources to properly manage and utilize water resources
6. proper organizational structures and arrangements to participate in policy formulation, awareness creation, training, project planning, implementation and monitoring.

With the general objective ensuring community-led sustainable environmental management with ecological and economic effectiveness for improved livelihood and enhance the implementation of environmental obligations 6 strategic goals along with the priority activities and the major stakeholders are identified (Box 14).

Box 14. Strategic goals to ensure community-led sustainable environmental management

- Empower communities to develop and run their sustainable development plans through awareness creation and development of bylaws,
- Improve the livelihoods of the communities (Improved food production and productivity)
- Improve livestock productivity and minimize their impact on land degradation by restricting free grazing and introducing cut and carry or stall feeding system.
- Develop new and renewable energy sources
- Promote integrated management of Water resources
- Enhance Biodiversity Conservation

3.3. Rehabilitation of Major Ecosystems of Ethiopia

The rapidly increasing numbers of population and livestock in Ethiopia, where environmental resources are the base on which these economies largely depend, have taken population densities well past the land's carrying capacity at current levels of input and technology. Farmers are thus increasingly being forced to cultivate marginal and fragile areas. Thus environmental degradation has undermined the existence of natural and cultural heritages, critical biodiversity centers (hotspots), economic and socio-cultural values of ecosystems such as forests, rivers, lakes, grasslands, as well as wetlands and mountains. Soil erosion has affected more than three-quarters of cultivable land, drastically reducing its productive potential; and vegetation which is vital for the maintenance of the fragile eco-systems, is being cleared at an alarming rate. Natural heritages are being interfered with to an extent that their existence is being highly threatened.

In view of these problems the general objective of this thematic area is to rehabilitate major ecosystems and maintain their essential characteristics, services, and enhance their productivity in a sustainable manner and have identified 9 strategic goals along with the priority activities and stakeholders involvement (Box 15).

Box 15. Strategic goals to rehabilitate major ecosystems

1. restore wetlands and use wisely in reducing poverty;
2. rehabilitate biodiversity hotspots;
3. restore natural heritages sites and use sustainably
4. protect cultural heritages sites
5. halt and rehabilitate further degradation of rivers in urban centers and industrial zones
6. halt decline of aesthetic, socio-economic and ecological attributes and values of lakes and enhance their productive capacity Percent forest cover increased to fulfill demands for fuel wood, fodder, construction, industrial use, and other forest products;
7. identify and manage protected areas;
8. design and implement Integrated watershed management programs;
9. utilize and manage gum producing woodlands

3.4. Enhancing Goods and Services of the Environment

The comprehensive knowledge on the flora of Ethiopia and the appreciation of the knowledge and the uses associated to plants will have multiple uses. One such use is the selection and propagation of appropriate plant species for planting trees in city parks, on the edges of streets of the cities, major roads and riverbanks. Additional functions of extensive botanical gardens and decoration of street and roadside and riverbank with trees is their role as carbon sink thus cleaning the air and reducing the green house effect. The trees on the edges of riverbanks and rural roads will abate the soil erosion that could develop into large gullies and finally shortening the lifespan of the roads. Long lasting roads ensure the communication network, which is vital for development.

While Botanical Gardens can have multiple purposes such being center of research, source of propagules, center for *ex-situ* conservation, City Green Areas can supplement the objective of Botanical Gardens but mainly serve decorative and recreation purposes. As such Green Areas and City Parks do not need specialized care and can be handled by private investors. Individuals can be encouraged to be involved in Garden Areas City and Park business to earn income by charging affordable price for recreation such wedding ceremonies, weekend recreations and a variety of entertainments.

Enhancing Goods and Services of the Environment considers 10 strategic goals all of which are directly or indirectly related to ex-situ conservation of botanical resources in botanical gardens which will contribute to conservation of biodiversity and development of green areas and city parks which will contribute to sequestration of carbon thus contributing to reducing global warming up (Box 16). Reclamation of quarries, abandoned irrigation infrastructures also involve using plant resources. Thus the strategic goals and activities are proposed to meet Ethiopia's obligation of the agreements of the Rio conventions and therefore qualify for the rights and benefits of acceding to the convention. Benefits would be obtained through multilateral or

bilateral international support and through the Cleaner Development Mechanisms (CDM) of the Kyoto Protocol. City councils and Federal and Regional governments are the main actors with full participation of the communities.

The success of the theme and its strategic goals relies on community participation, international support and commitment of the regional governments and city councils to development and appreciation of scenic beauty and environmental and public health.

Box 16. Strategic Goals to Enhancing Goods and Services of the Environment

1. establishing botanical gardens or city parks in each region
2. establishing urban residential green areas
3. Establishing City Parks
4. plating tress on the edges of streets, rural roads and on the edges of rivers in each region
5. identifying and rehabilitating abandoned quarry sites
6. identifying and reclaim water bodies invaded by alien invasive species by each region
7. identifying and reclaiming lands invaded by alien invasive species by each region
8. identifying and reclaiming previously public owned and abandoned state farms by each region
9. identifying and reclaiming non-operational irrigation infrastructures
10. identifying and managing affected water reservoir sites

3.5. Managing Adverse Impacts of Municipal Waste

The strategy to manage the adverse impact of municipal waste is to move away from fragmented and uncoordinated waste management to integrated waste management. Such a holistic and integrated management approach extends over the entire waste cycle from cradle to grave, and covers the prevention, efficiency in material utilization, resource recovery, generation, collection, transportation, treatment and final disposal of waste. Integrated waste management thus represents a paradigm shift in approach to waste management, by moving away from waste management through impact management and establishing instead a waste management system, which focuses on waste prevention and waste minimization. This is a requirement for the implementation of the Multilateral International Environmental Agreements (MIEAs) that are ratified by Ethiopia. To prevent the adverse impact of municipal waste, 14 strategic goals were identified (Box 21).

Box 17. Strategic goals to prevent the adverse impact of municipal waste

- Segregate, store, reuse or recycle and dispose of municipal solid wastes emanating from residential houses
- Manufacture containers and wrappers from recyclable or biodegradable materials
- *Recyclable cans and glass bottles* taken back by the concerned manufacturers, reused, recycled or disposed of
- *Recyclable* plastic containers taken back by the concerned manufacturers, reused, recycled or disposed of
- Use of refillable printer inks by all government offices,
- Use of recycled paper by government offices
- Use of recyclable plastics by government and non government offices
- Collection, treatment and safe disposal of Medical wastes
- (Treatment to render the waste non-infectious and segregation to prevent exposure)
- Obligatory use of construction debris for refilling of excavated or quarry by construction agencies
- Establishment of municipal solid waste landfill sites and upgrading of existing waste disposal sites to acceptable level
- Establish joint municipal solid waste landfill sites
- Utilization of used oils and tires as energy source for cement and other industries
- Private enterprises engage in producing commodities minimize waste

Each strategic goals aim to reduce both the generation and the environmental impact of waste under different category. The strategic goals present the way forward for ensuring that uncontrolled and uncoordinated waste management no longer adversely affects the socio-economic development of Ethiopia, the health of its people, and the quality of its environmental resources. The goals envisages a waste management system that concentrates on avoiding, preventing and minimizing waste and makes provision for waste management services for all by extending an acceptable standard of waste collection, as well as transportation, treatment and disposal services to all Chartered, regional, and zonal cities/towns in Ethiopia in 10 years. The strategic goals are prioritized based on the scale of the problems, level of concern and ability to adequately address the issue. The target levels to be achieved by each region and institution are mostly in terms of percentage, but the actual volume of activity may vary from one region to the other.

While the long-term objective of the strategy is waste prevention and minimization, a number of premeditative actions such as improved waste collection, waste treatment and waste disposal are required in the shorter term due to prevailing inadequate waste management practices in Ethiopia

3.6. Prevention of Environmental Pollution

This thematic area presented, in the form of broad strategic goals and supporting objectives, the priorities for achieving the vision of environmental pollution prevention over the next ten years. The intention is to move from a previous situation of fragmented and uncoordinated pollution control

efforts to integrated pollution prevention and control approach. The 10-year plan is designed in an integrated manner while placing strong emphasis on building capacity at the Federal, Regional, and Zonal levels. Within the framework of integrated pollution prevention and control, nine strategic goals are identified. The strategic goals present the way forward for ensuring that the socio-economic development of Ethiopia, the health of its people, and the quality of its environmental resources are no longer adversely affected by uncontrolled release of pollutants to the receiving environment.

These goals are in most cases interdependent in terms of the capacity needs and implementation must address the cross cutting issues to be effective. It is vital to recognize that environmental concerns and issues cut across various sectors and functions. Therefore, integrated pollution prevention and control depends on cooperation and initiatives from all sectors of society. The stakeholder analysis address functions of the Federal EPA and Regional Governments, as well as functions of other government institutions that impact on pollution and will require their cooperation and commitment for effective implementation.

The major issues that are addressed in relation to each strategic goal are effective institutional framework and legislation, pollution prevention, holistic and integrated planning, participation and partnerships, empowerment and environmental education, generation and management of environmental information, and international cooperation. The capacity need assessment process identified a number of issues relevant to the three receiving environment, i.e. water, air and land, as well as waste as a major source of pollution in the Ethiopian context. All pollution-generating activities, including those found in the energy, agriculture, consumer, as well as industrial sectors were considered. The key water pollution issues are salinity of fresh waters, enrichment of fresh water bodies by plant nutrients, microbiological quality of water, sediment and silt migration, harmful inorganic and organic compounds, and diffuse water pollution. Basin-wide approach was adopted in this regard. The key air pollution issues considered for the ten-year plan are vehicle emissions, industrial emissions, and ozone depleting substances. Whereas the key land pollution issues are related to agricultural practices, waste treatment and disposal, repair shops and scrap yards, service stations and other processing industries. While the long-term objective of the strategy is pollution prevention, a number of remedial actions such as wastewater treatment and rehabilitation programs are required in the shorter term due to prevailing pollution problem in Ethiopia.

The strategic goals are prioritized based on the scale of the problems, level of concern and ability to adequately address the issue. The target levels to be achieved by each region and institution are expressed mostly in terms of percentage, but the actual volume of activity may vary from one region to the other.

To achieve the thematic area, 9 strategic goals are identified (Box 22). The priority activities with their associated capacity requirements are also identified. In addition, institutional changes and new legislative requirements are suggested and capacity building requirements were addressed at individual, institutional, and systemic levels. Attention was also given to raising public awareness on pollution prevention issues and promoting and delivering environmental education. The implementation of the priority activities will entail the development of detailed action plans and proposals by the implementing institutions and regulatory bodies.

Box 18. Strategic goals to prevent environmental pollution

- Existing industrial enterprises develop environmental management systems, EMS, to comply with pollution control laws
- Existing commercial agricultural enterprises develop EMSs, to enable proper functioning of farm surrounding ecosystems and to protect human health
- Existing hydropower enterprises develop their environmental management systems ...
- Protection of targeted river basins and lakes/reservoirs from point and non-point source physico-chemical and microbial pollution
- Incorporate environmentally sustainable transportation system into urban and regional planning
- Phase out the consumption of ozone depleting substances and use of ozone depleting substances-based equipment
- Establish environmentally sound management of industrial wastes and develop disposal facilities in each industry
- Clean up all sites contaminated by persistent organic pollutants by
- Establish national environmental pollution monitoring programs

IV. Summary of Action Plan

Consistent with the capacity needs assessment, the preparation of the capacity building action plan uses the six thematic areas and the respective strategic goals as a basis, around which the overall and specific objectives are formulated. The action plan part of the report presents the actual capacity building action plan which shows the strategic goals, priority capacity building activities, the time frame for activity implementation, the achievement indicators and the estimated budget requirement for each activity.

The approach adopted has been to establish the framework and to identify the capacity needs and financial resources required to implementing the priority activities. It is recognized that it is not possible at this stage to present definitive figures, but rather to use indicative numbers to assist in the categorization of the activities. Cost estimates are only order of magnitude estimates based on the information available at the present and professional judgments. Resource requirements should be investigated in greater detail during the development of the specific projects and plans under the priority activities. Summaries of the action plans along with the regional distribution and estimated budget are presented in the following tables.

The activities and the financial resources presented under each thematic area, however, go beyond the capacity building aspect of mere implementation of specific provisions. As capacity building with out implementation activities on the ground does not ensure sustainable environmental management and development efforts, the implementation part of the strategic goals are also indicated along with the estimated cost requirements that are need driven and long lasting. As a result the budget seems too high. Financial requirements for capacity building and for the implementation part are estimated separately as financial source are separate. In this regard EPA should concentrate on the capacity building components of the action plan while the respective ministries and institutions should address the implementation part, which is a long-term commitment.

The success of the strategic goals relies heavily on community participation, which could be realized through relentless awareness creation and the economic incentives, which can accrue. It also heavily relies that support would be obtained from the developed country parties according to the commitments made to combat desertification, conservation of biodiversity, halt and ameliorate climate change and prevent deterioration of the stratosphere. It is also assumed that the government and the communities concerned would chip in matching funds to the development efforts either in cash or in kind and personnel necessary for execution of the strategic goals would be provided by the government.

4.1. Mainstreaming and Institutionalizing Environmental Issues

Strategic Goals	Priority Activities	Regions												Federal Institutions			Total	Budget (USD Total)	
		O R M	A M H		T G R	A F R	S M L	B S G	G M B	H A R	A A	D		E P A	IB C	MoA R D		CB ⁷	IMP ⁸
Educate and Train policy makers and experts about the Environmental conventions	Prepare awareness creation manual for Policy makers			1										1			1	20,000	
	Provide awareness creation workshop for policy makers (60*3 days)			1										1			1	30,000	
	Prepare training manual for technical experts			1										1			1	20,000	
	Provide training for experts (60*10 days)			60										60			60	30,000	
	Arrange experience sharing tours for experts (80 * 7 days)			60										60			60	40,000	
Mainstream environmental issues in all line ministries⁹	Review all relevant policies and laws for their impacts on environmental sustainability and make the necessary amendments	1	1	1	1	1	1	1	1	1	1	1	1	1		1	12	24,000	
	Develop a monitoring and evaluation system for all relevant sector institutions,	1	1	1	1	1	1	1	1	1	1	1	1	1		1	12	25,000	

⁷ Financial Resources for Capacity Building.

⁸ Financial resources for the implementation of the development activities to be separately solicited by the respective sector institutions.

⁹ All sector institutions will streamline environmental issues and establish environmental units following the strategic goal No1.

Strategic Goals	Priority Activities	Regions											Federal Institutions			Total	Budget (USD Total)	
		O R M	A M H		T G R	A F R	S M L	B S G	G M B	H A R	A A	D D	E P A	I B C	M o A R D		CB ⁷	IMP ⁸
	Establish and equip environmental units in all sector institutions	1	1	1	1	1	1	1	1	1	1	1	1		1	12	48,000	
Reinforce and Equip environmental laboratories	Assess the two labs (EPA and PPD) for technical efficiency, available analytical methods, and facilities against international standards												1		1	2	10,000	
	Identify the critical gaps and prioritize in each laboratory to undertake proper lab analysis,												1		5	2	10,000	
	Purchase laboratory and field equipment												1			2	100,000	
	Develop accredited laboratory standards for major activities.												1			2	50,000	
	Train laboratory and field technicians.												5			10	30,000	

Improve Environmental Information Exchange system ¹⁰	Establish and maintain a national Environmental Information Network													1		1	250,000	
	Establish and strengthen a national Environmental Information and Documentation system													1		1	30,000	
	Standardize data collection and documentation													1		1	10,000	
Ensure proactively the integration of environmental issues in all development activities ¹¹	Develop sector specific EIA guideline													1		1	50,000	
	Make EIA studies mandatory in all development programs and projects													1		1	50,000	
	Develop standard system for environment auditing, monitoring and regulating (including GMOs) and implement it.													1		1	100,000	
	Training EIA experts (28*3 months)	4	3	3	2	2	2	2	2	1	3	1		3		28	30,000	
TOTAL																	975,000	

¹⁰ All sector institutions would be connected following the strategic goal No1.

¹¹ It includes the formulation and implementation of legal frameworks, environmental standards, EIA guidelines, Environmental auditing tools (Environmental management tools) for Agri, Tourism & Hotel, Industries, health care, Mining, Roads, Dvt of natural resources, Real estate dvt.

4.2. Community-led Environmental Protection for Improved Livelihood

Strategic Goals	Priority Activities	Regions											Federal Inst			TOTAL	BUDGET (USD)	
		OR M	AM H	SN NP	TGR	AFR	S M L	BSG	G MB	HA R	A A	D D	EP A	IB C	MA RD		CB	IMP
Empower communities																		
1.1) Awareness Creation	Prepare training manual												1			1	12,000	
	Conduct ToT to Regions (3-5 from every region)												1			1	70,000	
	Adapt the training manual to the local condition	1	1	1	1	1	1	1	1	1	1	1				12	30,000	
	Train Animators (3 per Wereda for 10 days)	621	312	279	105	105	24	120	87	9	84	3				1752	600,000	
	Train local communities ¹²	621	312	279	105	105	24	120	88	9	85	3				1752	600,000	
	Monitoring and evaluation	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		Continuous process	30,000

¹² Local Communities vary in size, composition, structure and organization. Sometimes they are defined by administrative boundaries, while other communities emerge from a shared culture and history. In all cases, they reflect in some way the neighborhoods where people live. A local community, as generally understood, includes but is not limited to the local government authority. School, business, cultural, religious and sporting communities all make vital contributions to the social capital and healthy functioning of a local community.

1.2) Develop bylaws on "commu- nity-led environm- ental protectio- n and sustainab- le develop- ment"	Prepare sample bylaw (key elements)													1		1	15,000	
	Identify interim committee from every community	1	1	1	1	1	1	1	1	1	1	1	1			12	10,000	
	Adapt the sample bylaw to local Condition	1	1	1	1	1	1	1	1	1	1	1	1			12	10,000	
	Discussion forum with in the community	621	312	279	105	105	24	120	88	9	85	3	621			1752	50,000	
	Enforce the bylaw	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦			Continuo us process	50,000	
2) Improve the livelihoods of the communities through a sustainable land use																		
2.1) Improve crop productio- n and productiv- ity	Study and assess the problems of traditional farming practices (location specific)	621	312	279	105	105	24	120	88	9	85	3				1752		175,500

Demonstrate and evaluate technologies under On-farm condition (social & economical)	621	312	279	105	105	24	120	88	9	85	3				1752		3,51000
Train farmers to bring behavioral change to sustainable land management (Awareness, Knowledge, attitude practices)	621	312	279	105	105	24	120	88	9	85	3				1752		175,500
Develop operational local-level technology multiplication provisions	621	312	279	105	105	24	120	88	9	85	3				1752		175,500
Demonstrate best practices at field levels	621	312	279	105	105	24	120	88	9	85	3				1752		175,500
Document and share lessons learnt and best practices	621	312	279	105	105	24	120	88	9	85	3				1752		87,750

2.2) Production organic fertilizer	Prepare a comprehensive and illustrative manual and adapt to local conditions (12)												1				1		12,000
	Identify compost making materials at local conditions (12)	1	1	1	1	1	1	1	1	1	1	1					12		12,000
	Demonstrate best practices at field levels (585)	621	312	279	105	105	24	120	88	9	85	3					1752		585,000
	Document and share lessons learnt and best practices	621	312	279	105	105	24	120	88	9	85	3					1752		30,000
	Scale-up best practices	621	312	279	105	105	24	120	88	9	85	3					1752		100,000
2.3) Establish community seed banks and food storage facilities and store food for	Study the socio-economic status of the community (12)	621	312	279	105	105	24	120	88	9	85	3					1752		12,000
	Design appropriate storage facilities (12)	621	312	279	105	105	24	120	88	9	85	3					1752		12,000

bad years and for the market	Construct stores (585)	621	312	279	105	105	24	120	88	9	85	3				1752		585,000
	Develop bylaws and popularize the enforcement mechanisms	1	1	1	1	1	1	1	1	1	1	1				12		12,000
	Train technicians and implement activities	621	312	279	105	105	24	120	88	9	85	3				1752		100,000
3) Improve livestock productivity and minimize their impact on land degradation																		
	Establish and manage Animal feed	621	312	279	105	105	24	120	88	9	85	3				1752		1,779,000
	Restrict free grazing	621	312	279	105	105	24	120	88	9	85	3				1752		375,000
Development of new and renewable energy sources																		
	Establish and manage Protected areas	621	312	279	105	105	24	120	88	9	85	3				1752		187,500
	Establish and manage Woody biomass	621	312	279	105	105	24	120	88	9	85	3				1752		714,000
	Establish and manage Biogas energy	621	312	279	105	105	24	120	88	9	85	3				1752		655,500
	Establish and manage Solar energy	621	312	279	105	105	24	120	88	9	85	3				1752		190,500

Integrated management of Water resources																		
	Construct water supply systems for household	621	312	279	105	105	24	120	88	9	85	3				1752		760,500
	Construct water supply systems for livestock uses	621	312	279	105	105	24	120	88	9	85	3				1752		242,000
	Develop small scale Irrigation	621	312	279	105	105	24	120	88	9	85	3				1752		6,066,000
Biodiversity Conservation																		
	Establish <i>In situ</i> sites	3	2	2	1	1	1	1	1					12		12		162,000
	Establish Field gene banks	3	2	2	1	1	1	1	1					12		12		80,000
	Establish Molecular characterizati on and tissue labs													1		1		6,066,000
TOTAL																	1,477,000	19,878,750

4.3. Rehabilitation of Major Ecosystems in Ethiopia

Strategic Goals ¹³	Regions									Total	Budget CB (in '000)	Budget IMP (in '000)
	AA	AFR	AMH	BSG	GMB	ORM	SML	SNNP	TGR			
Wetlands restored and wisely used and thus contribute in reducing poverty ¹⁴	-	3	10	5	3	10	-	10	2	43	----	86,000.0
Key Biodiversity Areas rehabilitated and their contribution to the protection and sustainable use of biodiversity hotspots ascertained ¹⁵	-	3	5	2	2	7	5	5	3	32	----	160,000.0

¹³ Each thematic area is supposed to be developed into a project later depending on the specific area in consultation with community.

¹⁴ Each wetland will cost in average \$ 2,000,000.00

¹⁵ Each key biodiversity area will require in average \$ 5,000,000 to rehabilitate

Strategic Goals ¹³	Regions									Total	Budget CB (in '000)	Budget IMP (in '000)
	AA	AFR	AMH	BSG	GMB	ORM	SML	SNNP	TGR			
Natural Heritages sites restored and sustainably used ¹⁶	2	3	5	2	2	10	5	5	2	36	----	72,000.0
Cultural Heritages sites protected	2	3	10	5	3	10	5	10	10	58	7,645.0	43,405.0
Degradation of rivers in urban centres and industrial zones halted and rehabilitated ¹⁷	10	3	10	3	3	20	3	10	4	66	----	330,000.0

¹⁶ Each Natural Heritage site will cost in average \$2,000,000.00 to restore

¹⁷ Rivers in regional and some zonal capitals selected for rehabilitation will cost \$ 5,000,000 for rehabilitation

Strategic Goals ¹³	Regions									Total	Budget CB (in '000)	Budget IMP (in '000)
	AA	AFR	AMH	BSG	GMB	ORM	SML	SNNP	TGR			
Decline of aesthetic, socio-economic and ecological attributes and values of lakes halted and their productive capacity enhanced ¹⁸	-	3	3	-	-	7	-	5	1	19	3,278.25	186,721.75
Percent forest cover increased to fulfill demands for fuel wood, fodder, construction, industrial use, and other forest products ^{19,20}	5190	952,420	1,534,430	488,890	256,490	3,554,230	2,780,730	1,172,630	564,510	11,309,520	10.0	17,797,332.0

¹⁸ Each degraded lake will require \$ 10,000,000 to rehabilitate

¹⁹ Each region will assign 10% of its land surface for conservation and fuel wood, construction and other forest uses and developing a forest of indigenous and exotic species

²⁰ Each ha of forest will cost \$ 800.00 (each tree is planted at 5 m interval and there will be 400 tree per ha and tree will cost only \$2.00)

Sites identified, rehabilitated and managed as protected areas	-	3	3	2	2	5	2	5	2	24	26,460.0	213,540.0
Integrated watershed management programmes designed and implemented ²¹	-	3	20	3	3	20	4	20	10	83	36,900.0	1,208,100.0
Gum producing woodlands are sustainably used ²²	-	-	2	-	3	5	5	2	5	22	2,000.0	131,700.0
TOTAL	-		-	-	-	-	-	-	-	-	76,293.25	20,228,798.75

²¹ Each watershed will cost \$ 15,000,000 to manage in an integrated manner

²² Each gum producing woodland will cost \$ 6,077,172.7 to rehabilitate and manage in a sustainable manner

4.4. Enhancing the goods and services of the environment

Strategic Goals ²³	Regions										TOT AL	Budget CB (in '000)	Budget IMP (in '000)
	AA	AFR	AMH	BSG	GMB	ORM	SML	SNNP	TGR	HAR			
City parks established in Regional and Federal cities	* ²⁴	*	*	*	*	*	*	*	*	*		----	359,000.0
Each region sets a target for establishing a botanical garden in each Zonal City and implements its target	1 ²⁵	2	10	3	2	14	3	18	4	1	58	-----	349,000.0
Urban residential green areas established	30 ²⁶	18	307	60	24	564	24	279	105	9	1420	20.0	300,250.0
Each City Establishes City Parks	10 ²⁷	6	99	20	8	188	8	93	35	3	470	----	284,000.0
Each region sets a target for planting trees on the edges of rural roads and meets its target	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	135.0	11,125.0
Each major regional city sets its respective target for planting trees on the edges of rivers and meets its target	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	210.0	12,375.0
The appropriate federal institution set targets to plant appropriate plant species on the edges of trans-regional roads and meet its target	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	2,520.0	12,625.0

²³ Each strategic Goal is supposed to be developed into a project later depending the specific area in consultation with community.

²⁴ The number of city parks depends on the number of weredas in each city. For the moment one city park for each wereda of a city is a reasonable estimate.

²⁵ Each zone will establish a ten ha botanical with the exception of the Harari Region which will have only one botanical garden. Each botanical garden will cost ca. USD five million (\$ 5,000,000.00).

²⁶ Each city will establish three residential green areas and each green area costs \$ 250,000.00

²⁷ A city is understood as the wereda capital (Addis Ababa is considered as a Region) and each city park will cost \$ 605,255.00

Strategic Goals ²³	Regions										TOT AL	Budget CB (in '000)	Budget IMP (in '000)
	AA	AFR	AMH	BSG	GMB	ORM	SML	SNNP	TGR	HAR			
Each region sets a target to identify and rehabilitate abandoned quarry sites and meets its target	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	450.0	22,765,000
Each region sets a target to identify and reclaim water bodies invaded by alien invasive species and meets its target	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	100 %	2,450.0	2,500,000
Each region sets a target to identify and reclaim lands invaded by alien invasive species and meets its target	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	100 %	3,000.0	12,000,000
Each region identifies the previously public owned and abandoned state farms, sets target to reclaim them and meets its target	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	----	1,325,000
Federal and Regional city streets bordered by trees	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	260.0	16,625,000
Abandoned quarry sites in regional and federal cities identified and rehabilitated	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	250.0	15,375,000
Each region identifies non-operational irrigation infrastructures and sets target to reclaim such infrastructures for environmentally sound use	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	3,000.0	5,525,000
Degraded water reservoir sites identified and managed wisely	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	825.0	5,125,000
TOTAL												13,120.0	1,409,615,000

4.5 Manage the adverse impact of municipal waste

Strategic Goals ²⁸	Region/Institute ²⁹											Federal Institutions	Budget	
	AA ³⁰	AFR	AMH	BSG	GMB	ORM	SML	SNN	TGR	DD	HAR		CB (in '000)	IMP (in '000)
Segregate, store, reuse or recycle and dispose 70 percent of municipal solid wastes emanating from residential houses	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	380.0	8,000.0
Manufacture containers and wrappers from recyclable or biodegradable materials	1	-	1	-	-	2	-	1	1	1	-	×	40,050.0	60,100.0
<i>Recyclable cans and glass bottles</i> taken back by the concerned manufacturers, reused, recycled or disposed of	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	350.0	-
<i>Recyclable plastic containers</i> taken back by the concerned manufacturers, reused, recycled or disposed of	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	×	50,080.0	60,100.0
<i>Use of refillable printer inks by all government offices,</i>	70%	2	10	3	2	12	3	18	5	70%	70%	×	1,230.0	-
Use of recycled paper by government offices	50%	2	10	3	2	12	3	18	5	50%	50%	×	70.0	50,000.0
Use of recyclable plastics by government and non government offices	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	×	110.0	-
³¹ Collection, treatment and safe disposal of Medical wastes (Treatment to render the waste non-infectious and segregation to prevent exposure)	1	1	1	1	1	2	1	2	1	1	1	×	220.0	40,010.0

²⁸ Prioritization of the implementation of each activity under the strategic goals may vary from region to region

²⁹ It is considered that the 10 years plan will cover all regional and zonal cities/towns except Addis Ababa

³⁰ In Addis Ababa City Government, it is considered that all zones, woredas and kebeles should be covered

³¹ It is assumed that each chartered, and regional city/town would have at least one incinerator. But the size and type of the incinerator may vary.

Obligatory use of construction debris for refilling of excavated or quarry by construction agencies	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	50.0	420.0
³² Establishment of municipal solid waste landfill sites and upgrading of existing waste disposal sites to acceptable level	2	2	10	3	2	12	3	18	5	1	2	×	250.0	600,070.0
Establish joint municipal solid waste landfill sites														
Utilization of used oils and tires as energy source for cement and other industries	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	×	280.0	2,080.0
Private enterprises engage in producing commodities minimize waste generation	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	1,200.0	350.0
Mange the impact of hazardous waste	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	×	10,260.0	20,720.0
Reuse, recycle and dispose municipal wastewater	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	120.0	210,300.0
Sub total													104,650.0	1,201,940.0
Total														1,306,590.0

³² It is assumed that each chartered, regional and zonal city/town would have at least one landfill site. But the size of the landfill may depend on the amount of waste to be disposed of.

4.6. Prevention of environmental pollution

Strategic Goals	Region/Institute											Federal Institutions	Budget (USD)	
	AA	AFR	AMH	BSG	GMB	ORM	SML	SNN	TGR	DD	HAR		CB (in '000)	IMP (in '000)
Existing industrial enterprises develop environmental management systems, EMS, to comply with pollution control laws	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	400,270.0	200.0
Existing commercial agricultural enterprises develop EMSs, to enable proper functioning of farm surrounding ecosystems and to protect human health	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	10,280.0	10,000.0
Existing hydropower enterprises develop their environmental management systems	-	-	70%	-	-	70%	-	70%	70%	-	-	×	240.0	2,060.0
Protection of targeted river basins and lakes/reservoirs from point and non-point source physico-chemical and microbial pollution	1 ³³	1	1	1	1	4	-	1	2	-	-	×	1,540.0	805,300.0
	3 ³⁴	-	2	-	-	7	-	2	-	-	1	×	370.0	6,050.0
Incorporate environmentally sustainable transportation system into urban and regional planning	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	×		
Phase out the consumption of ozone depleting substances and use of ozone depleting substances-based equipment	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	×	180.0	210.0

³³ Number of river basins

³⁴ Number of lakes

Establish environmentally sound management of industrial wastes and develop disposal facilities in each industry	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	×	20,320.0	21,160.0
Clean up all sites contaminated by persistent organic pollutants	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	×	180.0	1,360.0
Establish national environmental pollution monitoring programs	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	×	-	50,320.0
Sub total														433,380.0	896,660.0
Total														1,330,040.0	

V. Monitoring and Evaluating the Implementation of a National Strategy/Action Plan

An important aspect of implementing a strategy based on the NCSA involves continuously monitoring the progress in implementing activities (e.g. against the planned schedule or budget). Monitoring the implementation of activities can be based on three fundamental steps: measuring progress (in implementing activities); analyzing the situation (to determine the cause of any positive or negative deviations from the plan); and determining necessary action (to remedy the situation where necessary).

Evaluating the impact of the strategy, i.e. ascertaining the degree of success in achieving the goal and objectives of the strategy, is also important. Evaluation can provide insight into what lessons can be learned to guide future efforts.

In order to effectively carry out monitoring and evaluation activities properly EPA should give priority to establishing a Management Information System (MIS) in which information and data collected should be gender and age disaggregated.

It is also necessary for EPA to prepare annual action plans together with the stakeholders for every strategic issue in order to run an effective monitoring and evaluation system. Such annual action plans should be prepared with the full participation of the stakeholders and should:

- Identify key result areas
- Set indicators
- Clearly set who is doing what
- Assign budgets

Monitoring and evaluation of the NCSA project should be carried out using the following:

- Review of progress reports
 - Reports from every project site (monthly, quarterly and annually)
 - Reports from every sector office including on performance of external technical assistance, if any (quarterly and annually)
 - Reports by EPA including on performance of external technical assistance, if any (quarterly and annually)
- Field Visits
 - Field visits by EPA professionals from AA (quarterly)
 - Visits by the Inter-Institutional Committees (annually, but on a staggered schedule)
- External Evaluation
 - External and independent professionals should carry out annual, including Mid-term and project-completion, evaluations (including external TA, if any).
- Workshops and Meetings
 - Annual workshop of all stakeholders.
 - Regular (quarterly) meeting of Inter-Institutional Committee.