



Environment and Natural Resources as a Core Asset for Wealth Creation, Poverty Reduction, and Sustainable Development in Eritrea

Seife M. Berhe PhD
September 2007



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EXECUTIVE SUMMARY

I. BACKGROUND OF THE STUDY

Land degradation and desertification are the most serious and widespread problems facing Eritrea and the IGAD region. Hence the purpose of the study is to understand the extent to which environmental assets (goods and services) are important to livelihoods of people in the IGAD region and the extent to which such values are integrated into macro-economic planning (PRSPs) and so support national and regional delivery on the MDGs.

II. ENVIRONMENTAL AND NATURAL RESOURCE AS KEY ASSETS FOR RURAL ECONOMIC GROWTH AND LIVELIHOOD IMPROVEMENT

A study done in Gash Barka area in western Eritrea has shown that:

- The riverine forest generate more value per capita for the local population than any other form of land use;
- The riverine forest of Eritrea form also an essential component of the traditional livestock production as they provide fodder and/or browse and shelter during the dry season.
- The riverine forest provides ecological goods and services;
- Large proportion of the households (45% in Barka and 59% in Gash) are dependent on forest resources for their livelihoods, which is in the range 15 – 30% of their total income.

The main Policy and Legal Incentives for protecting Natural resources and the environment are the:

Transitional Economic Growth and Poverty Reduction Strategy paper (**TEGPRS**), lays out the government's policies for macroeconomic management,

I-PRSP is anchored mainly on restoring economic growth, while maintaining macro-economic stability and raising Income of the poor segments of the population and putting in place the enabling environment.

The **Food Security Strategy** which is based on improving agricultural productivity and marketing of agricultural output; enhancing national capacity to import food, including keeping a strategic reserve, and using international food assistance more efficiently.

Food Aid policy is based on Legal Notice 26/96 – Food Monetization Policy in 1996, which would make Eritrea less dependent on foreign aid.

The aim of the **Medium Term Agricultural Sector Development Plan** is to achieve food security by identifying potential areas and deploying resources in a co-ordinated fashion.

The aim of the **Energy Sector Development Plan** is to increase alternative energy resources.

The **ECMIB** has adopted the integrated coastal zone management approach, which can be used as a platform to mainstream poverty reduction strategy.

The perverse incentives (policy, law, markets) that hinder progress are:

- Lack of an umbrella **Environmental Law and Sectoral legislation;**

- Government's inability to **enforce laws** governing use of, and access to land and/ or natural resources can lead to widespread exploitation of Natural Resources.
- An **Agricultural Development Policy** that focuses mainly on increasing the production of goods without addressing the sustainability of the resources;
- **Transforming** naturally rich range vegetation to cultivated farms and farming into marginal areas and/or farming along the banks of major rivers of Gash Barka;
- Eritrea does not have land use planning regulatory framework.
- The new **land proclamation** (Law No.58/1994) has not been implemented fully;
- The border **conflict** with Ethiopia is also one of the major barriers that prevent people from being able to benefit from their natural resource assets on a sustainable manner.

III. NATURAL RESOURCE GOVERNANCE AT THE CORE OF SUSTAINABLE DEVELOPMENT AND LIVELIHOOD IMPROVEMENT

Natural Resources Governance, Devolution and Rights and Gender

The Proclamation for the Establishment of Regional Administrations (No. 86/1996) and the Land Reform Proclamation No. 58/1994 provides the necessary legal basis for implementing decentralized governance of natural resources.

Insecurity of land tenure in rural areas in Eritrea prevents people from investing in long-term activities, which may contribute to the protection of the environment and natural resources.

The Land Proclamation 58/1994, has solved the gender discrimination, because traditional land tenure system had discriminated women's right in land use.

Extent of policy and legal implementation:

- Not many of the Line Ministries had given emphasis to environmental issues;
- There is as such no policy or laws that hinder local communities, however, there are a lot of modalities and market access that need to be made available for poor people;
- The rural communities are adequately informed about their rights and responsibilities, however modern methods of Governance structures have being introduced without proper technical and financial support.

IV. RURAL PEOPLE AND COMMUNITIES BEING ABLE TO PROCESS AND VALUE ADD ON NATURAL RESOURCE PRODUCTS AND CAN FAIRLY AND EQUITABLY ENTER THE MARKET PLACE

Rural people can engage better in the market to increase their income from natural resources by:

- **Creating access to markets** through community empowerment, resource development and market linkages to enhance the income of small-scale producers; through improvements in production, value add processing, and marketing;
- Local and Regional Procurement (LRP) of Food Aid by international agencies such as the WFP could improve the marketing of staple foods and stabilising prices;
- Value-chain production, is required in which raw materials are processed according to a series of discrete value added steps.

Policy and structural impediments:

- Policies and development programmes to help farmers will always be limited without parallel support to marketing;

- There is no efficient grain marketing board, which assures sustainable pricing for the farmers.

Value-adding on natural resource based products:

The Government has made several attempts to Value Add on Natural Resources. Few case studies are presented below:

Fisheries: Value-added processing of fish and other marine resources in order to get foreign exchange by:

Sustainable use of natural resources / agricultural income:

- Increasing land under cultivation** by providing infrastructure, essential services, access to credit and farm inputs, and secure rights of tenure to individuals and groups.
- Encouraging production of high-value commodities for export** and to produce goods that can be used as raw materials for industry and high-value cash crops.
- Accelerated and sustainable **afforestation program** by encouraging communities to establish woodlots on community lands.
- Marketing co-operatives for **Gum Arabic and Incense Plantations**.
- Value adding of livestock production in Eritrea** through production diversification, quality improvement and enhancing market opportunities for various animal products.

V. ENVIRONMENT AND NATURAL RESOURCES IN NATIONAL ACCOUNTING, PRSP's AND MDG PERFORMANCE

Natural resources and national accounting, and other measures of national growth

Due to lack of data very little empirical work on Natural Resources Accounting (NRA) can be presented about the Eritrean natural resources and environmental issue.

Indicators or means to measure the value of the environment and natural resources

The Ministry of Land, Water and Environment is in charge of preparing, in collaboration with all stakeholders indicators that measure the value of the environment and natural resources.

Natural resource assets reflected in national and regional marketing and trade

Since there is lack of capacity in accurately assessing the value of natural resources and costs of environmental protection measures it has not been possible to accurately reflect natural resources in national and regional marketing and trade.

Use of Strategic Environment Assessment (SEA)

So far no SEA has been carried out of major resettlement programs as well as cement factories. However all mineral exploration companies are by law required to carry out SEIA, before the granting of mining licences.

VI. ANALYSIS OF THE IMPORTANT EMERGING ISSUES WITH RESPECT TO THE ENVIRONMENT AND NATURAL RESOURCES

The key emerging issues in Eritrea are the following:-

Invasive Species

The fragile and degraded ecology of much of the landscape provides great opportunities for alien invasive plant species such as *Prosopis chiliensis*, to establish themselves and spread.

Climate Change and Adaptation

As identified by the INC and NAPA studies, the groups that are most vulnerable to climate risks are those that directly depend upon natural resources for their livelihood. These are: subsistence farmers, rural dwellers, pastoralists, urban poor, fishermen and island residents

Genetically Modified Organisms (GMOs)

Though GMOs do not pose immediate significant threat, nevertheless Eritrea has drafted a National Biosafety Framework, to put biotechnology and biosafety regulatory mechanism in place to enable it check and control the safe transfer, handling and use of the products of Biotechnology.

Carbon Trade

Traditional stoves, "Mogogo" have been improved to increase their efficiency. Each improved stove reduces fuel wood consumption by 21 % and reduction of 0.6 tone of CO₂ per year. So far 22,000 have been disseminated nationwide since 2005.

HIV/Aids

Although HIV/AIDS is not an environmentally related disease, nevertheless it has an impact on household structures, incomes, labour and cost of caring for people with AIDS are high.

Effects of Globalization

Although globalisation has encouraged free trade, economic integration and competition, the main beneficiaries so far have been the advanced developed countries.

Conflicts, Insecurity and Environment

Disasters such as conflicts, insecurity, drought, and environmental degradation have affected the poor substantially and clearly exacerbate economic deprivation in the short term. They can also compromise a household's long-term economic well being if survival requires the sale of assets, such as those the family had planned to use to finance their children's education.

The main questions that need to be addressed are the following:

1. How can National Food Security be achieved sustainably and can international food assistance be used more efficiently and effectively?
2. African countries are carrying out major promotional campaigns not only internationally but also regionally for markets, however it seems a daunting task as even the Western countries are protecting their markets. What can be done to resolve this issue?
3. Although no nation can claim to be totally self-reliant it is believed that self-dependence enhances people's independence of thinking, innovativeness, perseverance and pride in work and these attitudes permit and accelerate economic development. Hence can one say that the policy of self-reliance is a fallacy?
4. Can natural resource governance and sustainable development and livelihood improvement be achieved in countries that do not practise good governance?

1. INTRODUCTION

1.1 Background to the study

The purpose of the study is to understand the extent to which environmental assets (goods and services) are important to livelihoods of people in the IGAD region and the extent to which such values are integrated into macro-economic planning (PRSPs) and so support national and regional delivery on the MDGs.

The following issues will be explored in detail namely:

- How natural resources are a core component of people's livelihoods in Eritrea and can make major contributions to the achievement of the MDGs and PRSPs;
- How devolved governance structures are becoming an increasingly important component in the region and how this can improve rural people's livelihoods and reduces risk;
- How rural people need to be able to engage in the market place so that larger proportions of income from natural resources are trapped at the community levels;
- To explore how Natural Resources can be reflected in national accounting, PRSP indicators and other measures of national growth and how this can be improved in practical ways;
- Explore the variety of major emerging issues, which have a potential important impact on livelihoods and Natural Resources.

1.2 Profile of Eritrea

General

Eritrea is located in the Horn of Africa between 12° 22' and 18° 02' north and between 36° 26' and 43°13' east serving as a bridge between the rest of Africa and the Middle East and the Gulf States. It borders with the Sudan in the west, Ethiopia in the south, Djibouti in the southeast and with the Red Sea in the east.

Eritrea has a total land area of 124,300 km² with a coastline of 1200 kms along the important Red Sea oil and shipping route connecting the Mediterranean Sea with the Indian Ocean. The Eritrean territorial waters are around 120,000 km², stretching out to the Red Sea Central Rift and has around 390 islands in the Eritrean Red Sea zone, the prominent being the Dahlak Archipelago.

The Eritrean landscape is characterised by a chain of high mountains extending from the north to the south, while the lowlands are situated to the east and west. These topographic entities form the six main agro-ecological zones in the country (FAO, 1997) namely moist lowland, arid lowland, semi-desert, moist highland, arid highland and sub humid. However, there are several micro-ecological zones between the highlands and the lowlands, which provide habitat for different plants and animals (DoE, 1995).

Population and Livelihood

Eritrea has a population of about 3.5 million people, which are equally divided between Christians and Muslims. It is home to nine ethnic groups, each with its unique cultural heritage and language.

Over 84% of the population are based on subsistence economies. Pastoralism and agro-pastoralism are the major production systems in the Eastern and Western Lowlands of Eritrea and is estimated by the UNDP to comprise of about one third of the total population.

Crop based agriculture - mainly rain fed agriculture in the form of mixed farming - is predominant in the Central and Southern Highlands.

Status of the Environment

Eritrea falls within the African Sahel belt, which is characterised by low rainfall, high climatic variability, recurrent droughts, and desertification exaggerated by the overuse of natural resources.

Land is the most precious and the most important natural resources of Eritrea and some 80% of the Eritrean population derive their livelihood directly from it. The cultivated cropland or arable portion of the landmass, which is circa 3.5%, is the key resource that needs to be protected from encroaching desertification or land degradation. One of the major causes of land degradation is deforestation. The loss of vegetation cover has accelerated the loss of soil and water through runoff and is responsible for low soil fertility and declining agricultural production. This is mainly related to agricultural expansion and fuel wood consumption. This is by far the greatest environmental challenge that the people of Eritrea face.

Eritrea is estimated to have had 30% forest cover at the end of the 19th century; which has fallen to <1%. This is mainly because of expansion of agricultural concessions and the establishment of sawmills during the Italian colonial era. In addition to this the traditional system of cutting large number of trees for constructing houses has also exacerbated the situation.

At present the natural vegetation of the country constitutes 0.8% highland forest, 11.3% close, medium and open woodland; 63.8% grassland/wooded grassland/ and bushland, 1.6% riverine and mangrove forests.

Natural resources play an important role in rural livelihoods, and especially to mitigate risk and contribute to resilience. It is for that reason that the Eritrean Government places strong emphasis on environmental issues and participatory processes. In spite of these policies and commitments there has been much degradation of the natural resources and the environment.

Approach of study

Literature review was done from national, regional and international documents related to the Environment, Natural Resources, Poverty Reduction, and Sustainable Development. Key issues affecting the state of the environment in Eritrea were identified. The relationship between issues affecting management of the environment with national policy frameworks, and strategic development action plans were also established. Focus was made on collecting relevant information/data from line ministries; UN agencies and NGO's as well as consultations were also carried out in the form of individual interviews.

2. ENVIRONMENTAL AND NATURAL RESOURCE AS KEY ASSETS FOR RURAL ECONOMIC GROWTH AND LIVELIHOOD IMPROVEMENT

2.1 Natural resources as a core component of people livelihoods

Natural resources are the core component of people livelihoods because natural resources are one of the capitals of livelihoods. Clearly, natural resources are very important to those who derive all or part of their livelihoods from resource-based activities (farming, fishing, gathering in forests, grazing, cropping, mineral extraction, etc). Although our understanding of linkages between resources remains limited, we know that we depend for our health and well-being upon the continued functioning of complex ecosystems (which are often undervalued until the adverse effects of disturbing them become apparent).

Eritrea has rich and varied natural resources, resulting from a diverse range of climatic and ecological conditions. However the natural resources is fragile, due to aridity and low rainfall. Land degradation and desertification are the most serious and widespread problems facing Eritrea. Since the poor often acquire a significant part of their income and consumption from natural resources, their ability to meet their daily needs is also affected when the quality of natural resources degrades.

In Eritrea, past donor rural development efforts focused largely on building natural capital. Indeed concern with natural capital itself has tended to detract attention from the more important issue of how natural capital is used, in combination with other assets, to sustain livelihoods.

The studies that have been carried out in Eritrea by the AMRF Project (MoA and SOS Sahel, 1999) indicated that since 1996 there is a clearer picture than ever before of the ways in which the forests are being used, and the dangers to which it is being exposed. A socio-economic survey was carried out in 25 villages on the Upper and Lower Gash and the Upper and Lower Barka areas during 1997 and 1998. On the basis of economic analysis alone the studies have shown that the riverine forest in their present condition generate more value per capita for the local population than any other form of land use (Doum palm forest generates 17.8 Nakfa/person/day compared with wage labour on irrigated farms of 15 Nakfa/person/day). When all the other benefits that the forests provide are taken into consideration, the importance of conserving the forests through sustainable participatory management is evident.

In addition, the riverine forest of Eritrea are an essential component of the traditional livestock production as they provide fodder and/or browse and shelter during the dry season. There is a high dependence by livestock on forest products. The AMRF study show that about half of the surveyed villages use a resource management technique called the "Dammering system" that allows them rational and rotational use of resources both near and distant from the riverbanks. It is not clear whether the new form of human settlement (villagisation/sedenterisation), will allow the continued use of this system, as the dammering system involves the movement of the family and herds between dry season and wet season camps, at a distance of 5 – 10 kms. Moreover, dry season grazing reserves are becoming more and more scarce due to competing land use demands. The continuing insecurity, which prevails due to the current political situation in neighbouring Ethiopia, has also started to affect long-range transhumance. It is obvious that the current livestock production system in Gash-Barka based on extensive grazing is under threat.

The AMRF survey indicates that the total economic value of the riverine forest is much greater than is shown by the quantifiable data that can be obtained for production outputs and consumption. In addition the riverine forest provides ecological goods and services like flood and erosion, windbreaks, shade and shelterbelts, and the future possibility of carrying

out multiple economic activities including commercial activities utilising locally produced commodities.

The AMRF survey findings revealed that in the whole surveyed area of Gash-Barka, a very large proportion of the households (45% in Barka and 59% in Gash) are dependent on forest resources for their livelihoods, which is in the range 15 – 30% of their total income. Based on these findings it can safely be assumed that there is a lot of pressure on natural resources. Hence with a declining forest and woodland cover, and compounded by problems of soil degradation, it is clear that these goods and services will no longer be so easily available to the rural communities. As a result rural people will not have the variety of options open to them to secure their livelihoods and “come out of poverty”.

Having a variety of livelihood options mitigates the risk resulting from drought, disease or market failures. Using and managing forests on a sustainable basis so that they actively contribute to livelihood security and poverty reduction helps to ensure the retention of other important functions of forests, for example water catchments functions, conservation of biodiversity, and of important cultural and sacred sites (Stockholm Declaration, 1972).

2.2 Contribution of Natural Capital to the Achievement of the Goals of MDGs, NSSD and PRSP

Although the International development Target on environmental sustainability and regeneration calls for *‘the implementation of National Strategies for Sustainable Development in all countries by 2005 so as to ensure that current trends in the loss of environmental resources are effectively reversed at both global and national levels by 2015’*. However, in its present deteriorated and depleted state, natural resources and environmental conditions in Eritrea will not contribute significantly in the achievement of National Strategies for Sustainable Development (NSSD), Millennium Development Goals (MDGs) and the objectives of Poverty Reduction Strategy Paper (I-PRSP). It is important to note that it is not only the existence of different types of natural assets that is important, but also access, quality and how various natural assets combine and vary over time that determine the contribution of natural resources and environmental qualities to the achievement of the goals of sustainable development and poverty reduction objectives. Although value adding of natural resources is currently in progress, it is still early days.

2.3 The policy and legal incentives in place or evolving

Given that Eritrea has only been independent since 1991, national policies and institutional frameworks, relating to environmental management and/or natural resources, both at the macro and micro levels are still evolving and being shaped aimed at stimulating economic growth and the conservation of environment and natural resources. Over the last few years the government has taken considerable efforts to formulate the necessary environmental policies and strategies. Moreover, all of them reflect national priorities, which will help Eritrea in poverty alleviation, economic growth and in protection of its natural resources. Institutional structures are also changing constantly to cope with new challenges and demands.

The government has identified that there is a direct relationship between poverty and land degradation in Eritrea, because the poor often acquire a significant part of their income and consumption from natural resources. Their ability to meet their daily needs is also affected, when the quality of natural resources degrades. It is also important that the links between biodiversity and the people of Eritrea are made so as to demonstrate the variety of ways people use and manage their natural resources, and the embodying customary rules and regulations for controlling that use. It is for that reason that the Government of Eritrea places strong emphasis on environmental issues and participatory processes. In spite of these

policies and positive commitments, there has been much natural resource and environmental degradation (MoA, NAP Road Map, 2005).

Consequently the government undertook a series of initiatives to strengthen the country's economic development and food security.

2.3.1 Policy and Legal Incentives

The main policies and strategic papers such as I-PRSP and Food Security, which are aimed to alleviate poverty, are reviewed and its implication is assessed.

Transitional Economic Growth and Poverty Reduction Strategy paper (TEGPRS)

Poverty reduction and economic development is addressed in the *Transitional Economic Growth and Poverty Reduction Strategy* (2001), which lays out the government's policies for macroeconomic management, steps to create the conditions for economic growth, and policies and programs to ensure that growth is widely shared.

Interim Poverty Reduction Strategy (IPRSP), 2003.

By 2003 the Government prepared the IPRSP, which represents an initial articulation of the Government's response to the urgent need to reduce the incidence of poverty in Eritrea. The proposed strategy, which is long term in perspective, reflects national priorities and realities and the policies and the programs that will accelerate and make poverty reduction sustainable in the long run.

The draft interim strategy was prepared through a Participatory Poverty Assessment (PPA) process that provides opportunities for dialogue with key stakeholders, including civil society, private sector and the development partners and the Household Living Standard Measurement Survey (LSMS) – qualitative survey (NSEO, 2003b).

Eritrea's Interim Poverty Reduction Strategy (I-PRSP) is anchored on the following three building blocks:

- Restoring economic growth, while maintaining macro-economic stability;
- Raising Income of the poor segments of the population;
- Enhancing Human Resources Endowments by providing basic essential services and widening the security nets to benefit the most vulnerable; and
- Putting in place the enabling environment – a pre-requisite to rapid economic growth and sustained poverty reduction.

In order to implement the proposed poverty reduction strategy sectoral policies, strategies and measures were studied and adopted for the medium term economic growth and poverty reduction objectives.

Food Security

The Eritrean Government has formulated a food security strategy and a realistic plan to meet the challenges, which will form an integral part of the poverty reduction strategy paper. This study was based on the Household Living Standard Measurement Survey and the Food Insecurity Assessment in Eritrea: Evidence from Household Survey, (2003b); as well as the Participatory Poverty Assessment (PPA) study.

The long-term vision of the Government is to achieve national and household food security. The strategy for achieving National Food Security rests on three pillars: raising agricultural

productivity and improving marketing of agricultural output, b) improving national capacity to import food, including keeping a strategic reserve and c). Using international food assistance more efficiently and effectively.

In order to increase agricultural productivity the plan is to:

- To expand rain-fed cultivation in high potential areas in eastern and western lowlands;
- Expanding areas under irrigation in the high potential areas;
- Promoting improvement in land use in dry highland areas by focusing on land use improvement measures that would reduce soil erosion, conserve topsoil, restore soil fertility and improve water conservation;
- Expanding forestland and improving management of rangelands in partnership with communities;
- Enhancing Livestock Development, by increasing pasture lands and reducing their degradation. Developing the Fisheries sub-sector and boosting exports;
- Improving agricultural marketing and distribution systems.

The food security projects have to be closely monitored as no strategic plan can be effective without understanding the carrying capacity of land, the extent of marginal lands as well the fact that expansion of agriculture in marginal areas may only exacerbate land degradation and may only bring low returns.

Trade policy

Eritrea is committed to maintaining an open and liberal trading policy and promoting regional economic cooperation. To encourage rapid expansion of trade and allow free movement of capital and goods, the government has eliminated or substantially reduced all trade barriers (GoE, 2001).

In addition to these unilateral steps that have been taken or are being taken, Eritrea is working with countries in eastern and southern Africa to enhance free movement of goods and services in the IGAD and COMESA regions. Eritrea is a member of both the Intergovernmental Authority on Development (IGAD) and the Common Market for Eastern and Southern Africa (COMESA), which seek to create free trade areas for member countries. Both IGAD and COMESA countries have agreed to enact laws as quickly as possible eliminating all trade barriers between them, and are working through their respective secretariats to encourage member states to undertake the necessary policy and administrative measures to implement the agreement.

Food Aid policy

On the issue of food aid the Eritrean Government issued its Legal Notice 26/96 – Food Monetization Policy in 1996, which ended all free distribution of food as well as food for work and replaced it with a food monetization policy under which food support was replaced by cash support for labour provided by individuals, groups and communities. This was a strategy, which shifted Government development activities from a relief based economy to one in which every able bodied person is granted a job by the State all in a bid to making Eritrea less dependent on foreign aid.

Medium and long-term sectoral development plans of Ministries

Medium Term Agricultural Sector Development Plan

The Ministry of Agriculture has adopted a Medium Term Agricultural Sector Development Plan (2005-2010), whose main objective is to achieve food security by identifying potential

areas and deploying resources in a co-ordinated fashion. The main focus is on soil and water conservation, crop, horticulture and livestock development.

The MoA is also responsible for the establishment of new plantation and the reforestation of existing forest areas.

Energy Sector Development Plan

As part of the Energy Sector Development Plan the Ministry of Energy and Mines has made major commitments to increasing alternative energy resources. At present it has an electrification programme of 90 villages during 2005-2006 as well as distribution of energy efficient stoves (mogogos) and has initiated wind energy in Assab as a pilot project, as an alternate source of energy, as well as training about environmental management and planning and other regulatory training that helps the activities of the Department of Energy. This sector will help reduce the use of biomass as a source of energy and will be a very important entry point for mainstreaming NAP.

Conservation Management of Eritrea's Coastal, Marine, and Island Biodiversity

The "Conservation Management of Eritrea's Coastal, Marine, and Island Biodiversity" (ECMIB) project is being implemented by the Ministry of Fisheries and has adopted the integrated coastal zone management approach. It targets all activities affecting the marine environment, including fisheries, tourism, oil developments, shipping and navigation, port handling and urban settlements. This programme has the potential to provide the framework for the establishment of an integrated coastal zone management system in Eritrea and hence can be used as a platform to mainstream poverty reduction strategy.

For example the Fisheries laws (MoFish, 1998) provide comprehensive coverage about the development and management of the marine sector in Eritrea and contain a number of Articles relevant to the protection and conservation of marine resources, including the establishment of marine protected areas.

2.4 What are the perverse incentives (policy, law, markets)?

Lack of an umbrella Environmental Law and Sectoral legislation

So far no piece of legislation has been formally adopted as a tool for managing and coordinating the national environment. In the absence of such mechanism efforts were made by the Ministry of Land, Water and Environment to develop and introduce procedures and guidelines, known as the National Environmental Assessment Procedures and Guidelines (NEAPG; DoE, 1999), for undertaking environmental impact assessment for all development projects. The NEAPG provides mechanisms for ensuring an integrated approach for sustainable development, but its implementation process has been hampered due to many factors. One major problem has been the absence of formal legal support in its implementation process. Moreover, human resource limitations and weak institutional capacities of the Ministry of Land, Water and Environment in general and the Department of Environment in particular have also created setbacks for its implementation.

Enforcing laws

Government's inability to enforce laws governing use of, and access to land and/ or natural resources can lead to widespread exploitation of natural resources or competition between forest resources users. A typical example is the case of the riverine forest and/or natural resources around Gash-Barka, which was reported in AMRF study (MoA and SOS Sahel, 1999). The main groups of users of the forest resources are the settled communities, who extract a range of NTFP (Non Timber Forest Products including Doum palm leaf), and the mobile pastoralists for whom the forests are a vital dry season fodder reserve and a source of water. Water resources are closely linked to forest resources. Cattle and other livestock passing through the forest areas access water wells, which are dug each year in the dry

riverbed. The settled communities frequently cultivate land either within the forest or immediately adjacent to it, and animals coming to water often cause damage to unprotected crops in passing. This is especially true when the farmers have left no proper corridors for animal movement. Wildlife, particularly the larger mammals such as elephants are also attracted by water and the lush green plantations often found near the rivers. They can cause significant amounts of damage both to the agricultural activities and to the forest. Hence the competing demands of the different stakeholders has to be taken into consideration and appropriate legal measures have to be taken for those who abuse natural resources that will cause long-term damage.

Agricultural policy

While managing resources sustainably, an environmental policy that focuses mainly on the conservation and protection of resources must take due account of those who depend on the resources for their livelihoods. Otherwise, it could have an adverse impact both on poverty and on chances for long-term success in resources and environmental conservation. Equally, a development policy that focuses mainly on increasing the production of goods without addressing the sustainability of the resources on which production is based will sooner or later run into declining production, which could also have an adverse impact on poverty (Agenda 21, 1992).

One of the major activities/projects, which prevent people from being able to benefit from their natural resource assets on a sustainable basis is the issue of integrated farming system with heavy machinery. This practice aggravates soil erosion, land degradation and desertification by exposing the topsoil as it is being ploughed by heavy machinery. Moreover the system only encourages monoculture farming, which indirectly contributes to biodiversity loss. This means the project has an input in accelerating desertification, land degradation and loss of biodiversity and natural resources. Hence Food Security without taking into consideration sustainable development is fraught with long-term dangers.

Transformation of rangeland to cropland

At present transforming naturally rich range vegetation to cultivated farms is widely being practiced in Eritrea, in particular in the western lowland areas of Gash Barka. Expansion of agriculture into marginal areas and/or farming along the banks of major rivers of Gash Barka will cause long-term damage. This practice makes the top fertile soil vulnerable to erosion, and salinization as a result of dependence of dry land cropping on irrigation. Since, the rangeland forests are the largest carbon "reservoirs", the transformation of this natural rangeland will increase the emission of the GHGs carbon, which enhances climate change. Overall, this agricultural practice is linked to negative environmental consequences: more land degradation, desertification, and climate change and biodiversity loss.

Poverty Reduction and Sustainable Land Management

Many of the forest products have an economic value, which can contribute to the economic well being and livelihood security of rural people, provided there are adequate markets, that they can trap a realistic market prices, and that it is carried out on a sustainable basis.

About 22% of the income of the rural people is obtained from cultivation, and the magnitude does not vary across poverty status, while shares of non-agriculture income are trivial. On the average only 5% income is obtained from non-agricultural establishment, however the majority belongs to the non-poor group. About one fourth share in household income is aid and transfers (NSEO, May 2003a). Based on these findings it can safely be assumed that there is a lot of pressure on land resources. Hence with a declining forest and woodland cover, which is compounded by problems of soil degradation, it is clear that these goods and services will no longer be so easily available to rural people. As a result rural people will not

have the variety of options open to them to secure their livelihoods and “come out of poverty”.

Eritrea has the potential to integrate, in a responsible manner, the countries conservation resources through sound land use planning. This requires that conservation contribute to national and local land use. In such areas conservation needs to be an important component of rural livelihoods, so as to encourage rural people to actively conserve and manage their conservation resources. This project document is based on the premise that poverty alleviation is intimately linked with sound environmental and natural resource management, and in so doing will help Eritrea meet some of its Millennium Development Goals (MDGs) obligations, and actively support the PRSP processes.

Natural resources can potentially be used in a sustainable way if appropriate land management technology, regional planning and the policy framework complement one another in a purposeful way, in accordance with the principles and concepts of sustainable land management (SLM). However there is lack of nationwide Land Use Planning, and the Ministry of Land, Water and Environment has not yet put in place a land use planning regulatory framework.

Land Law

To reverse past land ownership system the Government of Eritrea issued, a new land proclamation, Land Law No.58/1994. The new land proclamation is meant to resolve various land use conflicts over land resources. Nonetheless, the Proclamation has not been implemented, at least with land distribution to peasant farmers, because its implementation process requires well-established institutional and technical capacities, which at the moment is lacking, and hence communal ownership of land is still being widely practiced.

Insecurity of land tenure in rural areas prevents people from investing in long-term activities such as soil and water conservation activities, which may contribute to the protection of the environment and natural resources.

War

The border conflict with Ethiopia is also one of the major barriers that prevent people from being able to benefit from their natural resource assets on a sustainable. Natural resources such as forests, water etc are major casualties during war.

3. NATURAL RESOURCE GOVERNANCE AT THE CORE OF SUSTAINABLE DEVELOPMENT AND LIVELIHOOD IMPROVEMENT

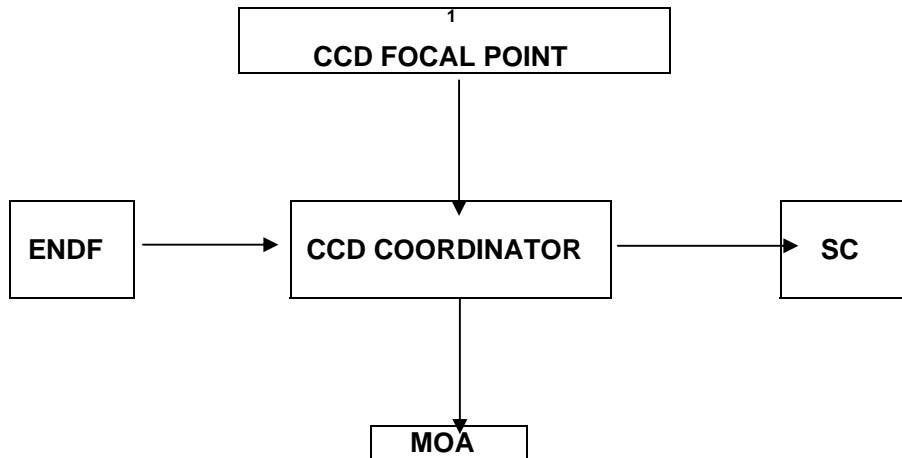
3.1 Natural Resources Governance and Devolution

Decentralized governance of natural resources (DNRG) concerns the ownership and control of, access and use of resources. This involves decision-making and the exercise of the powers over others. DNRG is considered one of the key strategies for promoting sustainable management, equitable decision-making, promoting efficiency, participatory governance and equitable sharing of benefits accrued from exploitation of natural resources at the local levels. It entails the process of transferring some of the decision-making powers and responsibilities (fiscal, administrative, legal and technical) to sub-national institutions at the provincial, district, city, town and village levels (<http://www.undp.org/drylands/gov-natural-resources.html>).

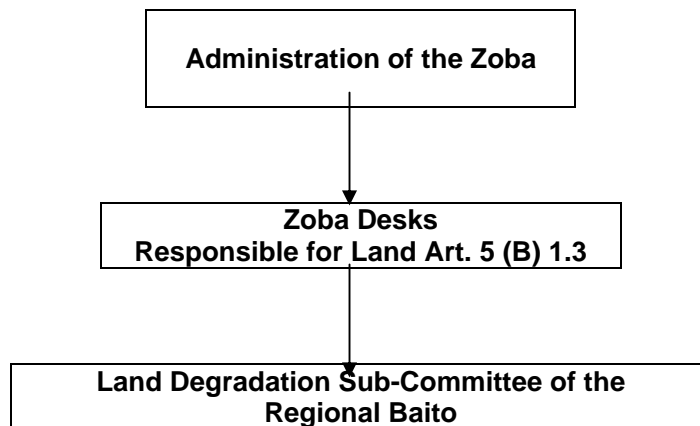
In Eritrea the Proclamation for the Establishment of Regional Administrations (No. 86/1996) and the Land Reform Proclamation No. 58/1994 provides the necessary legal basis for implementing the UNCCD National Action Plan (NAP). The governance structure that has been developed for NAP is also being used for all rural development based projects by allowing decentralisation of governance of Natural Resources.

The “**Proclamation for the Establishment of Local Governments No.86/1996**” provides the central government as being responsible for the development and introduction of policy and legislative frameworks, human resource development and to carry out research, among others. In this context environmental management issues in the Proclamation stipulates that the Regional Governor, the Sub-Regional Governor and the Village Area Administrator “**take the necessary measures to conserve and develop the natural environment**” (**Article 20, 26 and 30**). In order to implement such responsibilities the Proclamation mandates the creation of an Environmental Protection Officer within the Economic Development Section of the Regional Administration. Article 35 of the Proclamation, however, reserves the power and duties for managing national parks for the bodies of the central government, but falls short to specify which central government body has this responsibility. The powers and responsibilities of government institutions concerning environmental management in general and national parks and protected areas in particular have not yet been formally defined and proclaimed and there appears to be some gaps in this respect.

The structure proposed for overseeing the implementation of NAP at the National level is as follows:



NAP at the Zoba / Regional Level

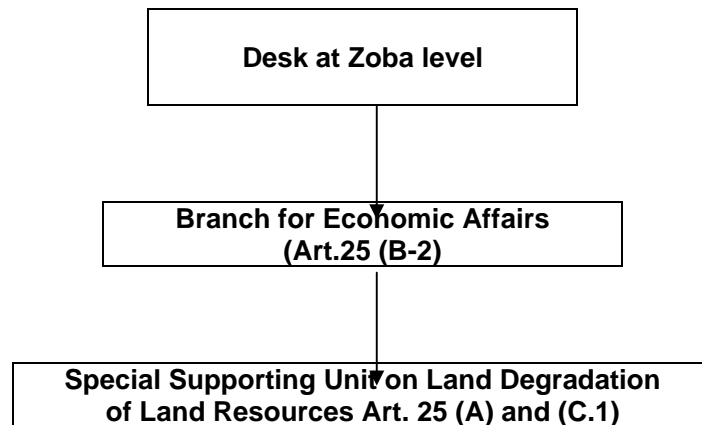


As regards the composition of the sub-committee Art. 10(3) A of the Proclamation on Regional Administration, it states that 30% of the membership shall be reserved for women and they shall have equal opportunity for the remaining 70% of the seats.

The Sub-Committee on land degradation of the Regional Baito shall have broad powers to deal with land degradation issues, *enter-alia*.

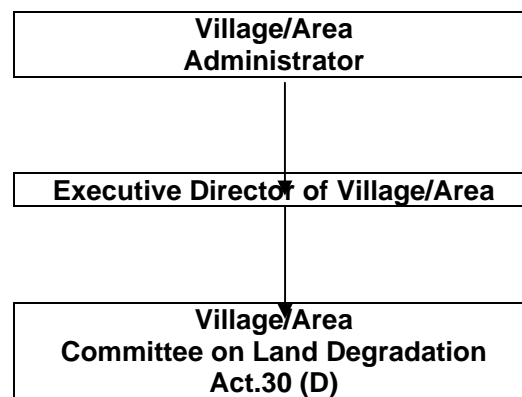
¹ MOA = Ministry of Agriculture
 CCD = Convention to Combat Desertification
 SC = Steering Committee
 ENDF = Eritrean National Desertification Fund

NAP at the Sub-Zoba / District Level



NAP at the Village/Area Level

The proposed structure for implementing the NAP at the village/area level is as follows:



The principle actors in implementing the NAP at the grass-roots level are the village/area administrator and the Executive Director.

The powers and duties of the village/area level committee are defined in Art 30 (D).

The National Forum, which is the principal platform for discussing policy issues on land degradation will bring together all the stakeholders concerned with land degradation from all levels and will be held every 3 years.

Since the GoE is undertaking an extensive programme of decentralisation to *zoba* level, effective processes must be established for co-ordination between the national and provincial on environmental issues, which are not defined by administrative boundaries. Village level committees should be empowered to co-ordinate and integrate development plans and programmes by mobilising and establishing co-operative self-help projects and programmes. However studies have shown that village committee's become successful if there is transparency, the community members must understand the potential benefits of the scheme and participate in setting project rules and must feel a sense of ownership of the resource, believing it is their resource to manage and maintain over the long term.

3.2 Natural Resources Governance and Rights

The main challenge facing us today is transforming objectives and policy directives into a set of institutional, regulatory and practical activities, which can integrate national development plans with environmental management plans to ensure sustainable economic growth and development. So far there is no harmonisation and agreement around critical issues such as the authority and procedures for the establishment and management of the environment and potential policy conflicts, such as between high-output farming, agro-biodiversity conservation and land conservation.

Lack of implementing or enforcing of Environmental Impact Assessment (EIA) has also been one of the key problem areas in mitigating environmental degradation. In addition the enabling environment for implementing NAP has not been articulated in great detail. Hence there is a need to review whether current legal measures (i.e. Land Reform Proclamation No. 58/1994) and the Proclamation for the Establishment of Regional Administrations – No. 86/1996, provide sufficient legal basis for implementing natural resources governance.

Although the NAP process (MoA, 2005) produced a clear list of priority of activities, the main value of that process which needs to be reinvigorated is the institutionalization of a flexible and dynamic framework for participatory policy-making, sector-wide planning, initiating, designing and implementing programs in areas of desertification control and drought preparedness and mitigation. It is only then that entry points in national planning processes and development agenda settings can be identified.

Land Rights

To reverse past land ownership system the Government of Eritrea issued, in 1994, a new land proclamation, Land Law No.58/1994. This Law provides that all land is owned by the State and citizens have use right only. Under this Proclamation peasant farmers have the right to use land for a lifetime and if significant investment has been made on the land then priority is given for closer relatives to inherit the property and to continue farming the land. Considering past experiences with the Diessa system of land ownership, this Proclamation appears to create conducive environment for better management of the land. Nonetheless, the Proclamation has not been implemented, at least with land distribution to peasant farmers, because its implementation process requires well-established institutional and technical capacities, which at the moment is lacking, and the communal ownership of land is still being practiced.

Property rights that govern access to these resources play an important role in maintaining the productivity and enabling equitable use of natural resources. Formal title and full transferability is not necessarily required for good husbandry, but perceived security of utilisation will influence how people make decisions about exploitation and investment in natural resources. Nor is privatisation of property rights a guarantee for sound environmental stewardship; the owner may choose to deplete the resources and move elsewhere with his profits if that is possible. Inequality in the distribution of property rights may also trap people in poverty.

Hence incentives by way of regulated prices, taxes and subsidies send important signals to resource users about economic opportunities, and may determine sustainability as well.

3.3 Natural Resources and Gender

Poor rural women, who are disproportionately affected by the degradation of natural resources, collect the bulk of the energy, fodder, and water requirement of households. This

reduces their time spent on income-generating activities, indirect income through crop production, household responsibilities and may also have a negative impact on health.

Consequently Eritrea has advanced legislation in respect of women's rights and powerful and cohesive women's associations. Because of the important role women play in the society and economy of Eritrea, the government is fully committed to raising their status, ensuring their full participation in political, economic and social processes and eliminating the disadvantages many experiences in marriage, separation, divorce, inheritance and access to property. One of the major achievements has been the traditional land tenure system, which had discriminated women's right in land use has been resolved by Land Proclamation 58/1994, which has solved the gender discrimination.

This organisational experience could also be usefully used to carry out environmental activities that can contribute to the empowerment of women. Local communities that are empowered to participate in decision-making on environmental resources can help themselves to maintain their livelihoods, gain equitable access to resources, and use these resources sustainably.

3.4 To what extent is policy and legal rhetoric being put into practice on the ground?

The Government of Eritrea gives high priority to proper conservation and use of the environment and as part of its poverty assessment, the PPA project took on board environmental issues in order to establish causes of poverty. The main aim had been to help mainstream environmental issues in development planning. However in the sectoral policies and priorities not many of the Line Ministries had given emphasis to environmental issues.

Hence, one way of alleviating poverty and improving health condition of local people is to give full access for communities to benefit from their natural resources assets on a sustainable basis. There is as such no policy or laws that hinder local communities to benefit from their resources. However, there are a lot of modalities and market access that need to be made available for easy use of poor people, who need technical and financial support from concerned government and non-governmental institutions.

The rural communities are adequately informed about their rights and responsibilities for devolved natural resource governance, as they have practiced it for centuries, however modern methods of Governance structures have being introduced without proper technical and financial support and follow up.

4. CREATING A LEVEL PLAYING FIELD: - RURAL PEOPLE AND COMMUNITIES BEING ABLE TO PROCESS AND VALUE ADD ON NATURAL RESOURCE PRODUCTS AND CAN FAIRLY AND EQUITABLY ENTER THE MARKET PLACE

4.1 How can rural people engage better in the market so that they can tap larger proportions of income from natural resources?

Smallholder farmers often have low levels of literacy, minimal access to information on production practices and potential markets. Their holdings are rural based and characterised by severe poverty. Limited access to information and contacts jeopardize the position of small producers in the marketplace, making agricultural production unprofitable and risky. This perpetuates poverty and puts at risk the resource base of rural areas.

Hence farmers need access to markets through community empowerment, resource development and market linkage intervention strategies using a qualitative analysis of the institutional support provided by the sector. The private sector should also assure technical commodity related support, export linkage, and higher incomes, while the civil service society should emphasize facilitation to a wide range of market linkages and building capacities of human resources along aspects of the market chain (Pali et al. 2007).

Market Access

Most R&D organizations agree that improved market access is crucial if the competitiveness of rural areas and its producers is to be enhanced. Promoting collaboration along the market chain, among different stakeholders, is a promising approach to increase efficiency in the market chain, by lowering the production and transaction costs, which occur between the different market chain actors. Enhance the value of the products and services generated along a market chain, so justifying higher consumer sale prices.

Many of the natural resource products have an economic value, which can contribute to the economic well being and livelihood security of rural people, provided there are adequate markets, that they can trap realistic market prices, and that it is carried out on a sustainable basis (Stockholm Declaration, 1972). It is not only the existence of different types of natural assets that is important, but also access; quality and how various natural assets combine and vary over time (e.g. seasonal variations in value). With natural resources it is also very important to investigate *long-term trends* in quality and use.

Hence the aim of the Government is to enhance the income of small-scale producers through improvements in production, value add processing, and marketing. This can only be done by analyzing the value chain of production for agricultural and non-timber forest products, identifying critical value-adding technologies which allow local communities to capture a far larger share of the value of their raw materials. However, from experience, it has been found that technology alone is not sufficient when designing successful development projects. Local policy, community resource tenure, market analysis, trust and local politics all play a role in the acceptance of new technologies in the developing world (Putterman and Koontz, 1998).

Value Adding

Value-chain analysis is particularly crucial to Small and Medium Scale Enterprises (SME) development. Analysis is done which emphasizes the value-chain of production, in which raw materials are first gathered or cultivated and processed according to a series of discrete value-adding steps. In some cases, the technology required to produce value-added material is relatively simple, and may be cheap to acquire as well. Value-chain analysis leads to an understanding of where value is added to raw materials, and the type of technology required for this.

Value-chain analysis includes an evaluation of the cost of these technologies and their suitability for local application, including at the village level. Those technologies with a high ratio of value-added to cost, which are also readily maintained locally, may be highly suitable for transfer for local enterprise development. While value-adding technology is often important, note that valuechain analysis sometimes indicates that the most appropriate intervention is in the area of marketing. For example, creating a community-owned wholesale enterprise, which can market harvested material directly to buyers, may increase community income by a hundred-fold or more.

Local and Regional Procurement (LRP) of Food Aid

Researchers and development practitioners are growing increasingly interested in the potential role of local and regional procurement (LRP) of food aid in improving the marketing of staple foods, especially in countries, which have liberalised but lack strong institutions that allow the markets to work properly. The two major players in LRP for grains are the World Food Programme (WFP) and the European Commission (EC).

In recent years WFP has also acknowledged that Local and Regional Procurement (LRP) can help to develop local commodity markets. This is consistent with the long-held view of the EC that LRP has a wider development role (as enshrined in the EC Council Regulation No. 1292/96 – dealing with food aid policy, food aid management and special operations in support of food security and which endorses the growing practice of food aid procurement within the benefiting country or from a neighbouring country). Furthermore the EC believes that this practice assists in the development of local agriculture and livelihoods in the source countries. It can also be expected to contribute to the development of more transparent and efficient domestic and regional grain marketing systems in the countries concerned, with positive impacts on producer incomes. However WFP office in Eritrea stated that the price has to be competitive for WFP to buy locally or regionally. It is possible that because of low production capacity and other limitations of inputs prices may be higher. Hence assistance is needed to develop the local agriculture before any positive impact on producer incomes is expected by using this method. (NRI, 2006; <http://www.nri.org>).

4.2 What are the policy, institutional and structural impediments for such engagement? How can these be resolved in a practical manner?

Policy impediments

Policies and development programmes to help farmers improve production and processing of forest and agricultural products will always be limited without parallel support to marketing. This study shows that efforts to assist farmers (and harvesters of natural produce) to get better and more reliable prices need to take into account full market chains - not just what happens at the “farm gate”. Market opportunities and prices are constrained by factors that affect traders first, with knock-on impacts on producers. Constraints range from heavy burdens of formal and informal taxes to a basic lack of information in villages and district market places. Policy solution lie not in drawing up new policy statements, but rather in better implementation of the many positive policies that already exist to support the poor. Fundamentally, better implementation may require some deep-rooted changes in the culture of government and development agencies, to support the individual and group initiatives that small-scale farmers and traders are developing.

Although the demand for inputs is showing improvement and the consumption pattern is skewed towards buying fertilisers, pesticides, seeds of improved and high yield varieties, fuel and energy, animal feeds, veterinary services, farm implements and irrigation equipments, there is no efficient grain marketing board, which assures sustainable pricing for the farmers.

Management through Special Districts

There may a practical manner to resolve these issues by creating Management through Special Districts. People in rural areas have long since created non-formal special districts. These take the form of self-governing entities that users of a variety of renewable natural resources (RNR) have themselves organized without formal state authorization or recognition in order to ensure the sustainability of RNR. Typically, the existence of such special districts is to ensure the effective *governance and management* of specific watersheds, fisheries, pastures, forests, wildlife populations, etc., upon which RNR users depend for survival.

In some cases, outside interventions by staff of state conservation authorities, projects, and NGOs have launched special districts. Whether entirely local in their origins or of “mixed” parentage (joint creation of local people and outside agents), a number of these non-formal special districts have proven themselves to be durable, efficient and effective, and enhanced sustainability of critical resources. The non-formal special districts that this report describes occur in Mali and Malawi. In some other southern African countries, notably Botswana and Namibia, as well as in Malawi, *formal* special districts have come into existence over the last decade and have likewise proven their utility, both to RNR users and to state and indigenous officials (ARD–BioFor IQC Consortium, 2004).

Special districts offer considerable promise as an institutional means to improve the governance and management of many RNR in the aforementioned countries. This institutional form is, however, like all others, not perfect.

Techniques exist that could be employed to encourage and enable diverse groups of stakeholders to explore various approaches to strengthening special districts, or creating new ones. Such activities might as well benefit from support in developing micro finance institutions or small enterprises based on the RNR that they govern and manage. Establishing a public consensus among RNR users and stakeholders about how to address these challenges could lead to significant benefits for all concerned.

4.3 How can rural people and communities’ better process and value-add on natural resource based products in a manner that is socially beneficial and environmentally sustainable?

There is a need to invest in improving the quality of existing products, developing new products, establishing market linkages, and building farmer organization and capacity in Eritrea.

Farmers can use vertical and horizontal integration strategies to improve their incomes. Vertical integration means taking on additional activities in the value chain: processing or grading produce, while horizontal integration means becoming more involved in managing the value chain itself – by farmers’ improving their access to and management of information, their knowledge of the market, their control over contracts, or their cooperation with other actors in the chain.

Case Studies of Value Add on Natural Resources

Fisheries

Eritrea's 1,200-kilometer coastal waters may contain the most productive fishing grounds in the Red Sea. High-value species such as lobster, shrimp and crab offer considerable potential. Value-added processing of fish and other marine resources can generate significant foreign exchange for development. To increase incomes of coastal villagers, improve the supply of protein-rich food products in local markets and boost its foreign

exchange earnings, the government is encouraging private investment in modern fishing fleets and fish processing facilities, including through joint ventures with foreign investors. In developing the fishing industry, measures are being taken to ensure sustainable exploitation of marine resources and to preserve the environment. Finally, the Ministry of Fisheries is exploring prospects for expanding artisanal fishing and establishing viable inland-water fisheries.

The Ministry of Fisheries has three major projects that is earmarked to add value to Artisanal Fishermen:

1. Small Pelagic Development Project, which is funded by an Italian NGO, is meant to add value to pelagic fish that were earlier sun dried in an unhygienic method and were used as feed for cattle. However this project has added value by giving training to Artisanal fishermen in three fishing villages namely Ingel, Duluk and Mekanele by giving inputs such as racks, mats and grinding machine so that the pelagic fish are sun dried hygienically and also are ground to form fish powders for human consumption.
2. The second project is Red Sea Coastal Development project, whose mandate is to create Co-operative of Artisanal Fishermen in order to improve fish production. It is a joint partnership with Danish Fishermen, who give support by providing cold storage facilities, nets, training and other inputs so that the Eritrean artisanal fishermen increase their income. The project is based in the Irafaile coastal area.
3. The Government has put in place a major project funded by the African Development Bank (ADB) that would help the economy of Regional Administrations as well as artisanal fishermen in three project areas namely Gelalo, Tio and Edd in order to increase fish production by providing adequate basic infrastructural facilities that would help them bring their produce to the local market. The aim was to add value by increasing production to 12,000 tons.

Although the projects had the necessary inputs there remain major constraints in terms of finding market outlets. Hence the Ministry of Fisheries is carrying out major promotional campaigns not only locally but also regionally.

So far fresh and frozen fish are exported, but frozen fish are expensive because of high-energy costs to keep them frozen and hence are focusing on exports of fresh fish. In addition exporting to European countries has been beset with problems, because of irregular transport problems, consequently marketing is being done in the region such as Yemen and Djibouti and others.

Sustainable use of natural resources / agricultural income

Approximately 60 percent of Eritreans rely on agriculture, animal herding and fishing for income and food, although agriculture accounts for only about 16 percent of Eritrea's GDP and about 20-30 percent of its current merchandise exports. Of this, staple crops comprise about 42 percent; cash crops make up about 28 percent and livestock accounts for about 10 percent. Forestry and fisheries account for the remaining 20 percent (GoE, 2001). Hence raising productivity of agriculture is important for poverty reduction.

Recognizing that increasing the productivity of agriculture is important to reduce rural poverty, enhance national food security, add to exports and support industrialization, the government undertook an agricultural sector review in 2000 with assistance from the World Bank, the Food and Agriculture Organization (FAO) and the Danish International Development Assistance (DANIDA). On the basis of this review, the government is pursuing a three-pronged strategy to increase agricultural output: expanding land under cultivation, increasing yields and encouraging production of higher-value crops for export or domestic consumption. The strategies are as follows:

a). Increasing land under cultivation.

Eritrea has about 1.6 million hectares that appear to be suitable for rainfed or irrigated cultivation, but are not currently farmed. This is true particularly in the western lowlands, where the soil is fertile and stable, rainfall is reliable and application of modern cultivation and management methods is possible. The government is encouraging internally displaced people and Eritreans returning from Sudan or Ethiopia to open new lands for cultivation by providing infrastructure, essential services, access to credit and farm inputs, and secure rights of tenure to individuals and groups. Surveys are being carried out to ensure that the areas proposed for settlement possess the necessary soil and water resources, and are not better used for other purposes, such as pastoralism.

Actions are being taken to raise productivity of traditional arable agriculture. The Ministry is implementing programs to reduce soil degradation and improve control over water in rain fed areas through the Integrated Watershed Development Program (DANIDA project) and the Land Productivity Management initiative (FAO). It is reorienting agricultural research activities to focus more on smallholders' declared problems and concerns, such as developing crop varieties suitable for rain fed agriculture, identifying measures to reduce soil erosion and improve small scale irrigation and nutrient management, and defining ways to overcome the shortages of labor and draft power. It is developing a strategy for extension that will give the private sector a greater role in delivering agricultural inputs and therefore free government agents to respond more effectively to farmers' demands for technical assistance. To create a more demand-responsive system of agricultural research and extension, it is decentralizing responsibility for program development and management to zoba and sub-zoba levels of government, and building their capacities to do so effectively. At the same time, the Ministry is strengthening its core functions in policy formulation, strategic planning, agricultural statistics development, technical advisory services, applied research, regulatory development and oversight, and monitoring and evaluation. During the next few years the Ministry will transfer most, if not all, of its commercial activities to the private sector or farmers' associations, while ensuring that essential inputs such as fertilizers, quality seeds, pesticides and animal medicines remain available during the transition period.

b). Encouraging production of high-value commodities

The Ministry is encouraging farmers to produce high-value crops and livestock products for export. It is also encouraging farmers to produce goods that can be used as raw materials for industry and high-value cash crops for domestic consumption that can substitute imports. Horticultural products with significant potential include cotton, oil seeds, cut flowers and some fruits and vegetables. Measures that the government is taking include constructing roads and water storage facilities in suitable areas, and providing information on cultivation techniques, markets and prices. The assistance package includes extension services, tractor services and seeds.

c). Forestry

One of the government's top priorities is to increase the country's forest and water resources and improve soil quality. It is undertaking an accelerated and sustainable afforestation program. One element of the program is to encourage communities to establish woodlots on community lands. Residents actively participate in designing and managing the community woodlots, and the Ministry of Agriculture provides the seedlings and overall guidance. A second element is to involve young people who are part of the Summer Youth Program in building terraces, planting trees and undertaking other soil and water conservation works.

d). Gum Arabic and Incense Plantations

Both gum arabic and frankincense are traditional non-wood products of Eritrea. Although world prices exhibit fluctuations, there exists a preference in final markets for the natural products rather than synthetic substitutes. In 1996, 463 tonnes of Incense and 117 tonnes of Gum Arabic (crude measures) were produced under MOA licence. Marketing co-operatives exist for the licensing of tappers and the exclusive processing and distribution of the products. With much primary extraction, the value-added accrues at the processing and refining stages. Tappers are usually incomers, and local people derive relatively little income at present (FAO, 1997b).

In principle, tapping should be a non-destructive harvest process. However, over the years, as the resource has apparently dwindled, the methods of extracting exudates have become more likely to injure the trees. There has been some limited replanting of both species (*Acacia Senegal* and *Boswellia papyrifera*). In fact, local pressure in Zoba Dehub prompted the Governor to request MOA to carry out replanting as a priority. After acquiring the appropriate nursery and silvi-cultural experience, the two species can be planted in the western lowlands with relative impunity from the harsh climatic conditions.

A project based on the sustainable management of gum arabic and incense for productive purposes would need to consolidate research into the species (which is ongoing at the University of Asmara), expand the resource through enrichment/plantations, and support the development of locally based co-operatives.

e). Value adding of livestock production in Eritrea

Eritrea has substantial potential for increasing livestock production. This could be achieved through production diversification, quality improvement and enhancing market opportunities for various animal products including goats, sheep, cattle, camels, pigs and poultry. Success could sharply increase the incomes of some of the poorest groups in Eritrea - the nomadic and semi-nomadic pastoralists who rely on livestock for most of their food and income. The strategy is to raise the productivity of herds by enhancing rangeland and water resources management within the traditional pastoral system, promoting superior animal breeding systems, improving animal health and nutrition by expanding vaccination and other veterinary services, developing a peri-urban dairy industry, and developing higher quality animal feed and pasture through the development of crop and livestock integrated farming systems. In addition, the Ministry is making efforts to improve marketing of livestock by providing technical advice to producers on management and marketing, helping to create market outlets, and encouraging widespread use of refrigerated transportation services for perishables. In the commercial sector, the strategy involves developing the dairy industry, by training smallholder farmers in dairy husbandry, supporting dairy farmers' associations, and establishing milk collection infrastructure.

Traditional livestock production is a major occupation in Eritrea. Pastoralism is widely practiced mainly in the Eastern and Western lowlands. However there has been shrinkage of grazing land and the progressive decline in carrying capacities due to rangeland degradation, which are reducing feed and water availabilities for the pastoral system leading to poor livelihood of the pastoralists and decreasing the role of livestock in food security, nutrition and the national economy.

Furthermore there are inadequate market facilities and marketing systems and in most parts of the pastoral areas. Many of the pastoralists sell their animals either in the Sudan (western lowlands) or to the Arab countries (eastern lowlands) that are attracted by higher producer prices for livestock and lower prices for the essential household commodities such as food grains (Solomon Haile Weldelelassie, 2002).

Income source activities other than livestock are limited in the pastoral areas mainly because, rural socio-economic development is poor and skills are absent. Some of the pastoralists are entering trade such as livestock. Some women are manufacturing articles from the leaves of doum palm trees but the domestic market is small. Some pastoralists are seasonally engaged in collecting aromatic gums in the western lowlands but such activities have not been developed to contribute to food security significantly. The basic causes include poor participation of the pastoralists, and inadequate land and water policy and poor development strategies.

4.4 What are the market chains for natural resource products? How can they be made more equitable and efficient?

A new methodology to stimulate collaboration is the Participatory Market Chain Approach, (Bernet T., Thiele G. and Zschocke T., 2006), which provides guidelines for R&D organizations confronted with the question of how to effectively intervene in market chains. Based on a three-phase process, PMCA aims to foster the market access of small-scale farmers by generating fruitful collaboration among the different market chain actors. This should help to reverse the declining spiral of competition and provide a basis for sustainable rural development and could readily be adopted by Eritrea.

5. ENVIRONMENT AND NATURAL RESOURCES IN NATIONAL ACCOUNTING, PRSP'S AND MDG PERFORMANCE

Government Vision: *(The policy of self reliance on the Eritrean economic field).*

The Government of Eritrea adopted the policy of self-reliance on the economic field. The vision of the Government is: "The country is one of the poorest in the world, given the domination of world markets by the rich countries, hence the policy of self-reliance is a necessary precondition for the establishment of an independent country". Since the early years of the struggle for independence it has worked hard to realize this aim at various levels.

It is believed that the pursuance of a policy of self-reliance is essential for full independence of a country both economically and politically, and that economic self-reliance is the essential factor in realizing self-reliant development in all other fields. This can be done by mobilizing its own resource and by depending on its own material and human resources to assure sustainable development.

Although no nation can claim to be totally self-reliant it is believed that self-dependence enhances people's independence of thinking, innovativeness, perseverance and pride in work and these attitudes permit and accelerate economic development.

5.1 Natural Resources Vs National Accounting

How are natural resources reflected in national accounting, and other measures of national growth? How can this process be improved?

The main objective of the SNA (System of National Accounts), is to provide a comprehensive conceptual and accounting framework which can be used to create a macroeconomic data base suitable for analyzing and evaluating the performance of an economy. An NRA (National Resource Accounting) incorporates environmental values into conventional accounting. It links them to economic activities, and shows how these activities utilize natural resources and affect the environment. An NRA is a satellite account designed on the principles of the SNA, but wider in scope. The information in the accounts can be applied in various ways to enhance sustainable development.

The aim of environmental accounting is to assess the sustainability of economic activities and economic growth by quantifying the depletion and degradation of natural resources. SNA further aims to provide an information system linking the economic activities and uses of a resource to change in the natural resource base. Without NRA we may easily fall into the trap of growth illusion. This occurs when estimates of the level of and changes to economic activity, development and general welfare change to a positive trend, which in fact may not be the case if one takes natural resources into account. While conventional numbers may indicate high levels of prosperity, serious environmental and health hazards may reduce people's quality of life and bring about environmental catastrophe. Things like pollution are also not properly accounted for without NRA.

If the purpose is to show how Natural Resources is reflected in the National Accounts through qualitative and quantitative changes of the natural capital, then the point of departure could be NDP (Net Domestic Product) where the depreciation of the real capital has been subtracted from the GDP (Gross Domestic Product) measures. The GDP is simply the gross return from all capital stock available to an economy and the NDP in turn takes into consideration all changes in all capital stocks, originating from the production and

consumption activities in an economy during a given year. This is mainly to help calculate, if the net investment in total capital stock, including renewable and non-renewable natural capital is positive and if the national wealth is increasing. Depletion of metal ores, loss of agricultural soils and increment of stock pollution, causing environmental degradation such as acidification has been possible to evaluate in monetary terms. Other global environmental problems e.g biodiversity loss, climate changes and O-zone depletion are not yet incorporated. Consequently Eritrea has not or is not in a position to take this into account. It is suggested that it should start in earnest.

Eritrean Case:

Due to lack of data very little empirical work on NRA can be presented about the Eritrean natural resources and environmental issue. However, recently there is a growing recognition that economic growth could have detrimental effect on the environment and at the national account as a whole. It is well known that many developing nations have achieved their economic growth at the expense of their natural resources. The government of Eritrea tries not to repeat such mistakes.

Eritrea is endowed in mineral resources and the role of its socio-economic impact has to be assessed and take into consideration.

What has to be done to improve this process?

To environmentally adjust system of national account the system boundaries have to include different forms of natural capital:

1. Capital depletion shall be subtracted from GDP to construct NDP. In the SNA (system of national account) framework this is standard procedure.
2. The resource rent, which is part of the value added in extractive sectors should be (if exploited) considered as depletion of natural capital and not be part of the production value. This means that one makes a distinction between income and natural resource rent in the value added from primary sectors. This is done by assuming that all resource rents from exploiting non-renewable resources are reinvested and all but the interest from the new investment is considered as depreciation (depletion of capital). In the SNA framework the capital asset boundary is extended to include non-renewable natural capital, which will be depleted if mined.
3. All changes in the natural capital stock that originate from external effect from this year's production and consumption affecting production and consumption possibilities of future year, should if practically possible be qualified and valued. Pollutant accumulation (a negatively valued stock formation) can cause environmental damage directly or with a time lag, proportionally or disproportionately (after passing a threshold value). The deterioration of the ecosystems will continue until either environmental restoration measures are taken and/or emissions are reduced so that the critical loads will no longer be violated and the ecosystem can heal by itself. In the SNA-framework, this means extending the asset boundary to include living ecosystems, i.e., renewable natural resources, which feed the economy with inputs, while at the same time assimilate waste, which could otherwise cause damage.
4. All damages on ecosystems, materials and human health, taking place in a given year (having affected GDP) due to negative external effects from this year's production and consumption, will be corrected for by " The Polluter Pays Principle". This is done to illustrate the distributive effects of polluting activities. Consequently, the damage costs incurred will be subtracted from the causing sector, while the same

sum is added to (compensate) the suffering sector, not changing the total sum of GDP. However, the different sectors' contributions to the total value added will be changed. This means moving value added between sectors within existing SNA boundaries. The fact that many pollutants are transboundary creates accounting problems when the polluter pays principle is used as an accounting guideline. The polluter and the ecosystem, being affected, may be located in different countries. The same applies to the fact that the pollutants may be dumped to the Red Sea. Rearranging value added means in that case that the effects cancel out on a global or even on a regional level, but not necessarily on a national level. Thus, the national GDP-figure could be affected by this exercise. Another possibility to make all income losses for the suffering sectors visible is to construct a potential NDP.

5. In the best of all worlds all sectors could maintain their highest possible production volumes without causing any damage to any other sector. In that World it would be possible to produce a potential, higher NDP. Otherwise suffering sectors would produce as if they had been unaffected, having a higher value added than normally, while nothing needs to be subtracted from the causing sectors, as they have not had any negative external effects. However, this would only be possible in a hypothetical World, where the necessary environmentally friendly technology could be delivered free of charge to the economy, not crowding out any productive use of the existing resources in the economy. The difference between the potential NDP and the regular NDP shows the value of the (static) environmental degradation, where the pollution causes damage the same year as it is emitted, i.e., the sum of all value added moving around according to "the polluter pays principle". To get hold of the (dynamic) environmental degradation, where the damage is lagged in relation to the emissions, one has to look at the difference between the regular NDP and the EDP. One can calculate the total (static + dynamic) environmental damage caused in a single year, affecting NDP that same year, and future years' NDP as well, by subtracting the EDP from the potential NDP.

5.2 Environment, Natural Resources aimed at PRSP and MDGs

Does the country have indicators or means to measure that reflect the value of the environment and natural resources in the PRSPs and the performance of all the MDGs?

In Eritrea there are a number of projects aimed at the attainment of the MDGs and the PRSPs. These various programs and projects are implemented by the various sectors including the agricultural sector, the health sector, the energy and mining sector, the water resources sector and many others. The Ministry of Land, Water and Environment is the central agency in the government that is in charge of preparing, in collaboration with all stakeholders indicators that measure the value of the environment and natural resources while these projects and programs are under implementation. To have a clear picture how this process is conducted it is important to see as an example two projects that are aimed at the attainment of the Millennium Development Goals and the Poverty Reduction Strategy Program. These are the Integrated Rural Development Programs – the Energy Dimension and the Provision of Energy services for the Attainment of MDGS.

The two programs have being selected, as they are energy and mineral resource related programs, which have a direct bearing on the value of the Environment.

1. Provision of Energy services for the attainment of MDGS

A. Background

Lack of access to modern energy services is one of the major impediments to the improvement of the welfare of the rural poor in Eritrea. Energy is important for human development and it is closely linked with vital areas of concern like poverty, environmental degradation and gender inequality. However, until recently the essential relationship between energy and these vital issues did not receive due attention. Energy is today recognized as an important means to create opportunities for people living in poverty for self-sustaining improvements in their living conditions.

Based on this programme, the Ministry of Energy and Mines (MoEM) and the United Nations Development Programme (UNDP), in collaboration with other ministries and local administrations, will provide selected MDG-compatible energy services to communities in Eritrea that are likely to remain grid inaccessible until 2015 and beyond in an environmentally benign and affordable ways. The action will bring improved stove and affordable solar powered lighting to households, and PV systems to health facilities, schools and village water points without any form of power. These energy interventions will ensure sustainable and healthy cooking, better illumination, better health service including at night, higher quality of education, and safe and adequate drinking water to communities that are more than 10 kms away from actual or planned grids.

B. Objectives of the Energy component

The overall objective is to provide selected MDG-compatible energy services to communities that are likely to remain grid inaccessible until 2015 and beyond in an environmentally benign and affordable ways.

The specific objectives are to:

1. Ensure sustainable cooking by disseminating improved stoves;
2. Provide better, healthy and affordable illumination;
3. Provide better educational and health services in rural areas through modern energy services;
4. Improve access by rural poor to safer and adequate water, and
5. Assess the impacts of modern energy interventions.

Why focus on Energy sector?

Eritrea's energy sector may be viewed as having two features: lack of access by more than three-quarters of the country's population to modern commercial energy and consequent dependence on biomass fuels, and its total reliance on imported oil. Over 70% of the population reside in rural areas, and derive 93% of their energy from traditional biomass fuels, mostly fuel wood, dung and agricultural residue. In rural areas 97% of the population lack access to electricity compared to 22% in urban areas. Forest off-take rate in Eritrea is 2.4% - 2.8% of stock although the recommended sustainable harvest threshold for Sub-Saharan Africa is 1.25%. Therefore the rural community, where poverty is prevalent, has to be assisted to move out of the poverty trap through the provision of electricity and other energy forms.

Taking these into consideration the Ministry of Energy and Mines has MDG-parallel targets for 2015, which aims at reducing by half the number of people with i) inadequate lighting, ii) MDG incompatible cooking methods, and iii) providing all social amenities with modern energy. It is in view of the energy problems that the rural poor face and the energy targets of the MoEM that this action has been prepared.

2. Integrated Rural Development Program (IRDP): *(Energy Dimension)*.

Background

Eritrea continues to be among the lowest per capita energy consumers in the world. At the national level, merely 32 % of Eritrean population has access to electricity, 78 percent in urban areas compared to only 3 % in rural areas. Biomass remains the main source of energy, particularly for rural households where 95 percent of their energy requirements is currently derived. Eritrea's current pattern of energy consumption is unsustainable as biomass is becoming increasingly scarce and dependence on imported oil is draining its limited foreign currency earnings. Therefore, a sustainable and integrated approach to the delivery and use of modern energy services in rural Eritrea becomes necessary to the attainment of the nation's social and economic development.

The core activity in the Integrated Rural Development Program (IRDP) is agricultural development in rural areas. The main objective of the energy intervention in the IRDP is thus to secure energy supply for the effective implementation of the agricultural development activities of the IRDP in all Zoba's. Since irrigation is going to be the main task for the food security program that is currently the focus of all government efforts, it is anticipated that electricity will play a key role.

To develop the above objectives the following strategies are to be included:

- * Extend medium voltage network from the nearest source to the selected village sites;
- * Extend low voltage distribution networks to the irrigation sites and the villages;
- * Introduce solar home systems for households and solar water pumps for irrigation or wind based as alternative energy in grid-remote sites;
- * Introduce improved stoves as part of the natural resource management activities;
- * Create awareness program for energy conservation.

Justification

Continued low productivity and impaired economic growth is the typical characteristics of the economic sectors like, industry, agriculture, transport, construction, tourism, etc and the social sectors like education and health. It is also clear that energy is one of the key essential inputs for production, conversion, processing, commercialisation and social well being. For instance, in the agricultural sector, increased yields and production due to energy and other inputs, can lead to important benefits such as improved incomes, new employment opportunities and agro-industrial growth, which will in themselves tend to increase energy demand. In this context, energy can be viewed as a "motor" for development.

Due to lack of access to modern energy, farmers succumb to traditional means of preparation and cultivation of their land followed by improper harvesting, storage and processing their yield to maximize return. This leads them to engage in highly inefficient and unsustainable practices such as shortened and inadequate cultivation periods, loss of food due to poor harvest and storage techniques or excessive use of dung or fuel wood for cooking food or processing. Thus, the need to increase the overall access to all types of energy supplies in rural areas, within the context of environmentally sound and sustainable development, becomes urgent in a manner not less than any other factor.

5.3 Natural Resources and Marketing Trade

To what extent are natural resource assets reflected in national and regional marketing and trade? How can this be improved?

Accurate reflection of natural resource assets in national and regional marketing and trade is very important to arrive at the true accounting of a country's economic activity within a given period of time. Hence a given system of accounting of trade in a country should be designed to reflect both the domestic and international aspects of interactions between the environment and the economy. The prices of goods and services do not reflect the environmental effects of their production. The economically efficient implementation of environmental protection measures allows for a correction of such distortions and must become part of overall trade liberalization efforts.

Accurate reflection of natural resource assets in national and regional marketing and trade is very important to arrive at the true accounting of a country's economic activity within a given period of time. However because of lack of capacity and the problem of accurately assessing the value of natural resources and costs of environmental protection measures it has not been possible to accurately reflect natural resources in national and regional marketing and trade.

For a number of historical reasons and its recent colonial past, the Eritrean economy has been tied to international commodity markets through agricultural and raw material exports. The country's major traded items are of primary nature. Agricultural products comprise of almost all of the nation's exports. The country's mineral resources are yet to play a big role in the international market. Having said that, it is important to note that natural resources and environment products have been actively traded and marketed in the countries of the region. To clarify this point we can look at the trade and marketing of mineral resources in Eritrea.

Situational analysis: (Natural Resource Trade and Marketing in Eritrea).

Mining:

Eritrea's Mining Industry is small but has growth potential. Its mineral resources include substantial reserves of gold, copper, zinc and barite, feldspar, kaolin, potash, rock salt, gypsum, and marble. If mining were developed, Eritrea's proximity to the Middle East and Europe would be favourable to the export of Minerals to those markets. In the absence of domestic investments, companies from Australia, Canada, France, South Africa, and the United States have operated or now carry out exploration activities. Mineral exports accounted for US\$12 million during 1998.

Gold and Copper

Gold was produced in Eritrea by Italian companies during the Colonial period as well as by Eritrean artisanal miners. From 1997 to 2000, the production of gold declined by nearly 57%, this decrease may be attributable to the fall in gold prices and the war with Ethiopia. In 2000, the value of gold produced in Eritrea amounted to USD\$1.7 Million.

Cement:

The Eritrea Cement Factory, which was the country's only cement producer, was able to increase output in 1999 owing to upgrades of equipment and employee skills. The war with Ethiopia caused the production of many construction materials to decline during 1999 and 2000. In 2000, the value of gravel and crushed rock amounted to \$418,000; sand, \$367,000; and limestone, granite, marble, basalt, and silica sand, \$399,000.

Salt:

Salt producers in Eritrea such as Alkelder Salt & Affiliates, Assab Salt Works, and Massawa Salt Works have produced salt amounting to US\$909,000, during the year 2000.

5.4 The Functioning of SEA and its relevance to other sectors.

Is Strategic Environment Assessment (SEA) used in a practical and function manner so that the different sectors (and Programs) responsibly integrate environmental aspects of different relevance to the sector?

Introduction

Amongst the assessment tools available for utilization in order to achieve ecosystem management is SEA (Strategic Environmental Assessment). SEA involves a holistic approach that considers the projected environmental impacts over time of multiple actions within a region or ecosystem. In contrast to Environmental Impact Assessment (EIA), SEA provides decision-makers with information, strategies and actual and projected information on environmental effects on a large scale. SEA's wider frame enables policy-makers to anticipate effects on species, habitats and ecological processes that site-specific studies do not capture. SEA also facilitates an ecosystem approach, which emphasizes the importance of holistic analyses. SEA is used to facilitate decision-making processes for spatial planning. It incorporates both socio-economic and ecological/environmental assessment elements.

Once spatial planning decisions have been made – through the use of the SEA process – Environmental Impact Assessment (EIA) can be utilized to assess and mitigate the environmental impact from specific projects or operations. Delivery can be achieved through the use of a variety of tools. While not the primary subject of this answer, delivery tools predominantly fall into three areas:

- (i) Spatial measures, for example, representative networks of protected areas, permanent or temporary no-go areas, no exploitation areas;
- (ii) Level controls, for example, limits on extraction of a resource or on volume or concentration of a discharge;
- (iii) Best practice, including appropriate technological advances.

Restoration techniques include measures, which aim to restore degraded, damaged or lost habitats and/or wildlife populations, including, for example, regeneration areas for fisheries, habitat restoration and re-creation schemes, as through managed realignment of flood defenses. The application of these tools requires flexibility and adoption to local conditions. Putting these measures in place also requires a decision-making process and ways and means of monitoring and evaluating the success of the measures.

What Are the Benefits of SEA?

The benefits of undertaking an SEA are significant. Fundamentally, SEA – by considering environmental impacts at a policy, plan or program level – identifies those areas of environmental concern that may not be obvious by the consideration of impacts resulting from individual projects or operations in isolation. For example, the undertaking of an SEA of energy policy would facilitate the consideration of continued exploitation of non-renewable mineral resources against the climatic impacts of burning fossil fuels and the development of renewable energy sources. SEA potentially:

- Encourages consideration of environmental and social objectives at all levels, including those of policy development, plans/programs and specific project objectives;
- Facilitates consultation between various government bodies and stakeholders and enhances public involvement in the evaluation of environmental and social aspects of policies, plans and projects;

Individual EIAs subsequently can be applied in areas considered suitable for development. The considerations undertaken in the SEA process need not necessarily be limited to environmental issues, as the impacts of policies, programs and plans upon society are also being viewed with considerable concern. The SEA process can also be utilized to assess the over-arching impact a particular policy, plan or programs might have upon such socio-economic factors as:

- Population demographic and distribution;
- Economic conditions;
- Employment;
- Cultural values and assets;
- Overall quality of life;
- Social structure; and
- Societal resources.

Through consultation undertaken with communities and interested parties as part of the SEA process, it is possible to identify the: issues, needs, concerns, values and ideas of those communities and sections of society that may be influenced by a particular policy, plan or programs, and integrate these with identified areas of environmental concern.

So far no SEA has been carried out of major resettlement programs as well as cement factories. However since all mineral exploration / mining companies are by law required to carry out SEIA before the granting of mining licences all the companies including Nevsun Resources, Sunridge Gold Corp and Sub-Saharan Resources are carrying out SEIA. Nevertheless in the absence of an umbrella environmental law the SEIA is done only using the NEAPAG guidelines.

Steps to improve the process of SEA

To improve the effectiveness of a Strategic Environmental Assessment (SEA) it should be designed to achieve all what an Environmental Impact assessment can achieve and also address issues outside the scope of an Environmental Impact Assessment. Therefore it should be made to achieve the following:-

Prediction

- Review of all phases of a project prior to execution and identify areas that might interact with the environment (including local community) positively or negatively;
- Quantify the scale of interactions and determine the acceptability or otherwise (against standards);
- When interactions are unacceptable, result in mitigation, e.g. change to the project, change to design in order to meet acceptance criteria or abandon project.

Monitoring of environmental/social parameters during development and evaluation against predictions to ensure acceptance criteria are met through the following measures:

- Improve decision-making;
- Improve future assessments and planning;
- Improve public understanding;
- Improve company credibility;
- Align expectations and reduce conflict;
- Increase cost efficiency.

6. ANALYSIS OF THE IMPORTANT EMERGING ISSUES WITH RESPECT TO THE ENVIRONMENT AND NATURAL RESOURCES

6.1 Invasive Species

6.1.1 Key emerging Issues in Eritrea

Alien introductions, which spread without the support of man could be classified as invasive. Invasive alien species are a growing threat to the biodiversity and the livelihoods of poor, rural communities in Eritrea. The fragile and degraded ecology of much of the landscape provides great opportunities for alien invasive plant species to establish themselves and spread.

The Eritrean Red Sea is part of a major shipping route. The potential for the accidental introduction of alien invasive marine species is therefore high, especially through blast water discharge. Similarly, increasing numbers of alien species are being introduced by coastal development projects without due regard to issues of environmental testing and impacts, monitoring or containment security, reflecting a conflict of interest between development and conservation at the Ministerial level.

The Indian House Crow (*Corvus splendens*), since its introduction in 1970, now dominates the urban area of Massawa and is now spreading inland. Some introduced plants, such as *Prosopis chiliensis*, are also spreading following introduction to Massawa. The impacts of the recent introduction of at least seven exotic species at the new aquaculture venture in Massawa remains unknown but poses a potentially serious threat to Coastal, Marine and Island biodiversity with the introduction of potentially competitive marine and halophytic species such as *tilapia*, *Peasenus sp.*, *Salicornia sp.* And *Rhizophora sp.*

All alien species of crop and forage species and livestock should be assessed for their invasiveness. Within the agricultural sector, alien introductions are of two kinds: (i) introduced crop, livestock and forage species and varieties; and (ii) the introduced pests associated with crops and livestock. High Yielding varieties (HYV) of sorghum and pearl millet are being introduced to Eritrea but the total area of these varieties grown is small relative to total cultivated areas. Wheat is the most threatened cereal to genetic erosion since old (Kenya varieties) and recent introductions (Canada, Australia, Boohoy varieties) are cultivated relatively frequently by farmers in scattered areas in Zoba Maekel and Debub sub zones. Weeds and other crop pests are a major problem in Eritrean agriculture, where the level of chemical pesticides used is extremely low. These pests in general reduce agricultural productivity rather than representing direct threat to indigenous biodiversity (Adhanom Negassi Eds, 1999).

6.1.2 Possible Strategies and Action Plans

Assessment of socio-economic impacts of invasive species is very critical to better integrate the above emerging issues into national development and environmental planning processes. The assessment should include:

- The biology of the species;
- Its current distribution and density in the selected geographic area, and the likelihood of its spreading to adjacent areas;
- The full range of impacts of the invasive species on the quality and quantity of goods and services normally provided by the land or water body concerned - for example, crop or fisheries yields, fuelwood, grazing, etc;
- The cost and expected impact of available management strategies;
- Networking, exchange of experiences and better understanding of shared challenges with neighbouring countries;

- Support for field and strategic projects by exploring similar models, developing cooperation and learning new techniques;
- Involvement of other regional invasive species programmes and partnerships;
- Identification of critical issues and expert exchange needs with neighbouring countries; and
- Development of action plans for priority issues

6.2. Climate Change and Adaptation

6.2.1 Key emerging Issues in Eritrea

The UNFCCC was acceded by Eritrea on 24 April 1995, and entered into force on 23 July 1995. Department of Environment of Ministry of Land, Water and Environment is the National Focal Point of the Convention. In response to the obligations under Article 4 Paragraph 1 and Article 12 Paragraph 1 of the Convention, Eritrea has prepared its Initial National Communication (EINC) under the UNFCCC during 2001. Since the ratification of the Convention (1995), significant progress has been made in the implementation of UNFCCC in Eritrea. The most important ones are preparation of National Communications pursuant to Article 4.1 and 12.1 of the Convention and Preparation of the National Adaptation Programmes of Action (NAPA) under the Least Developed Countries Fund (LDCF). Eritrea is now in the process of preparing its Second National Communication (SNC).

As identified by the INC and NAPA studies, the groups that are most vulnerable to climate risks are those that directly depend upon natural resources for their livelihood. Women, children, and elderly people are the most affected in any group. A brief description of each vulnerable group appears below.

- ❑ *Subsistence farmers:* These include rain-fed and spate and well-irrigated farms. Subsistence rain-fed farming is particularly vulnerable to climatic hazards due to the low adaptive capacity and practices that are increasingly incompatible with climatic variability. Small-scale irrigation farmers are also vulnerable because decreased rainfall and drought reduce the availability of irrigation water thus affecting productivity. Flooding also destroys wells and other irrigation infrastructure. Spate irrigation is widely practiced in the eastern lowlands of Eritrea.
- ❑ *Rural dwellers:* Forest or woodland-dependent rural inhabitants are also highly vulnerable. People that harvest gum and incense, as well as women that derive their livelihoods by weaving doum palm leaves and selling wood and other forest products are also vulnerable social groups.
- ❑ *Pastoralists:* Pastoralists are most impacted by recurrent drought, through reduced livestock production and reduced livestock products such as milk.
- ❑ *Urban poor:* The urban poor are vulnerable to thermal stress and sea level rise through destruction of livelihood activities, price increases in local market, increases in diseases such as Acute Respiratory Infections (ARIs), shortage of water both in quantity and quality due to drought and salt water intrusion and shortage of fuel wood is widely experienced in the eastern lowlands and coastal areas of Massawa.
- ❑ *Fishermen:* Artisanal fisheries will be vulnerable to sea level rise in different ways through low harvests that result from erosion and sedimentation of the coral reefs and mangroves, which are breeding sites for fisheries.
- ❑ *Island residents:* Inhabitants of Eritrean islands in the Red Sea are vulnerable to climatic hazards through growing shortages of fresh water both in quantity and quality due to saltwater intrusion.

While each of the above mentioned communities are already adversely affected to some degree, long-term climate change will deepen their vulnerability to a variety of health impacts. The most highly impacted will be people with low immunization, refugees, rural children, pregnant women, pre-school children and people living in dust storms (Kamsin) areas.

6.2.2 Possible Strategies and Action Plans

The following strategies are recommended to integrate climate change concerns into national development planning:

- The NAPA and the National Communication process can serve not only for reporting to the UNFCCC, but also as a strategic tool for mainstreaming climate change concerns into national development planning;
- The potential of the national communication process to generate policy-relevant knowledge and deliver institutional and technical capacity building, public awareness raising, stakeholder engagement and “political buy-in” should be maximized for the benefit of managing climate risk at national and sectoral level within the context of national development planning;
- There are notable technical, institutional and financial barriers to integrating climate change adaptation. Technical and policy support and public awareness raising are needed to remove such barriers; and
- Initiate stakeholders to use NAPA, INC and SNC documents as a basis for project concepts and developing “fundable projects”; and
- Develop national climate change adaptation strategies.

6.3 Genetically Modified Organisms (GMOs)

GMOs are the products of biotechnology. Eritrea needs to put biotechnology and biosafety regulatory mechanism in place to enable it check and control the safe transfer, handling and use of the products of Biotechnology. To this effect, drafting a National Biosafety Framework, which enables the country to make technical, political and local decisions on these issues, is very crucial and timely. This practice will help Eritrea to build its capacity for assessing and managing risks, establishing adequate information systems, and developing expert human resources in the field of Biotechnology and Biosafety.

6.3.1 What are the Public Concerns on Biotechnology?

Biotechnology potentially offers great benefits to both developed and developing countries, enabling biological resources to make much greater contributions to human welfare. Over 1.3 million people in the world ate food from GM crops, which are grown in 44.2 million hectares during the year 2000. Trials are also underway with most commercial crops and plants. No safety incidents were reported to date.

Many people however, are concerned that greater uses of the products of biotechnology are not without risks to biological diversity and human health. Such risks will have to be identified and appropriately managed or controlled before new products enter the environment. The major public concerns regarding biotechnology are:

- Ethics of genetic modification and the interference with nature;
- Safety of food and of introducing genetically engineered organisms into the environment;
- The alleged radical novelty, unpredictability, or irreversibility of biotechnology;
- Possible negative impacts on employment and small farms;
- Trust or lack of trust of government regulatory agencies;
- Enhancement of corporate power and ownership of intellectual property (IP); and
- Possible exploitation of developing countries.

6.3.2 Possible Strategies and Action Plans

Though GMOs do not pose immediate significant threat in Eritrea, we need to regulate biotechnology for the following reasons:

- The products of biotechnology are living GMOs;
- During research and development GMOs are confined;
- As living entities, GMOs can spread and replicate once released into the environment;
- Thus, before release, an assessment of their impact on the environment must be undertaken;
- Human safety assessment is mostly universal (e.g. the amount of maize consumed in Africa is by far higher than that consumed in Europe and hence the impact cannot be the same);
- Animal and plant impact must be determined in the growing area, thus, assessments shall be made nationally;
- Impact on soil, water, and air is assessed nationally; and
- Non-safety issues sometimes need to be assessed at national level before approval for GMO. These include national needs, socio-economic impact, sustainable utilization of the GMO, trade, ethics, labor, etc.

6.4. Carbon Trade

Improved stoves “Mogogo” helps to minimize problems caused by the traditional stoves “Mogogo” and the prevalence of household energy problems, The Energy Research and Training Center in Asmara developed an improved stove, which combines the advantages of the traditional “Mogogo” design with more advanced design techniques and has so far disseminated 22,000 nationwide since 2005.

Efficiency improvement of traditional woodstoves is promising. Each improved stove reduces fuel wood consumption by 21 % and reduction of 0.6 tone of CO₂ per year. This is being introduced in the Clean Development Mechanism (CDM) mechanism. The Greenhouse Gas (GHG) inventory may provide the greatest source of ideas for mitigation analysis; therefore a solid understanding of GHG inventory methodologies is crucial for identifying good CDM project concept.

6.4.1 Possible Strategies and Action Plans

To identify projects that are potential to carbon trading needs mitigation assessments. These should include:

- Information on the barriers to, and opportunities for, implementation;
- Identify the most necessary requirements for implementing mitigation options, such as: financial support, assessment of technologies for the different mitigation options; institutional capacity-building to sustain mitigation work; regulatory policies; and/ or improvements of the national decision-making framework;
- Support the development and enhancement of endogenous capacities and technologies in cooperation with the developed countries;
- Promote renewable energy resource assessment and pilot projects;
- Enhance the capacity of the Energy Research and Training Center of the Ministry of Energy and Mines; and
- Develop GHG mitigation Plan in key source categories such as energy, transport and Land use and Land use change and forestry in Eritrea.

6.5. HIV/Aids

Although HIV/AIDS is not an environmentally related disease, it incapacitates and kills young and middle age adults, who are at their most productive age. Therefore, AIDS has an impact on household structures; incomes; labour and cost of caring for people with AIDS are high. Family members also suffer; young children who lose their mothers to AIDS are more likely to die themselves and there is a growing population of “AIDS Orphans” in Eritrea. So it has an impact on government expenditure.

HIV/AIDS is one of the fatal infectious diseases that was first reported in Eritrea in 1988. Since then, the incidence and prevalence had been steadily increasing (MoH, 2004).

In Eritrea, like in most of sub-Saharan Africa, HIV transmission is predominantly heterosexual contact, accounting for over 95 %.

6.5.1 Existing Strategies

To combat HIV/AIDS, the Ministry of Health is implementing multi-sectoral approach strategy where each sector implements its share in preventing and controlling the infection. Almost all line ministries; NGOs and partners are involved in the five-year HAMSET project that includes HIV/AIDS, Malaria, and Sexually Transmitted Infections and Tuberculosis. Some of the interventions to combat HIV/AIDS include promoting:

- VCT (Voluntary Counselling & Testing);
- PMTCT (Prevention Mother to Child Transmission);
- Care & Support;
- Clinical Care, ART & PEP;
- Diagnosing and Treating STI (Sexual Transmitted Infection);
- BCC (Behavioural Change Communication);
- Capacity building, management skills;
- Targeted interventions;
- Research, surveillance, M&E; and
- Infection Prevention Safety of Blood & Blood transfusions and others.

6.6 Effects of Globalization

In Eritrea globalisation has had both negative and positive effects. The most important negative effects of globalisation, however, are on the culture of the people and the economy of the country.

6.6.1 The demands of globalisation

Globalisation in Africa involves one fundamental project: that of opening up the economies of all countries freely and widely to the global market and its forces².

In Africa, all the central planks of the process of globalisation have been implemented over the past decade-and-a-half as structural adjustment programmes. Countries have deregulated foreign investment, liberalized their imports, removed currency controls, weakened the direct economic role of the state, and so on. The results have been to further undermine the internal, national productive capacity, social security and democratic integrity of these countries. So far that is how globalisation has impacted on Africa³.

² *ECHOES* is an occasional publication of the WCC *Justice, Peace, Creation* team

³ *Ibid.*

The effect globalisation has on culture is also immense and diverse as it has affected people's cultural behaviours in different ways.

Although globalisation has encouraged free trade, economic integration and competition, the main beneficiaries so far have been the advanced developed countries. Though it needs an in-depth analysis, the situation in Eritrea seems different from those of other countries in terms of the effects of globalisation. The Government of Eritrea has adopted the policy of self-reliance on the economic field. It is believed that the pursuance of a policy of self-reliance is essential for full independence of a country both economically and politically, and that economic self-reliance is the essential factor in realizing self-reliant development in all other fields. This can be done by mobilizing its own resource and by depending on its own material and human resources to assure the venue of development. Although this approach has had positive outcome, nevertheless it has also slowed economic development.

6.6.2 Possible Strategies

Whatever the nature of Eritrea's economy, its level of development, and position in the global economy, Eritrea must pursue a common set of economic policies, which have been articulated in its "*Transitional Economic Growth and Poverty Reduction Strategy (2001)*", which lays out the government's policies for macroeconomic management, steps to create the conditions for economic growth, and policies and programs to ensure that growth is widely shared. Obviously this has to be modified in line of experience gained.

In particular, it must concentrate on exporting what it is supposed to be good at; reduce the role of the government in the economy to that of supporting the market and private enterprise.

Conflicts, Insecurity and Environment

At the end of thirty years of war for independence significant number of Eritreans returned back home to play their part in rehabilitation and economic development. However the promising economic progress was disrupted due to the outbreak of the border conflict with Ethiopia in May 1998. The attendant insecurity had disrupted the promising growth of the economy and destroyed infrastructure, businesses and farms, schools, clinics and houses. For example the areas most affected by the war, Gash-Barka and Debub are also the nation's agriculturally most productive accounting for about 70 percent of total grain output. The fighting and widespread displacements prevented farmers from planting crops.

The other sense of insecurity is drought, which was severe during 1998-2000 and had always affected the country intermittently over the last few decades.

The conflicts, insecurity and environmental degradation have affected the poor substantially. Since the poor, who are often dependent on more marginal areas, have less ability to cope with environmental shocks than do the non-poor. They have fewer assets to sell, which would enable them to smooth their consumption, and have fewer options for gaining income elsewhere and they often have less information about impending disasters or capacity to respond to whatever information they do have.

Disasters clearly exacerbate economic deprivation in the short term; they can also compromise a household's long-term economic well being if survival requires the sale of assets, such as those the family had planned to use to finance their children's education.

The western lowlands of Eritrea have vast tracts of agricultural land and consequently communities, who were displaced from areas of their origin, were resettled in this region, mainly because of the presence of vast tracts of fertile agricultural land and of cultural affinity of the returning refugee population with the host community. However the impact of returnees and internally displaced persons (IDPs) on the environment has been alarming. Because of their presence in large number their impact on deforestation, soil erosion and degradation of water resources are very significant.

The most serious environmental problem created by returnees and IDPs in Gash Barka region is extensive deforestation within and around all the campsite and resettlement villages. The main cause of deforestation is due to the excessive consumption of fuel wood for domestic purposes and their excessive dependence on wood for the construction of traditional houses (temporary shelters). This could also result in the loss of some endemic species and loss of biodiversity. The other major environmental problems caused by resettlement of returnee's are ground and surface water pollution due to solid and liquid waste discharge.

6.7.1 Potential environmental strategies during conflict and insecurity events

Environmental action plan should be prepared for addressing problems related to interactions between returnees and internally displaced persons (IDPs) during the war period. This plan of action should address the following components:

- Promotion of alternative fuels;
- Promotion of alternative building materials;
- Plans for afforestation;
- Settlement planning;
- Development of efficient waste management system;
- Formulation of environmental guidelines for resettlement of returnees and IDPs; and
- Environmental awareness, education and training.

7. KEY RECOMMENDATIONS, QUESTIONS, WHICH NEED FURTHER ADDRESS AND CONCLUSION

The following recommendations are suggested to enhance the contribution of natural resources for the achievement of the government's objective of achieving food security, poverty reduction and achieving sustainable development:

- MDGs, NSSD and PRSP should build on existing work rather than being new, stand-alone documents;
- Environmental sustainability and poverty reduction objectives should be integrated into mainstream development policy, rather than being 'add-ons';
- Implementation should be considered not only at the national level but also at sub-national, district, local levels, etc, the case of NAPA is a good example;
- Consultation and participation should be balanced with sound analysis (desk-based analysis, there is ample lesson and good practice for this issue from NAPA);
- While donors such as UNDP/GEF can help co-ordinate, Zoba administrations and other regional stakeholders must own livelihood related projects, MDGs, NSSD, NAPA, NCSA, PRSP, UNCBD, UNCCD, etc processes;
- It is vitally important to build local capacity for the design and implementation of MDGs, NSSD, PRSP, NAPA and NCSA follow activities; and
- Environmental costs should be internalized through the development of appropriate policies and incentive structures.

It should also be noted that existence of natural resources alone could not achieve the MDGs and PRSP without ensuring the sustainability of the other assets of livelihood including Human, Physical, Social and Financial Capitals.

In order for rural people and communities to be able to process and value add on natural resource products and can fairly and equitably enter the market place the following have to be fulfilled:

1. Managerial expertise, including expertise in institutional development and negotiation, is crucial to the long-term sustainability of enterprise projects. In many poor African countries managerial expertise is in short supply.
2. Ensuring market access is crucial for the success of enterprise planning.
3. Quality control mechanisms should be established and their importance emphasized.
4. To ensure project sustainability, there must be a participatory process whereby community-based resource management is encouraged.
5. Communities must also have access to technical, managerial and marketing expertise to benefit economically from resource use, in order to manage these resources effectively.
6. Conservation activities are more likely to be successful when economic incentives are provided from the start.

The following actions are required to improve the efficiency of input provision services by the government and other stakeholders:

- Policy on input price to influence the price paid by farmers and to improve the physical flow of inputs;
- Policy on access to credit that concerns the financial institutions and willingness to lend money to farmers for the purchase of these inputs;
- Information (marketing and credit) available to farmers concerning the type and quality and combination of inputs for their farm systems.

The main questions that need to be addressed are the following:

5. How can National Food Security be achieved sustainably and can international food assistance be used more efficiently and effectively?
6. African countries are carrying out major promotional campaigns not only internationally but also regionally for markets, however it seems a daunting task as even the Western countries are protecting their markets. What can be done to resolve this issue?
7. Although no nation can claim to be totally self-reliant it is believed that self-dependence enhances people's independence of thinking, innovativeness, perseverance and pride in work and these attitudes permit and accelerate economic development. Hence can one say that the policy of self-reliance is a fallacy?
8. Can natural resource governance and sustainable development and livelihood improvement be achieved in countries that do not practise good governance?

ANNEXES

ACRONYMS

AMRF	Assessment and Management of the Riverine Forest
ARIs	Acute Respiratory Infections
Baito	Local Assembly
CC	Climate change
CDM	Clean Development Mechanism
CMI	Coastal, Marine and Island biodiversity
COMESA	Common Market for Eastern and Southern Africa
DANIDA	Danish International Development Assistance
Diessa	Communal Land Ownership
DNRG	Decentralized Governance of Natural Resources
DoE	Department of Environment
EC	European Community
ECMIB	Eritrean Coastal Marine and Islands Biodiversity Project
EIA	Environmental Impact Assessment
EINCCC	Eritrea's National Communication on Climate Change
ENDF	Eritrean National Desertification Fund
ENR	Environmental Natural Resource
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gases
GoE	Government of Eritrea
GMOs	Genetically Modified Organisms
HYV	High Yielding Varieties
ICZM	Integrated Coastal Zone Management Plan
IDPs	Internally Displaced People
IGAD	Intergovernmental Authority on Development
INC	Initial National Communication
IRDP	Integrated Rural Development Program
LDC	Least Developed Countries
LDCF	Least Developed Countries Fund
I-PRSP	Interim Poverty Reduction Strategy Process
LSMS	Household Living Standard Measurement Survey
LRP	Local and Regional Procurement
MDG	Millennium Development Goals
MEA	Multilateral Environmental Agreements
MoA	Ministry of Agriculture
MoE	Ministry of Education
MoEM	Ministry of Energy and Mines
MoF	Ministry of Finance
MoFish	Ministry of Fishery
MoH	Ministry of Health
MoLWE	Ministry of Land, Water and Environment
NAP	National Action Program
NAPA	National Adaptation Program of Action
NBSAP	National Biodiversity Strategy and Action Plan
NCSA	National Capacity Needs Self-Assessment
NDP	Net Domestic Product
NEAPG	National Environmental Impact Assessment Guidelines and Procedures

NEMP-E	National Environmental Management Plan
NGO.....	Non Governmental Organizations
NRA	National Resource Accounting
NSSD	National Strategies for Sustainable Development
NSEO.....	National Statistics and Evaluation Office
NTFP.....	Non Timber Forest Products
PPA.....	Participatory Poverty Assessment
RET	Renewable Energy Technologies
RNR	Renewable Natural Resources
SEA.....	Strategic Environmental Assessment
SNA.....	System of National Accounts
SNC	Second National Communication
SoE-R	Draft State of Environment Report of Eritrea
Sub-Zoba	Sub-Regional or District Level Administration
TEGPRS	Transitional Economic Growth and Poverty Reduction Strategy Paper
UNCBD	United Nations Convention on Biodiversity Conservation
UNCCD	United Nations Convention to Combat Desertification
UNDP.....	United Nations Development Programme
UNFCCC.....	United Nations Framework Convention on Climate Change
WFP	World Food Programme
Zoba.....	Regional Administration

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Useful websites on environmental issues www-esd.worldbank.org/
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