USAID/REDSO/ESA Strategy
Environmental Threats and Opportunities Assessment with Special Focus on Biological Diversity and Tropical Forestry

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Executive Summary

To undergird its strategy, REDSO undertook an Environmental Threats and Opportunities Assessment, and identified issues and opportunities for adding value to the strategy through integration of environmental considerations. **Environmental technical analysis is judged to be optional for global or regional strategies that cover multiple countries** (ADS Ch. 201-3-3.10, "revised vetting draft "May 2000). Notwithstanding any questions as to requirements, conduct of this Assessment brings the REDSO Strategic Plan into technical compliance with the environmental legal framework applicable to USAID strategic planning, including Sections 118 (Tropical Forests) and 119 (Endangered Species) of the Foreign Assistance Act. Likewise, the integration and application of USAID's Environmental Procedures (22 CFR 216) into all USAID's obligation actions serves also to advance the environmental soundness of REDSO's and the region's bilateral missions' programs.

REDSO has taken seriously the desire to promote programming in a fashion that is as environmentally sustainable as possible, through an integration of its core and technical services in environment and natural resources with the regional E/NRM component of the Food Security S.O. The environmental compliance function promotes environmental quality throughout the region's operating units, and is staffed by an FSN position and 50 % of one professional staff. The other 50 % of the latter professional's time is devoted to transboundary environmental programming. An additional PSC and one FSN support the E/NRM regional programming functions. Together, these constitute REDSO's "Environment/ Natural Resource Management" team, which works with all the other operating units in the region.

While REDSO can serve a useful role in ensuring a continued appropriate ESA regional response to environmental issues, given REDSO's designated GHAI coordination and technical services roles, and very limited staffing, development of an "environmental" SO was not deemed appropriate. On the other hand, *all* REDSO SOs, and those of the region, are assisted in considering the environmental implications of their activities. With a strategy designed to address regional food insecurity and recurrent conflict, given the environmental roots of these problems, **REDSO, in order to succeed, must ensure that environmental considerations are fully integrated into its strategy.** Integration means more than having an E/NRM team with its own activities. Integration means that each REDSO SO, office, and team must work with the E/NRM Team to be cognizant of the environmental issues, potential impacts, and integrative strategies relevant to their sector when considering the design, implementation and monitoring of activities.

Section 2 "ESA Regional Environmental Threats" provides an overview of environmental assets, issues, and threats from country-level and regional perspectives, and in the context of thematic areas relevant to the requirements of the Assessment and the needs of REDSO: Biodiversity; Tropical Forests; Freshwater and Marine Resources; Watershed Perspective; Conflict and the Environment; Food Security and the Environment; Health and the Environment; and Institutional Context.

As specifically concerns biodiversity and tropical forest resources, the ESA region contains significant biodiversity resources. For example, three of Conservation International's biodiversity *hotspots* are located within the ESA region. Common threats to ESA region biodiversity and tropical forests resources are discussed. The collective mission response to regional environmental threats is significant and appears generally appropriate. Of particular note is the large focus on biodiversity conservation in countries identified as priority biodiversity (and also tropical forest) areas.

Section 3 "REDSO Strategic Response" reviews the context for REDSO's actions, and considers each component of the strategy in terms of environmental issues, including appropriateness of strategic

choices; potential impacts of activities; issues of environmental compliance; and opportunities for integrating and linking environmental activities and considerations both within REDSO's portfolio and with other USAID activities in the region.

The U.S. development interests that frame the Greater Horn of Africa Initiative (GHAI) and define REDSO's principal strategic focus provide the framework for the strategy. While the GHAI has determined principal strategic directions, numerous opportunities exist for addressing environmental issues within REDSO's strategy. For REDSO's three strategic objectives (SOs); non-presence country activities; and support services, environmental issues and opportunities are presented and discussed. The following highlights some such opportunities for selected REDSO's strategy components:

SO#5: Enhanced African Capacity to Achieve Regional Food Security

- Acknowledge and incorporate link between environmental security and food security in activities;
- Incorporate biodiversity conservation concerns and approaches in agricultural production activities;
- Target areas important for both food security and biological diversity;
- Promote use of trade standards as opportunities to leverage environmental gains;

Regionalize perspectives to account for transboundary nature of ecological systems.

SO#6: Enhanced Capacity for Managing Conflict in the Region

- Raise awareness among GHA mission on the environmental dimensions of conflict;
- Continue work with civil society groups with environment-related agendas as entry points for promoting control over local resources;
- Continue interactions with the Food Security (SO#5) Team that highlight the relationship between conflict and food security.

SO#7: Enhanced Regional Capacity to Improve Health Systems

- Promote integration of environmental health into other "sectors" SOs;
- Target population activities in ecosystems that have high biodiversity; high population density; degraded natural resources; or high food production potential).

SO#8: Effective Services to ESA Missions and Support to Regional Partners

- Promote an understanding of the environmental impacts and mitigation strategies related to the administration of food aid and relief assistance;
- Enhance regional tracking system for environmental compliance of USAID activities;
- Promote and support application of the environmental legal framework for strategic planning during bilateral mission plan development;
- Promote and support interaction between Mission Environment Officers and Environment and Natural Resource Officers in the ESA region;
- Prioritize support to missions in terms of opportunities for convergence of activities with the GHAI;
- Consider international environmental agreements as possible entry points for promoting regional approaches to environmental management.

SO#9: Effective Delivery of U.S. Government Assistance to Non-Presence Countries (NPC)

- Development of ISPs should follow the model of the Sudan ISP, which incorporated a general review of environmental issues up front.
- To identify potential environmental consequences, and to promoter for sound planning, of the wide range of small-scale activities to be supported, an environmental screening and review process should be employed., as it also builds local capacity in environmental assessment.

This ETOA is supported by additional information contained in six tables presenting country- and regional level environmental information, as well as a list of reference documents.

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Annexes

1. Purpose of Environmental Threats and Opportunities Assessment

This Assessment supports REDSO/ESA's Strategic Plan by performing two related functions: (1) reviewing plan components within the context of regional environmental threats and identifying issues and opportunities for adding value to those components through environmental considerations; and in doing so, (2) complying with the environmental legal framework[4] and technical area guidance applicable to strategic planning.[5] It should be noted that the language of this framework is targeted towards bilateral mission programs and Country Strategic Plans (CSPs). REDSO's role as implementation coordinator of the regional Greater Horn of Africa Initiative, together with its broader support mandate within the eastern and southern Africa (ESA) region, provides REDSO with an opportunity to creatively – and proactively – apply the environmental framework.

This Section 1 reviews the relevant laws, regulations, and guidance that comprise the environmental legal framework for USAID strategic planning, focusing on its applicability to REDSO's mandate and regional perspective.

1.1. Legal Basis

The core environmental requirements for USAID operating unit strategic plans are spelled out in ADS 201.5.10g and accompanying Supplementary References are derived principally from Sections 117 through 119 of the Foreign Assistance Act (FAA). . However, recent guidance indicates that environmental technical analysis is judged to be *optional* for global or regional strategies that cover multiple countries (ADS Ch. 201-3-3.10, revised vetting draft, May 2000). Notwithstanding any questions as to requirements, conduct of this Assessment brings the REDSO Strategic Plan into technical compliance with the environmental legal framework applicable to USAID strategic planning. Likewise, the integration and application of USAID's Environmental Procedures (22 CFR 216) into all USAID's obligation actions serves also to advance the environmental soundness of REDSO's and the region's bilateral missions' programs.

22 CFR Part 216 codifies the Agency's procedures "to ensure that environmental factors and values are integrated into the A.I.D. decision making process." Accordingly, USAID conducts assessments to ensure that its environmental priorities are incorporated into results planning, achieving, and monitoring.

1.1.1. FAA Section 117/USAID Environmental Regulations

Section 117 "Environment and Natural Resources," dictates that efforts be made to maintain (and restore) natural resources upon which economic growth depends, and to consider the impact of USAID's activities on the environment. This law requires USAID to include environmental sustainability as a central consideration in designing and carrying out its development programs. The legal requirements of Section 117 are referred to in USAID's *ADS Chapter 204 "Environmental Procedures,"* which provides essential procedures and policy on the application of *22 CFR Part 216* ("Reg. 216"), which codifies USAID procedures to ensure integration of environmental considerations into decision making processes. Accordingly, USAID conducts various types of assessments to ensure that its environmental priorities are incorporated into results planning, achieving, and monitoring. Raising the scope of assessments to a more general level, 22 CFR 216.6(d) provides for programmatic environmental assessments applied to classes of actions. This clause allows USAID to conduct environmental assessments of strategic plans and thereby achieve an initial level of compliance. Clearly,

[4] The "environmental legal framework" refers to federal statutes and USAID regulations and guidelines related to the environment.

[5] Cable on the subject of "Supplementary guidance for REDSO Strategic Plan Parameters" was explicit on the issue of compliance: *"Mission is reminded to demonstrate compliance of the new strategy with Reg. 216 and to undertake the analysis required under Sections 118 and 119 of the FAA."*

the planning stage is the first and best opportunity to ensure that such factors are appropriately considered. This will allow a subsequent series of measures to be identified which will incorporate environmental soundness into development programming, including downstream environmental review, screening, mitigation, prevention and monitoring actions.

1.1.2. FAA Sections 118 and 119

Section 118 "Tropical Forests" and *Section 119 "Endangered Species"* of the FAA codify more specific U.S. interests in preservation of specific environmental assets – tropical forests and biodiversity – the continued loss of which constitutes a long-term threat to the global environment. These two statutes require that USAID country plans include analyses of the actions necessary to conserve tropical forests and biodiversity; and a discussion of the extent to which proposed USAID actions meet those needs. Section 118/119 analyses are specific legal requirements of all bilateral CSPs.

1.1.3. USAID Guidance

ADS Chapter 201 "Managing for Results: Strategic Planning" translates the intent of the above legal requirements into a practical strategic planning approach, and provides a priority-setting framework for missions to use in determining environmental threats and opportunities (See Supplementary References, *Guidelines for Strategic Plans, Technical Annex B: Environment,* ADS 201-51.m2*)*. The priority-setting process is intended to guide the setting of environmental strategic objectives, as well as to inform strategic objectives in other sectors.

1.1.4. Environmental Threats and Opportunities Assessment Process

The priority-setting framework provides a flexible approach to evaluating environmental issues and their relevance to USAID's Agency-wide strategic environmental goals:

- *Reducing threats to the global environment, particularly loss of biodiversity and climate change; and*

- *Promoting sustainable economic growth locally, nationally, and regionally by addressing environmental, economic, and developmental practices that impede development and are unsustainable.*

The priority-setting process, here termed an *Environmental Threats and Opportunities Assessment,* includes three steps: (1) assessment of the severity of environmental problems; (2) evaluation of the potential effectiveness of strategies to address these problems; and (3) identification of opportunities for sustainable impact. This process is intended to lead to both creation of "environmental" strategic objectives (SOs) and to identification of opportunities to address environmental issues under SOs in other sectors.

1.2. Application of Legal Requirements to REDSO Strategy

Both the FAA and the ADS and its Supplementary References clearly focus on bilateral mission, country-specific programs. Due to the regional and directed nature of its mission, REDSO must first interpret, adapt, and apply these requirements in a way that will add value – and legal compliance -- to its new strategy.

1.2.1. Applying FAA Sections 118 and 119

The intent of Sections 118 and 119 is that USAID give priority consideration to tropical forestry and biodiversity in its development programs. However, given the country-level focus of the analysis requirements of these statutes (as well as the derivative USAID guidance), it is logical to ask: *"are Section 118/119 analyses legal requirements for the REDSO strategy?"* Consultations in

USAID/Washington revealed opinions on both sides of this issue. Notwithstanding these interpretations, it was felt that an appropriate level of analysis would serve to inform and strengthen the REDSO strategy. The analysis approach taken must consider REDSO's regional role, and the geographic overlap with USAID country programs. If both the regional and bilateral operating units equally apply the analysis requirements, the geographic overlap means that there will be duplication of efforts. Therefore, as part of its regional perspective, REDSO must consider the response of individual bilateral mission strategies and programs to national and regional environmental threats, as well as the collective regional USAID bilateral response to those threats (e.g., USAID/Kenya 2000).

To illustrate, the ESA region clearly contains significant tropical forest and biodiversity assets, much of which is under vary degrees of threat. In developing their CSPs, many of the USAID bilateral missions in the region appear to have adequately considered the requirements of the FAA, as evidenced by the analyses incorporated into their CSPs, and moreover, by the creation of tropical forest and biodiversity SOs or components of SOs (i.e., Kenya, Madagascar, Namibia, Tanzania, Uganda, Zambia, Zimbabwe). Bilateral missions have both the comparative advantage and greater manageable interest for country-level programming. REDSO's analysis agenda should then focus on the following questions:

(1) Are ESA missions appropriately applying FAA analysis requirements to their CSP process and into country programs?;
(2) Is the "big picture" ESA regional response to tropical forests and biodiversity threats rationally targeted?; and
(3) How can REDSO's own programs incorporate or integrate elements of tropical forest and biodiversity conservation, and/or "mainstream" environmental soundness aspects?

1.2.2. Applying FAA Section 117 and the ADS (including Reg. 216)

The intent of Section 117 and Reg. 216 is to ensure that *all* USAID programs (regional, national, or local) consider the environment in the planning of activities. While ADS 201 and Guidelines do focus on country programs, here, REDSO's responsibilities are clearer. In terms of REDSO's own programs (i.e., regional activities managed by REDSO), this means considering the environmental implications of planned activities in terms of both potential impacts and perhaps more strategically important, *opportunities for linking and integrating environmental concerns and activities into all elements of REDSO's development program.*

REDSO also holds the critical responsibility and strategic opportunity for promoting environmentally sustainable development across the ESA region in its role of assisting and monitoring regional compliance with Reg. 216 and associated guidance. This role applies to ESA bilateral mission programs, REDSO's own regional portfolio, and can incorporate broader opportunities for building capacity in environmental assessment across the region. Therefore, this Assessment will also consider this REDSO "Core Support Service" in terms of an opportunity to promote integration of environmental concerns into ESA national and regional development.

1.2.3. The Assessment

The remainder of this Assessment is divided into two sections. Section 2 "ESA Regional Environmental Threats" provides an overview of environmental assets, issues, and threats from country- and various regional-level perspectives. Section 3 "REDSO Strategic Response" reviews the context for REDSO's actions, and considers each component of the strategy in terms of environmental issues, including appropriateness of strategic choices; potential impacts of activities, issues of environmental compliance, and opportunities for integrating and linking environmental activities and considerations both within REDSO's portfolio and with other USAID activities in the region.

2. ESA Region Environmental Threats

For the purposes of review, and in consideration of REDSO's mandate, ESA client countries are divided into those within the Greater Horn of Africa (GHA), where REDSO will focus most of its programs, and those in southern Africa. However, this section attempts, where possible, to treat issues from a regional perspective. The resource endowments reviewed in this section, together with their associated threats, are in fact mostly transboundary concerns. Such a regional approach to dealing with environmental issues makes perfect sense to environmentalists, who know that ecological units – the areas within which development and conservation concerns interact, are defined by biophysical as opposed to political boundaries. It is in this context as well, that the regional approach espoused by REDSO holds promise in addressing the environmental threats in the ESA region.

Categories of Missions and REDSO Presence in Eastern and Southern Africa Region

Greater Horn of Africa region sustainable development missions served by REDSO (which also coordinates GHAI functions and reporting): Kenya; Uganda; Tanzania; Rwanda; Eritrea; and Ethiopia,

REDSO supports programs in four "**Non-Presence Countries** (NPC)" [i.e., countries without presence of a USAID Mission but in which certain institutions receive USAID assistance]: Djibouti, Sudan; Somalia; and Burundi.

REDSO client missions in **southern Africa** include: Madagascar; Malawi; Mozambique; Zimbabwe; Zambia; Botswana (RCSA); South Africa; Namibia; Angola; and in **central Africa**, the Democratic Republic of Congo (DRC).

REDSO serves in the Controller function for certain activities in the **Western Indian Ocean island nations**: the Comoros Islands, Mauritius, and the Seychelles.

It is challenging enough to comprehensively characterize the environmental qualities and associated threats within a given country or ecosystem. Attempting such a characterization across the entire ESA region, then, is not an appropriate objective, given REDSO's limited resources, mandate and manageable interest. Nor is such a level of study to be expected for this Assessment. This Section 2 focuses on identification of key issues, trends, and threats of particular interest for either legal reasons (i.e., FAA analysis requirements related to biodiversity and tropical forestry) or to the strategic needs of the REDSO program (e.g. environmental issues of particular relevance to conflict and food security). Also, given REDSO's regional mandate and geographic overlap with ESA country USAID field missions, a brief review of country environmental programs is presented. This Section is structured as follows: Section 2.1 provides an overview of the region's environmental endowments and associated threats; and Section 2.2 describes the current response of USAID bilateral missions. Information presented in this section is supported by six tables annexed to this document that contain country-level and regional information (Annex D). *It should be noted that the tables contain much country-specific information not included in the text. Review of the tables will help the reader to better understand individual country situations, as well as the overall ESA situation.*

2.1. ESA Environmental Assets and Threats

This Section reviews issues in the context of thematic areas relevant to REDSO (and FAA)

requirements: Biodiversity (2.1.1); Tropical Forests (2.1.2); Freshwater and Marine Resources (2.1.3); Watershed Perspective (2.1.4); Conflict and the Environment (2.1.5); Food Security and the Environment (2.1.6); Health and the Environment (2.1.7); and Institutional Context (2.1.8). In view of REDSO's mandate of coordinating implementation of the Greater Horn of Africa Initiative (GHAI), where appropriate, the review of threats and issues focuses on the GHA and its countries.[6]

2.1.1. Biodiversity Resources

The ESA region contains significant biodiversity resources. The region itself covers a large part of Africa, encompassing a vast range of ecosystems. A significant and growing amount of country-level information on species richness exists (WRI 1998; IUCN 1990, 1993; Shumway 1999; and others). Tables 3, 4, and 5 (see Annex D) contain selected country-level species data. Several efforts have identified, quantified, and prioritized biodiversity resources by habitat type, country, region, and associated threats. Three such efforts are highlighted here, following by a discussion of threats to ESA biodiversity resources.

Conservation International, based on species numbers, endemism, and threats, identified 25 "Biodiversity Hotspots" for terrestrial biodiversity.[7] Three *hotspots* are located within the ESA region: (1) Madagascar and the Indian Ocean Islands; (2) the Succulent Karoo region of South Africa's Cape; and (3) the Eastern Arc Mountains and Coastal Forests of Kenya and Tanzania.

The *International Union for the Conservation of Nature* (IUCN, 1990, 1993) identified key areas for biodiversity conservation in Africa based on phytochoria[8], and also maintains country biodiversity and environmental profiles that characterize national biodiversity assets (and their associated threats). Key areas, with a list of countries within each area and some key characteristics of each are presented as Table 2: Key Areas for Biodiversity Conservation in Africa - ESA Region (see Annex D). GHA countries with a greater range of phytochoria-based key areas include: Tanzania; Kenya; Uganda; and Ethiopia. The southern African countries with the greatest range of key areas are South Africa and the DRC. Madagascar is characterized as *"the most extraordinary country biologically within the Africotropical Realm"* due to levels of endemism unequalled elsewhere in Africa.

The *USAID* Policy and Strategy for Biodiversity Conservation (1996)[9] identifies key biodiversity regions and countries within various regions of the world. Priority areas within Africa are presented in Table 1: Geographic Priorities for Biodiversity Conservation – ESA Region (see Annex D)**.** Three countries within the GHA are identified as containing priority habitat units for biodiversity conservation: Tanzania; Kenya; and Uganda - each among the world's 50 most species-rich countries, with Tanzania in the top 25. As a region, southern Africa was identified as containing several important habitat units for USAID

[6] Swartzendruber et al (1998) provide comprehensive information on environmental threats and opportunities for the southern Africa region in *Southern Africa Opinions on Environmental Trends and Emerging Issues,* a study performed under the FRAME (Framework for Regional Action and Monitoring on the Environment) Project.

[7] Some areas of the planet - tropical forests in particular - contain exceptional concentrations of the earth's terrestrial biodiversity. According to CI, 1.44% of the earth's land surface contains more than 60% of terrestrial biodiversity. From within these biodiverse areas, CI identified those under the greatest threat as "hotspots," and therefore conservation priorities, under the premise that focused conservation efforts in those sites would be an efficient approach to conservation of global terrestrial biodiversity. See References for website citation.

[8] Phytochoria refer to regional centers of plant endemism and the transition zones between those centers.

[9] The USAID Policy and Strategy for Biodiversity Conservation was never finalized and approved, and left in its 1996 draft state. While this document does not represent USAID policy, it contains useful information on issues, approaches, linkages, and geographic prioritization.

biodiversity conservation. Madagascar was also identified as a priority, containing two major habitat units, and being among the top 25 most species-rich countries. The DRC (also among the top 25) was not considered during the analysis; a field mission is just being started there, and the Africa Bureau Central African Regional Program on the Environment (CARPE) is working with the new Mission regarding appropriate support in the ENV sector. The highly biodiverse and indigenous species-rich Ethiopian highlands also were not considered by the analyses. These countries would be good candidates for future regionally-oriented examination by REDSO and/or USAID Africa Bureau with respect to biodiversity and NRM programming.

Threats to Biodiversity. A review of threats to biodiversity across ESA countries, as documented by USAID ESA missions and various conservation stakeholders, reveals a number of common threats:

Biophysical Factors

- *Growing populations* exert increasing and often unsustainable pressures on resources, particularly in resource-rich, already highly populated areas;
- *Poverty* and lack of alternative livelihood opportunities can lead to households to engage in unsustainable resource mining;
- *Unsustainable small-scale agricultural and pastoral production systems* incompatible with long-term conservation of the resource base may degrade critical habitat;
- *Commercial land use practices* can result in large-scale habitat clearing;
- *Resource harvesting* above sustainable levels can irreversibly degrade biodiverse areas;
- *Climatic change* can result in habitat alteration and degradation;
- *Alien species introductions* can crowd out important indigenous species;
- *Species populations* in some areas may already be below minimum viable size to avoid extinction due to either natural and man-made catastrophes;

Policy, Socioeconomic, Institutional and Financial Factors

- *Debt Servicing* can pressure developing countries into accelerated and unsustainable resource harvesting, such as forest clearing;
- *Weak management institutions* in many countries cannot cope with the financial and managerial demands of biodiversity conservation;
- *Weak environmental legal frameworks* that do not support conservation undermine efforts on the ground;
- *Poor regional cooperation* among countries sharing biodiverse ecosystems jeopardizes conservation of transboundary ecological units; and
- *Insufficient tangible benefits* accruing to local populations from conservation can alienate locals from the resource and create "enemies" of biodiversity conservation.

Much of the ESA region's biodiversity resources have been incorporated into national protected area (PA) systems, many of which provide adequate representation of and protected to national biodiversity assets. With a few exceptions, the collection of national PA systems also fairly represents regional biodiversity resources. However, many PA management institutions are under stress due to: inadequate funding; staffing reductions; corruption; lack of technical capabilities; and lack of empowering legal frameworks. Some PA management authorities have undergone cathartic crises (e.g. Uganda's Forest Department and Wildlife Authority; and Kenya's Wildlife Service); while others in countries in conflict function are only partially functional (DRC; Rwanda) or may not function at all (Sudan; Somalia). Conservation efforts in southern Africa, as measured by financial support and functioning PA networks, appear to be stronger than in the GHA. Elsewhere, **three high biodiversity habitats or regions are among the least effectively protected,** thus are of particular concern: the Tropical Moist Forest (e.g. Central African Rainforests); Afromontane; and Madagascan (Malagasy) regions.

Additional criteria relevant to evaluating threats to biodiversity resources are the degree to and mechanism by which national biodiversity assets are protected, such as: area under varying degrees of protective status; and association with international protection systems (e.g. World Heritage and Ramsar sites; and Biosphere Reserve sites).

Singh et al (1999) used geographic information tools to identify emerging environmental issues in Africa. Findings relevant to ESA biodiversity resources were as follows:

- *Approximately 16 percent of the population reside within 20 km of PAs.* This concentration of people and associated population-based threats place many areas at extreme risk. Singh et al found highest population densities around PAs in Rwanda, Burundi, Uganda (around Lake Victoria), and in part of Kenya, Malawi and Zambia;
- *Transboundary PAs (189 total) are shared by 33 countries.* Uncoordinated PA management policies and uneven technical capabilities threaten the integrity of the larger ecological units.

2.1.2. Tropical Forests

Tropical forests are important for a number of reasons. FAA Section 118 cites several: fuelwood source; protection of biologically productive aquatic resources; protection against flooding; protection of biodiversity; protection against desertification; and protection against global climate change.

Both the GHA and southern Africa regions contain significant natural forest resources. Table 4: ESA Country Forest Resource Profiles (see Annex D) presents regional forest resource information in terms of extent and recent trends. Overall, the southern Africa region contains more natural forest resources than the GHA. However, the inclusion of the DRC in the ESA region confounds comparisons, as the DRC contains a greater area of natural forest that the entire GHA, and represents over half of the southern Africa total.

Additional information is available from WWF's Living Planet Report for 1999 (available on-line: see References), which provides country-level forest (and biodiversity) status figures, and aggregates information to show continent-wide and global trends.

Threats to tropical forests are similar to those against biodiversity (see 2.1.1), with the exception of threats posed by non-viable populations, which are not critical issues for forest resources. Countries of greatest concern in terms of total area of natural forest lost during the period 1981-90 for the GHA and southern Africa regions are as follows:

Natural Forest Lost During the Period 1981-90 for Representative Countries of the GHA & Southern African Regions:

GHA

Country	Forest and Woodland 1990 (ha)	Annual % Change (1981-90)
Sudan	68,955	(1.0)
Tanzania	68,497	(1.2)
Uganda	16,023	(0.9)
Ethiopia	41,991	(0.2)

Southern Africa

Country	Forest and Woodland 1990 (ha)	Annual % Change (1981-90)
D.R. Congo	166,076	(0.6)
Zambia	60,337	(1.0)
Angola	77,198	(0.7)
Madagascar	23,225	(0.8)
Mozambique	55,881	(0.7)

Singh et al (1999) findings relevant to ESA region forest resources included the following:

- *Nine percent of land under forest cover sustains approximately 10 percent of the human population.* Large and growing populations around forest resources place the forests at risk of degradation; and
- *Seven percent of land area is under protective status (i.e., national parks).* Similarly, only six percent of biodiverse natural forest areas are protected.

It should also be noted that tropical forests serve as an important carbon sink for worldwide CO_2 emission. Continued loss of forest biomass will further contribute to global climate change. The Congo basin forests, much of which is contained within the DRC, has been identified by USAID as a target area for tropical forest conservation under the Global Climate Change Initiative. Prior to that initiative, USAID's Africa Bureau committed in 1996 to the development of the Central African Regional Program for the Environment (CARPE) focused on the closed canopy tropical forest regions, and now beginning its second phase of five years.

2.1.3. Freshwater and Marine Resources

Freshwater and marine resources in Africa are important for reasons of economic growth and nutrition, and well as a range of ecosystem services, including biodiversity conservation. Shumway (1999) identifies key rivers, wetlands, lakes, mangroves and coral reefs, as well as internationally recognized (e.g. Ramsar site), and distinguishes priority areas for protection, including: Kenya's Kiunga Marine National Reserve and Mozambique's Parque Nacional de Bazaruto (for regional marine conservation); and two of the Great Lakes - Victoria and Tanganyika (for food security). On the Tanzanian coast, considerable seaweed cultivation is taking place.

The ecological and economic productivity of these resources are threatened by several factors. Examples of severe degradation, and loss of productivity of these resources, such as in the case of Uganda's Lake George, underscore the seriousness of the threat. According to Shumway, threats to these resources find their roots in poverty, deliberate overexploitation, and misguided planning, and include the following:

- *Policy and planning weaknesses* fail to integrate aquatic systems management across sectors, and local and international jurisdictional issues constrain effective management;
- *Exotic species introductions* may upset ecological balances, as in the case of Lake Victoria, where deliberate introduction of Nile Perch caused the largest mass extinction in recorded history, and the accidental introduction of water hyacinth continues to stress lake systems;
- *Overfishing* can upset the ecological balance of individual species or of entire ecosystems;
- *Deforestation* leads to a number of conditions that tend to degrade or upset aquatic ecosystem balance, including sedimentation; temperature change; reduction in nutrient levels; and reduction in levels of dissolved oxygen;
- *Pollution* from agricultural, municipal, and industrial sources may have acute or chronic effects on aquatic organisms;
- *Agricultural and aquacultural conversion,* as in the conversion of wetlands or mangroves to agricultural production, may disrupt or eliminate a range of ecosystem functions important for food security and biodiversity (e.g., fish breeding);
- *Water diversion,* as in construction of dams or irrigation schemes can degrade (or eliminate) habitat, fisheries resources, and disrupt traditional patterns of floodplains agriculture; and
- *Global climate change* may alter water flow regimes, and exacerbate desertification in floodplain areas.

As specifically concerns reefs, WRI's *Reefs at Risk* (1998), explains that East Africa's coral reefs are vital source of food, and among the world's most biologically diverse ecosystems, but are threatened by:

sewage discharge and overexploitation (e.g., coastal development, especially near large cities such as Mombasa or Dar es Salaam); destructive fishing practices; and agricultural runoff.

Shumway (1998) identifies 14 important aquatic resources that could benefit from integrated approaches to address their associated threats. Areas in the GHA region include Lake Victoria and the greater Nile Basin; Lake Tanganyika; Uganda's wetlands; Tanzania's Rufiji Delta/Mafia Island; and East African Coral Reefs.

2.1.4. Watershed Perspective

A watershed management perspective places one at a higher level of organization consistent with the natural functioning of the planet. Watersheds provide ecological services, habitat, economic capital (water, food, energy, transportation), and are separated by hydrological boundaries that limit interaction between watersheds. Hence, adjacent watersheds can exhibit widely varying degrees of degradation, depending on management regime. Revenga et al (1998) studied 145 major watersheds around the world, characterizing the status of each. Results for the major GHA watersheds are discussed here. In assessing the causes of watershed degradation, Revenga grouped threats into four major categories:

- *Physical modification* changes the dynamic of watersheds;
- *Habitat degradation* due to deforestation; agricultural conversion; and mining reduces watershed ability to support life and provide ecosystem services;
- *Water use* for agriculture and other sectors is increasing, and may exceed recharge rates;
- *Pollution* can disrupt ecosystem function in a number of ways by its effects on living matter;
- *Loss of freshwater diversity* resulting from degradation or mismanagement (e.g. overfishing) can disrupt the ecological function of the watershed.

Revenga (1998) identifies two subbasins as notable for fish diversity and endemism: Lake Victoria and Lake Tanganyika. Table 3: GHA Watershed Environmental Profiles (see Annex D) presents information on characteristics and status of five principal GHA region watersheds or subbasins. Of particular concern in the GHA region is the Nile Watershed Lake Victoria Subbasin, which exhibits the highest population density and a high rate of deforestation (but with significant remaining forest resources). Forty percent of the subbasin is currently under cropland (a higher percentage than any other GHA watershed). The area also contains significant biodiversity.

Singh et al (1999) identifies population pressure as a critical environmental threat to the Lake Victoria subbasin. He found that population density and growth in the area (defined by a 100 km buffer zone around the lake) was significantly higher than overall continental averages, a trend due to the abundant fisheries, forest, and fertile land resources. The lake itself is already under significant stress due to overfishing, agricultural and industrial pollution, and the current infestation of water hyacinth. Many predict that continued unregulated growth in the Lake Victoria subbasin may lead to ultimate ecological collapse.

2.1.5. Conflict and the Environment

Winterbottom and Neme (1997) discuss the environmental dimensions of conflict and review contributing environmental issues and threats. A review by the Environment and Conflicts Project (ENCOP) (Bächler 1994, cited by Winterbottom and Neme 1997) of the role of environmental transformation and desertification found that 80% (17 out of 21) of subsaharan African conflicts occurring over the past 30 years had either environmental dimensions or were at least partly environmentally induced. Thrupp (1997) highlights the transboundary nature of a critical GHA resource endowments as a source of "conflict and hostile competition." A large portion of the GHA region's

refugees are *environmentally displaced persons* – people displaced in some measure due to environmental degradation or destruction. According to Winterbottom and Neme, major environmental stresses that may lead to tension and conflict include:

- *Natural disasters.* Africa has been shown to be especially prone to natural disasters such as locust outbreaks, drought, flooding, and disease epidemic. The location of the GHA region makes it particularly susceptible to such disasters;
- *Desertification.* Africa's arid regions have more current and potential conflicts, and a greater percentage of conflict with environmental dimensions. Arid lands are generally fragile, less productive, and marginal for supporting human populations. Yet arid regions contain some of Africa's larger populations, which are also among Africa's poorest, with poverty associated with low productivity and high degree of land degradation. GHA countries within the arid *sudano-sahelian* belt are Sudan, Ethiopia, Kenya and Somalia;
- *Resource alienation.* Government policies can undermine traditional and sustainable systems of natural resource management. When traditional systems are disrupted, resultant systems often lead to environmental degradation. Examples from the GHA include disruption of pastoral migratory routes and changes in land tenure laws;
- *Conflict over water resources.* Demand for water by increasing populations and growing economies from sources that may become depleted or degraded can raise tensions between local, regional and international populations. Conflicts are more likely to occur when (a) river systems are shared by more than one country -- Singh et al (1999) found that 63 percent of Africa's land area lies within transboundary river basins; (b) when water resources become limited; and (c) where water use/allocation agreements do not exist. Of particular concern for the GHA region is the Nile River Basin. Countries where a large part of the water flow originates from outside their border (e.g., Egypt: 97%; Sudan: 77%) may be placed at odds with source countries (85% of the Nile's flow originates in Ethiopia). Accelerating development in source/upstream countries such as Ethiopia and Uganda, and concomitant increases in upstream water use will be a source of future tension;
- *Development programs.* Large scale development programs such as the building of dams can cause contentious large-scale displacement and resettlement. Structural adjustment programs may lead to encouragement of natural resource extraction (e.g. timber) due to currency devaluation, or shifts away from sustainable agricultural production systems due to subsidy removal; and
- *Public health issues.* Disruption of ecological systems by development projects can lead to degraded water supplies and increased disease transmission. Industrial disasters (pesticide spills, land degradation due to mining) may also cause environmental stresses.

Many of the above threats to the environment lead to increased tensions due to their actual or potential effects on food security. The following section discusses the environmental dimensions of food security.

2.1.6. Food Security and the Environment

The GHAI Strategy (1997) recognizes the limitations placed on food security by the natural environment. Factors such as low and variable rainfall, drought, and large areas of marginal land constrain the food production potential of the region. Significant land and water resources have been degraded to varying degrees as a result of a number of threats in the GHA region. Thrupp (1997) highlights several:

- *Land and soil degradation,* or the loss in biological or economic productivity, is a serious concern throughout Africa and of particular concern in the GHA. Land degradation has a number of dimensions and causal factors. Agricultural lands may suffer from soil erosion and soil nutrient depletion due to inappropriate practices. Overgrazing and poor management of pastoral lands may lead to soil erosion and desertification (loss of vegetative cover);

- *Biodiversity loss*, here referring to the "agrobiodiversity" on managed or productive lands can lead to lost productivity, as agricultural practices tend towards monoculture. This threat includes the loss of genetic diversity within domesticated plant and animals, which reduces future options for improved varieties and more productive or resilient agricultural and pastoral systems;
- *Deforestation*, together with the loss of other woody vegetation contributes to land and soil degradation, and erosion of biodiversity; and
- *Natural constraints*. A number of inherent biophysical constraints limit productivity potential of the GHA. Those constraints include poor soils, variable and limited rainfall, recurrent patterns of drought, flooding, and susceptibility to pest infestations (e.g. locusts).

Singh et al (1999) found that grasslands and savannas make up 36 percent of Africa's total land area, but support 60 percent of the population. These areas are therefore critical for food production. Singh et al identified prevailing environmental threats to such areas as "overgrazing, static grazing patterns, encroaching land conversion, and increasing population densities."

Thrupp (1997) identifies three "critical resource areas" where the nexus of food and environmental security is particularly apparent due to large, food insecure populations, serious environmental degradation, or both: (1) resettlement areas and refugee camps that concentrate large numbers of people in areas with inadequate ecological carrying capacities; (2) the Lake Victoria watershed, which exhibits large and growing populations together with degradation of both land and water resources; and (3) transboundary grazing commons with high degrees of degradation, insecure tenure systems, and competition for water resources.

REDSO's Food Security SO 5 analytical and programmatic agenda is addressing regional livestock and rangeland resource management issues, including wildlife-livestock interactions, veterinary services to pastoralists, and market linkages, especially in the southern Sudan, southern Ethiopia, Somalia and northern Kenya cross-border zones.

2.1.7. Health and the Environment

Environmental factors are one of the major causes of disease in sub-Saharan Africa. Many environmental health problems are associated with poverty, such as lack of access to clean water, food, shelter, fuel, and air (EHP, 1999;WRI 1998). These environmental factors are a major underlying cause of many infectious diseases. Deficiencies in environmental sanitation – solid waste, wastewater, excreta disposal, drainage, and community hygiene – contribute to the continuing high rate of infant and child mortality from diarrheal diseases and also play a role in vector-borne diseases. Many studies indicate that lack of sanitation puts people at higher risk for diarrheal disease than lack of safe water. Nonetheless, sanitation has generally been neglected in favor of water supply by governments, external sport agencies, and even unserved communities. Other environmental health hazards are associated with development: increased use of chemicals; and burning of fuels. The World Resources 1998-99 Report (WRI 1998) cites several critical environmental health issues relevant to subsaharan Africa:

- *Lack of adequate water and sanitation* accounts for an estimated 7% of worldwide death and disease;
- *Mosquito-borne diseases* are a major killer. Between 1 and 3 million die each year from malaria; millions more are affected by yellow and dengue fever;
- *Indoor air pollution*, from burning dirty fuels, help cause acute respiratory infections. World Bank estimates place the number of women and children exposed to severe indoor air pollution - mostly from cooking fires) as between 400 and 700 million;
- *Increasing use of toxic chemicals* in agricultural, manufacturing, and processing operations by both small- and large- scale operators place workers and locals at risk of exposure;

- *Global climate change* threatens of alter short- and long-term health patterns due to changing climates;

USAID's Environmental Health Project (EHP 1999), which addresses the role of environmental and behavioral risk factors in the world's health burden, has developed an environmental health framework for prevention and new approaches for the field, with emphasis upon reducing the burden of disease for children. Eight results areas have been highlighted: diarrhea prevention, malaria prevention, sanitation policies, behavior change, community involvement, services for urban poor, risk assessment and institutional strengthening.

Any health program should be cognizant of and responsive to the environmental components of health risks and trends, e.g.:

- There has been an increase in prevalence of malaria in traditionally malaria-prone areas such is in Western Kenya, but also a new trend towards increases in malaria in highland areas, especially after heavy rains, where it has rarely or never been seen before. The latter trend is particularly troubling because limited natural resistance exists in that area. The causes for this increase are not well understood, but likely are partly due to increased trends of agricultural conversion from woodland and forest.

- With a continuing upward trend in the prevalence of HIV/AIDS in Kenya, comes the need to develop programs of HIV/AIDS and STI prevention and treatment services at the community level throughout the country. This brings with it healthcare waste management issues and related if relatively modest risk of disease transmission and environmental contamination.

- The under-five mortality rate for children in some ESA countries, such as Kenya, has recently swung upwards, according to the 1998 Demographic Health Survey for Kenya (pers. comm. Michael Strong, USAID/Kenya Population and Health Office) This is probably related to a number of factors, and again it is not clear what links there are to environmental degradation or related environmental health parameters (e.g., deficiencies in water, sanitation, drainage, leading to diarrheal disease, malaria transmission, etc.).

2.1.8. Urbanization, Economic Development, and Environment

In the last thirty years, the population of SSA has increased 2 ½ times. However, the population of urban areas of SSA has increased 5 times (Erbach and Gaudet, 1998). In comparison to other regions of the world, Africa is less urbanized but is catching up quickly. Overall population growth in SSA is expected to continue to grow but at a lower rate. By 2025, the estimated population of SSA will be between 1.2 and 1.4 billion, depending on investments in education and health, which the urban areas experiencing relatively higher growth rates than rural areas. The growth in urban areas has been such a recent phenomena in SSA that the village or rural community is still the reference point for many city dwellers. In many countries, one-half of urban dwellers are either formerly residents or rural communities or the children of rural dwellers (Anderson and Erbach 2000).

The process of urbanization involves both the flow of people and the transformation and ultimately reclassification of rural land as urban. Urbanization is the sum of three processes (Anderson and Erbach 2000):

(1) Transformation of land at the urban fringe;
(2) Growth of rural areas above a threshold that leads to reclassification as urban; and
(3) Migration of people from rural areas to urban areas.

All three of these processes lead to the reclassification of formerly rural populations as urban, while the first and second processes also result in the area of land devoted to urban uses. A number of observations can be drawn regarding urban population trends:

- Between 2000 and 2020, all but three countries (Botswana, South Africa, and Zambia) will experience 100% increases in urban population while Ethiopia's urban population will triple during this period.
- While only two countries were projected to be at least 50% urban in 2000 (Botswana and South Africa), the number of countries with at least 50% urban population is expected to increase to ten in 2020.
- For the period 1980-1985, the median growth rate in urban population (5.4%) was more than twice the growth rate in rural areas (2.2%).
- Urban population growth rates are expected to slow down to a median rate of 4.6% in the period 2000-2005 compared to the median rate of 5.4% in the period 1980-1985, with a further decline in median growth rate for the period 2020-2025 of 3.4%.
- Rural population growth is projected to exhibit a similar declining trend, with median rural population growth falling to 1.8% for the period 2000-2005 and then to 1.0% for the period 2020-2025.
- Four of the five SSA cities expected to increase by more than 2.5 times in population between 1995 and 2015 are in ESA (Addis Ababa, Antananarivo, Maputo, and Kampala).

Cities throughout history have served an important function as marketing and distribution points, centers of service and industry, and gateways for trade. They play a role in connecting rural areas to infrastructure, even if the motivation is self-serving. Macro-level benefits from urbanization include "economies of scale," "localization economies," and "agglomeration economies" for industries, communications, and modern infrastructure (including water and electricity supply) and for social services (including health care and education) that can significantly improve the lives of millions of urban inhabitants (Erbach and Gaudet, 1998).

While urbanization has engendered significant benefits for both migrants and existing populations, there have been a number of negative impacts as well. These negative impacts are affect urban residents as well as rural residents, although in the latter case, the negative impacts are mainly associated with urbanization's impacts on the environment and the natural resource base in rural areas. For urban residents, the negative impacts largely are related to the inability of the urban area and its officials to respond adequately to the rapid increase in population. These failures relate to poorly designed policies, lack of institutional capacity, and limited financial resources to respond to demands for services and amenities.

According to the U.N. Center for Human Settlements (HABITAT) (WRI 1998), the severity of health problems associated with environmental degradation often worsens with poorly regulated economic development. Growing cities and urban areas are often the hardest hit. Agricultural intensification; industrialization; and associated increased use of energy (results sought by regional development agenda), each hold potential for environmental degradation and negative effects on human health.

Within the urban areas, there are substantial environmental impacts of urban activities. Among the environmental problems in the city are the following (Anderson and Erbach 2000):

- *Air pollution from industrial, commercial, and residential sources* – the use of low grade fuels, wood burned for heating and cooking. Environmental control equipment, particularly for small

facilities, is non-existent. Often there is a lack of planning that results in pollution sources in close proximity to residents.

- *Air and noise pollution from motor vehicles and construction sites* – pollutants include lead in leaded gas, sulfur dioxide and particulates from diesel fuels, hydrocarbons, nitrogen oxides, and carbon monoxide.

- *Lack of solid waste disposal services leads to health problems, litter, clogged drainage canals, and open burning.* Inadequate separation and disposal of different types of solid wastes exposes residents and particularly scavengers to toxic chemicals and results in leaching of pollutants to surface and groundwater. Lack of recycling, reuse options results in waste accumulation in unmanaged dumps.

- *Lack of sanitary facilities and poorly treated sewage* - contaminates rivers, lakes, coastal areas, and groundwater.

- *Microclimate effects* – the conversion of land with vegetative cover to urban uses such as buildings and pavement results in increased temperatures in the urban area that are a few degrees higher than surrounding areas, may increase electricity consumption rates.

Urbanization also has an impact on rural environmental and natural resources. The most immediate and noticeable impact is at the urban fringe, where agricultural, grazing, and wooded areas are converted to built up uses. Urban fringe land conversion illustrates the tyranny of small decisions. Viewed incrementally, the conversion of a few hectares of land at the urban fringe can be viewed as beneficial since the urban uses place a higher economic value on the land than was realized in its previous use. However, if the land conversion process is viewed in terms of the accumulated loss of productive land, it can undermine food security and encourage development of poorer quality lands to meet food needs. These marginal lands typically require greater quantities of water and fertilizer to achieve comparable yields of those lands at the urban fringe.

Urban residents have significant demands on the resources of rural areas, including food from agriculture and fisheries and wood for building and fuel. As the demand for these resources in urban areas increases because of population growth and the lack of affordable substitutes (e.g., electricity and natural gas for fuel wood), rural resource managers, farmers and fishers may be encourage to accelerate production above levels that can be sustained in either biological or economic terms.

Urban areas also have a significant impact on the quantity and quality of water resources. In areas where water is in scarce supply, farmers and rural residents cannot compete with urban customers. While alternative water supplies may be obtained through irrigation projects and pumping of groundwater, these sources are more costly to develop. The major impact of urban water users, however, is on water quality. Where urban wastewater is discharged untreated or inadequately treated into rivers, lakes, and bays, it can have an adverse impact on fisheries, wildlife, tourism areas, and other downstream water users. Some of the water impacts may involve downstream cities and industries that must incur costs to treat water to minimum standards associated with the intended use.

To summarize and illustrate the scope of negative impacts of urbanization, the below table provides results from the case studies conducted under the Environmental Planning and Management (EPM) process developed jointly by UNCHS and UNEP. The basic concepts and approaches for this process have been evolving and maturing over the last several years, largely through the participation of cities in the Sustainable Cities Program.

Summary of Urban Case Studies in ESA Region (adapted from Anderson & Erbach 2000)

City	Basic Characteristics	Key Issues	
Cape Town Metro Area	3.1 million people, on 50 km long peninsula	• Environmental hazards • Stress on special ecosystems	• Environmental health risks
Dar es Salam	3 million people, 5% annual growth, area of 1350 sq. km	• Environmental hazards in low income neighborhoods	• Improper waste disposal • Natural hazards
Durban	2.4 million people, 2.3% annual growth, area of 1365 sq. km, 9% of GDP, 55% of provincial economic output	• Unequal access to environmental services • Natural risks – landslides and floods	• Degradation of ecosystems • Industrial risks – chemical • Inefficient transportation
Johannesburg	4 million people, among fastest growing cities, area of 1100 sq. km, market/information function	• Poor water and air quality • Lack of open space and flooding	• Improper solid waste disposal • Poor residential hygiene
Kenya Small Towns	Towns between 5,000 and 80,000 population, areas 5 – 80 sq. km	• Natural resource degradation • Loss of amenities/quality of life	• Environmental risks related to rapid growth
Nairobi	2.5 million people, aarea of 685 sq. km, political and administrative capital	• Vulnerability of low income areas • Environmental health risks	• Inadequate infrastructure • Exposure to natural risks • Threats to natural heritage

Source: UNCHS/UNEP, *Sustainable Cities Program Workshop on Environmental Problems in Africa*, Dakar, Senegal, June 26-30, 1995, cited by Anderson and Erbach 2000.

2.1.9. Institutional Context

A number of institutional challenges confront the environmental management situation in the ESA region and throughout Africa. These challenges cut across the preceding themes. Critical issues and challenges include:

- *Lack of integration of environmental concerns into development.* "Environmental sustainability" is relatively new concept on the agenda of most African governments. While the recent flurry of NEAPs, creation of environmental management institutions, and the development of environmental policy and legislative frameworks have raised consciousness, actions "on the ground" have been limited by a lack of knowledge on how to apply relevant integrative tools;
- *Lack of integration of development concerns into the environmental agenda.* Swartzendruber et al (1998) writes that "The environmental agenda remains dominated by a false dichotomy between "development" and "environmental protection." Both sides need to understand the linkages between the two, and the possibilities for "win-win" situations;
- *Limited institutional capacity.* This catch-all phrase for institutional shortcomings is particularly relevant to environmental management institutions, which are generally young and at present, lower priority institutions in most ESA countries. Underfunded, understaffed, under-trained, and unempowered institutions may be no match for the task at hand;
- *Lack of regional cooperation.* This issue represents a large an obstacle to sound management of transboundary ecological units such as lake basins and rangelands;
- *Lack of local engagement.* Raising environmental awareness and capacity among central authorities alone is insufficient to stem the tide of environmental degradation. Involving local population stakeholders – those closest to and most directly affected by natural resources – is critical the successful design and implementation of activities at the local level;
- *Lack of private sector engagement.* The growing role of the private sector in African economies represents both a threat and an opportunity - the private sector can lead the crusade towards environmental sustainability; or it can spearhead the charge towards environmental exploitation. The private sector must be appropriately engaged; and

- *Globalization.* Swartzendruber et al (1998) observe that world economic trends will increasingly affect the African situation. As movement of people and goods increases in response to economic opportunity, new types of environmental issues will emerge.

As can be seen from the preceding sections, a host of threats originating from various domains places at risk regional ecosystems and the countries they contain.

2.2. USAID Bilateral Environmental Programs

This section briefly reviews the response of ESA (separated into GHA and southern Africa) USAID missions to regional environmental threats. Information presented is at a very general level. However, it is noted that the level of environmental programming, both in terms of the targeting and number of SOs, is significant and seems, at least for the purposes of this review, generally appropriate. Of particular note is the large focus on biodiversity conservation in countries identified as priority biodiversity (and also tropical forest) areas, and various environment and natural resource management (E/NRM) SOs in countries with significant forest resources or critical environmental issues: specific biodiversity/ENRM SOs have been developed in Uganda, Kenya, Tanzania, Madagascar, Malawi, and Namibia. A regional NRM SO has been formulated by USAID's Regional Center for Southern Africa (RCSA). SOs including significant components (IRs, RPs) in ENRM are found in Mozambique, Zambia, Zimbabwe and South Africa. All REDSO SOs have been subjected to initial environmental examination and have had environmental considerations built into them. Several Missions pursue sustainable agriculture and NRM objectives via Title II Food Aid for Development programs implemented by PVOs, usually as part of a rural development SO: Ethiopia, Kenya, Madagascar, Mozambique, Rwanda, and Uganda.

For more specific information, readers are referred to R4 reporting documentation and CSPs available from the USAID and FRAME web sites (see References). Additional information on mission programs in presented in Table 5: Environmental Profiles of Selected REDSO/ESA Client Countries (see Annex D).

2.2.1. GHA

Three GHA USAID missions have significant E/NRM SOs. Uganda, Tanzania and Kenya each have major programs focusing on biodiversity conservation. A large part of Uganda's E/NRM SO focuses on tropical forest conservation. The Africa Bureau supports a pilot activity aimed at protecting the Eastern Arc Mountains of Kenya and Tanzania. These three countries (together with Ethiopia), were identified by USAID and other conservation stakeholders as priority biodiversity countries. In the case of Uganda, within the context of its SO 2 Conservation of Biodiverse Systems (COBS) program, the Mission manages a regional water hyacinth control program funded under the GHAI, with the East African Cooperation as principal regional partner, and to which REDSO has added resources for environmental information systems. Ethiopia, Eritrea, Kenya, Tanzania, and Uganda also program environmental funds into agriculture or rural enterprise SOs with environmental components.

2.2.2. Southern Africa

Six southern Africa missions have significant environment and natural resource management (E/NRM) SOs. Madagascar and Zimbabwe each have had programs focusing on biodiversity conservation and CBNRM; Botswana's NRMP ended in September 1999, but elements of it are being carried forward in RCSA's SO 3, Increased Regional Cooperation in the Management of Shared Natural Resources. These three countries (or regions which they are a part of) were identified as priority areas for biodiversity conservation. Madagascar also has significant forest assets at risk, which are also targeted by their E/NRM SO. Botswana, Malawi (proposed SO), Mozambique, and Namibia each have more general "sustainable NRM" SOs. The DRC benefits from the regional CARPE program aimed in

part at conservation and sustainable management of the DRC's significant forest resource. South Africa has an urban (housing) SO, with an IR specifically oriented towards environmental results, such as energy and water conservation. Several missions also program environment funds into SOs in other sectors: Economic Growth, Agriculture, Private Sector (Mozambique) and Rural Enterprise (Angola, Botswana, Malawi, Mozambique, Zambia); Democracy and Governance (South Africa, Zambia); and Health (Zambia).

USAID, through the Southern African Regional Program (SARP), has supported several natural resources management programs in the SADC region since the early 1980s. USAID's in Botswana, Malawi (NATURE), Namibia (LIFE), Zambia (ADMADE) and Zimbabwe (CAMPFIRE) pursued bilateral programs focusing on a variety of approaches toward Community-based Natural Resources Management (CBNRM). These were regionally coordinated by the SARP Natural Resources Management Program (NRMP). RCSA provided support to specific activities such as the Regional Networking and Capacity Building Initiative for Southern Africa (NETCAB), implemented through IUCN since 1995. A complementary initiative, supported by RCSA, is the Natural Resources Accounting project aimed at establishing the economic value of the region's natural resources in order to incorporate these into national accounts. Under the NRM portfolio the following results have been achieved:

- Widespread adoption of CBNRM as a tool for NRM. Successful community-based approaches developed in the wildlife sector have been adopted in other sectors such as forestry and fisheries;
- Community based institutions have been set up to manage local resources as governments in the region have moved towards further devolution of control over resources to local communities, especially in Namibia and Botswana;
- Increased awareness among national policy makers to cooperate in managing resources that transcend national boundaries;
- Increased capacity of the region's NRM practitioners through a variety of training programs. Including a course in the management of shared water resources for senior water managers from the region.
- Regional protocols in the water and wildlife sectors have been signed through SADC, laying the groundwork for increased cooperation among states in the management of natural resources.
- In the water sector, guidelines for harmonizing the water protocol with the UN Convention of Non-navigable Use of International Water Courses have been produced and support is being given to the water sector to develop draft national water laws that take the provisions of the protocol into account;
- Functional issue-based networks are now sharing information through e-mail connectivity such as the network whereby the region's herbaria share biological diversity conservation techniques.

Despite these achievements, the southern African region still faces a number of constraints to sustainable NRM. These include:

- Weak and uncoordinated NRM policies;
- Lack of integrated planning
- A general lack of trained personnel for policy formulation, implementation, and program monitoring;
- A dearth of capable institutions in the region to implement programs in the NRM sector.
- Poor or weak environmental monitoring systems, which are vital for collecting and analyzing information to formulate or modify policy.

3. REDSO Strategic Response

This Section consists of an environmental review of proposed REDSO/ESA strategy components. The review will comment on the potential effectiveness and sustainability of strategy components and activities (both ongoing and planned) from an environmental perspective; and identify opportunities for sustainable impact by better integrating environmental considerations into REDSO's activities, both within and across program components.

3.1. Key Determinants in Priority Setting

The U.S. national interests in the GHA region center around humanitarian, political and development issues.[10] In response to these interests, the GHAI, a presidential initiative headed by the USAID Administrator, was developed.[11] It is in the context of these national interests, as expressed in the GHAI, that REDSO, the USAID operating unit with an existing GHA regional mandate and operational capacity, was assigned responsibility for overall coordination of GHAI implementation in the field. As such, REDSO's development focus - that of advancing the overall goal of the GHAI - has been determined. However, while REDSO's general direction has been determined, it is critical to bear in mind that there are sixteen bilateral USAID missions in the ESA region (including the six sustainable development Missions within the GHA, but not the NPC), each with its own significant development portfolio. Each bilateral mission strategy has been developed in accordance with the "environmental framework" discussed in Section 1. As indicated in the previous section, the collective regional response to these statutory requirements in terms of environmental programming (including programs related to tropical forest and biodiversity conservation) appears appropriate. As such, while REDSO can serve a useful role in ensuring a continued appropriate ESA regional response to these environmental issues, given REDSO's designated GHAI coordination role, development of an "environmental" SO is not planned. However, this analysis considers *all* REDSO SOs and the environmental implications of their activities.

USAID's *Guidelines for Strategic Plans* makes it clear that if a mission cannot pursue an environmental SO as part of its portfolio, it should attempt to address environmental issues under other sector SOs. With a strategy designed to address regional food insecurity and recurrent conflict, given the environmental roots of these problems, **REDSO, in order to succeed, must ensure that environmental considerations are fully integrated into its strategy.** Integration means more than having an "Environment/Natural Resource Management" Team with its own activities. Integration means that each REDSO SO, office, and team must work with the E/NRM Team to be cognizant of the environmental issues, potential impacts, and integrative strategies relevant to their sector when considering the design, implementation and monitoring of activities.

3.2. GHAI Strategic Priorities

The GHAI seeks to stimulate a collective effort to "break the cycle of despair" in the GHA, arguing that past efforts have tended to address the symptoms of crisis rather than the causes, and that food security is a key ingredient in creating a "wedge" that breaks the cycle of despair in the region. The GHAI also notes that conflict prevention is linked to food security and is also a key element to achieving regional progress. The GHAI embodies a set of principles designed to operationalize the program: (1) African ownership; (2) strategic coordination; (3) linking relief and development; (4) regional

[10] Strategic goals for State/AFR/EA include regional security, humanitarian assistance, democracy/human rights, and counter terrorism (Draft REDSO/ESA Strategy, 2000).

[11] The U.S. Government Inter-Agency Strategic Plan states that the U.S.G. will aim to reduce regional conflict by attempting to *"address the root causing of conflict both multilaterally and bilaterally, using development assistance and support to democracy."*

perspective; and (6) promoting stability. The highest level goal of the GHAI is *"A Food Secure, Just and Peaceful Region,"* which is supported by SOs relating to food security; conflict prevention, mitigation, and response; and access to analytical information. The GHAI is currently guided by the GHAI Strategic Plan, which covers the period 1998-2002.[12]

3.3. Environmental Review of Proposed REDSO Strategic Plan

REDSO is responsible for coordinating overall implementation of the GHAI in the field. As such, most of REDSO's efforts will involve implementation of GHAI regional activities, and working with GHA bilateral missions to elicit "convergence."[13] This section reviews each of the five major REDSO strategy components: (1) SO#5: *Enhanced African Capacity to Achieve Regional Food Security* (2) SO#6: *Enhanced Capacity for Managing Conflict in the Region;* (3) SO#7: *Enhanced Regional Capacity to Improve Health Systems;* (4) SO #8: *Effective Services to ESA Missions and Support to Regional Partners*; (5) SO#9: *Effective Delivery of USG Assistance to Non-Presence Countries.* The latter covers activities in Sudan, Somalia, and Burundi.

3.3.1. SO#5: Enhanced African Capacity to Achieve Regional Food Security.

For the purposes of this section, SO#5 Team activities are separated into "sectoral" themes of: agricultural productivity; economic growth (including private sector development/trade); and environment and natural resources. For each "sector," activities are reviewed and discussed, after which follows a section on "opportunities" for the overall SO#5 Team that explores the various linkages among SO#5 activities as well as with other REDSO SOs.

3.3.1.1. Agricultural Productivity

A sizeable portfolio of agricultural productivity-related activities are coordinated under ASARECA[14]. Activities embrace development and transfer of agricultural production and post-harvest technologies, and involve activities such as: identification of research areas; research planning and proposal development; agronomic research; and both on- and off-farm storage and processing techniques. Current grants are to: (1) CIP for potato and sweet potato research and extension; (2) IITA for cassava research and extension; 3) CIAT for bean research and extension; (4) CIP for the technology transfer activities; and (5) IITA for market research and postharvest handling. Another current activity, through a "buy-in" with INTSORMIL, supports IGAD in the design of drought-tolerant crop projects. These large, multi-year activities are expected to constitute the bulk of REDSO's agricultural productivity activities during the strategy period.

Environmental impacts. Most of the activities supported involves analyses; studies; information collection/dissemination; workshops; and similar activities with no direct effects on the environment. However, potential modest environmental impacts may be associated with agronomic research activities to be carried out by the various partners. Currently, an Initial Environmental Examination (IEE) is in place for this set of activities that calls for application of an environmental review process for individual activities as they are designed and implemented (Negative Determination with Conditions). This entails some strengthening of the grantee partners (as well as ASARECA) on USAID's environmental review procedures.

[12] The Greater Horn of Africa Initiative (GHAI) Strategic Plan: FY 1998 - FY 2002, November 1997 (USAID).
[13] "Convergence" refers to the movement of bilateral mission strategies and programs towards the GHAI in terms of objectives and approach.
[14] ASARECA (Association for the Strengthening of Agricultural Research in East and Central Africa) is a regional intergovernmental organization composed of National Agricultural Research Institutes from ten countries in East and Central Africa: Kenya, Uganda, Tanzania, Rwanda, Burundi, DRC, Sudan, Ethiopia, Eritrea, and Madagascar.

The potential for expansion of agrochemical inputs and genetically modified organisms associated with successful intensification of agriculture constitutes an area needing continued surveillance and proactive programming.

Opportunities. ASARECA in February 2000 convened a workshop to develop elements of a strategy for natural resources management research in Eastern and Central Africa. The meeting recommended that the strategy and content of NRM research among the various network members be termed "Management of Soil, Water, Vegetation and Livestock Resources for Growth and Sustainability of Agricultural Products." Particularly promising in terms of promoting integrated programming within SO #5 are the African Highlands Initiative (AHI), the Agroforestry Research Networks for Africa-Eastern and Central Africa (AFRENA-ECA), the new Soil and Water Conservation Network (SWNet), and the Eastern Africa Plant Genetic Resources Network (EAPGREN). Likewise, the Animal Agriculture Research Network is a dual purpose network which can also contribute to the development of technologies for sustainable NRM in the region.

3.3.1.2. Economic Growth/Trade

The private sector can plan a vital role as an engine to increase trade and spur economic growth can play a vital role towards achieving food security for the region. Activities related to economic growth and trade are aimed at promoting economic reforms that will lead to increased levels of trade and investment. Strategies include creation and support to partnerships between African-owned ESA regional organizations, particularly those that will create and foster opportunities for partnerships between the public and private sector.

Current activities include: (1) Support to ASARECA for network monitoring, policy analysis and implementation, and institutional funding; (2) the Regional Trade Analytical Agenda (RTAA), which addresses specific issues related to regional trade (including cross-border trade), communications and transportation barriers and on analyzing country comparative advantage in the production of specific commodities (key RTAA partners include: COMESA [Common Market for Eastern and Southern Africa]; EAC [East African Cooperation]; and IGAD); and (3) support to the regional policy and regulatory environment for trade, marketing, networking and investment (key partners: COMESA; IGAD; and ESABO [Eastern and Southern Africa Business Organization].

Environmental impacts. Most of these activities involve analyses; studies; information collection/dissemination; workshops; and similar activities with no direct effects on the environment. Currently, an IEE is in place for the current ASARECA and RTAA activities (the same umbrella IEE that includes the "commodity networks").

USAID usually considers indirect support to input and output marketing as potentially influencing pesticide use, therefore the actual linkages need to be thought through, per 22 CFR 216.3(b). Several of the components of the Agricultural production agenda will reasonably lead to new practices or changes in practices related to seeds, pesticides, etc., in addition to water and energy use, land clearing, etc. These components include business linkages, targeting of new market niches, technology transfers, restructuring of publicly owned operations, and capacity building/management training. It does not seem unreasonable for USAID to proactively put specific requirements in the technical assistance and linkage grants that contractors should foremost encourage sound environmental practices.

Also, there are also clear, non-tangential business reasons to encourage safe/minimal use of pesticides, for example. One relates to the contribution of HIV/AIDS to productivity issues in the labor pool. It has been well demonstrated that poor pesticide handling and use practices result in widespread illness among farm workers in developing countries. It seems particularly prudent, therefore, to carefully manage

chemical use (and probably fertilizer use) to adequately protect the health of immune-deficient HIV/AIDS victims and labor productivity.

When at all possible, it is desirable to encourage "upstream" thinking about these sorts of issues, such as in Requests for Proposals, including a criterion encouraging partners to think through the environmental "win-win" opportunities in agribusiness programs, and asking them to respond in their proposals with how they would incorporate environmental sustainability and soundness into the program.

3.3.1.3. Environment and Natural Resource Management

The E/NRM Team has several activities planned and/or underway, focused on strengthening capacity of selected regional institutions to promote environmentally sustainable management of resources. The selection of natural resource areas and issues was based on their relevance and contribution to food security, conflict, and potential for synergy with other components of SO#5, other REDSO activities, and bilateral mission activities. The following gives a brief overview of those activities.

Activities will include a strong focus on strengthening regional capacity (through selected partner institutions and their national counterparts) for sustainable management of key transboundary resources, including:

- *Pastoral Rangelands.* Support to OAU/IBAR (Intergovernmental Bureau for Animal Resources) will aim at strengthening their capacity to address factors limiting productivity and sustainability of traditional pastoral systems;
- *Coastal Resources.* Partnership with the Western Indian Ocean Marine Sciences Association (WIOMSA) will strengthen that institution towards fulfilling its potential as a regional center of excellence in coastal resource management. USAID/Kenya and Tanzania have country-level programs in coastal resource management;
- *Freshwater Resources.* Support to ACTS will focus on enhancing their capacity to identify and address issues affecting watershed management (It should be noted that IGAD is receiving HASP support on regional water management issues; and the EAC is benefiting from GHAI support to on water hyacinth control in the Lake Victoria subbasin. Also, USAID is providing support to an Environmental Threats, Opportunities, and Constraints Analysis (ETOCA) study under the Nile Basin Initiative).

Another set of activities will seek to enhance capacity to develop and implement environmental review procedures on a coordinated regional basis. Regional "harmonization" of environmental procedures and laws is critical to coordinated and sustainable management of transboundary resources. For example, control of the invasive species water hyacinth in Lake Victoria has been severely hampered by lack of a regionally acceptable environmental impact assessment. Targeted partner institutions include regional organizations with natural resource management functions: the EAC; ASARECA (relevant to a broad range of agriculture and NRM activities); and ACTS. IGAD, given its broad regional development planning mandate, would be another strategic partner.

Finally, as mentioned earlier, support to the DMC is managed by the E/NRM Team. This activity supports efforts of the DMC to maintain and strengthen its ability to predict and respond to climatic variability, with emphasis on pastoral rangeland ecosystems. It has clear linkages to the agendas of SO #6 and SO #9.

Overall, the E/NRM activities appear well targeted in terms of both selecting activities relevant to the overall strategy and capitalizing on linkages with other activities.

Environmental impacts. By design, the E/NRM activities should have beneficial effects on the environment by building regional awareness and capacity on environmentally sustainable management of a range of natural resources.[15] There is in any case a need to encourage mainstreaming of environmental consciousness and sustainability in all activities promoted and advised by the SO #5 E/NRM team.

3.3.1.4. Opportunities for SO#5

Environmental security[16] is a prerequisite for long-term food security. Because the natural resource base serves as the ultimate basis for food production, development approaches that combine sound natural resource management practices with environmental rehabilitation have the greatest potential to maximize food productivity. Given the opportunities (and need) for synergies within SO#5's own activities, as well as between SO#5 and other proposed SOs, as REDSO moves into its new strategy period, the SO#5 Team should explore management structures that better promote dialog and coordination between its various component teams/groups. This section presents several linking themes and possible opportunities within each. Opportunities for linking SO#5 (focusing on environmental issues) and SOs #6 and #7 are discussed in the sections dealing specifically with those SOs.

Conceptualizing and Rationalizing Activities. There needs to be more emphasis placed on ensuring that activities (either actual or planned) are conceptually linked to the unfolding strategy. Many ongoing activities are simply taken for granted as being rational parts of the new portfolio with no discussion on how they fit in or on what may be missing. The E/NRM Team conducted its own internal strategic planning exercise by thinking through the conceptual framework of why "environment" was important to food security and conflict resolution; thinking through the rationale for choices of activities and partners; and identifying the linkages between E/NRM activities and other SO#5 activities, and well as with other REDSO SOs and bilateral mission activities. This exercise was useful for the E/NRM Team and might be replicated by the other groups within the SO#5 Team and then by the overall SO#5 Team as an exercise to facilitate integration of environmental considerations into SO#5 activities, as well as integration of SO#5 activities in general.

As an illustration, has anyone weighed the relative contribution to food security (and conflict) of GHA's productive marine, aquatic and cropland, rangeland resources, and the needs of these various sector? The current and historical focus of REDSO has been on agricultural crops and regional trade, and much less on aquatic and range resources. However, SO#6, has clearly focused on water and pastoral lands as two key sources of conflict. Only the E/NRM Team within SO#5, is placing some emphasis on coastal, aquatic and rangeland resources in terms of planning. Or should the E/NRM team abandon its plans for support to these areas and concentrate efforts on agricultural systems and partners such as ASARECA as the most logical principal focus?

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[15] The [former] Regional Environmental Advisors's Closeout Report does mention that the "Environment" Sector needs to address its Reg. 216 compliance needs (Bingham 1999).

[16] Thrupp (1997) cites several sources in defining environmental security: *"Environmental security has been generally defined as 'a state in which an ecosystem is able to support the healthy pursuit of livelihoods by the people living in that system.' It refers to the sane and sustainable use of natural resources, safe disposal of wastes, as well as protection from pollution and abuse (from warfare and other exploitative activities), and conservation of biological diversity. Like food security, environmental security is important at global, regional, national, and local levels. Regional environmental security is an important concept in the GHA context; it is important as a goal to ensure regional institutional cooperation to sustainably use, share, and conserve resources."*

Agricultural Production and the Environment. Veit (1998) discusses various strategic implications for better linking agriculture and the environment:

- Increases in agricultural production should be driven by changes in practices that lead to sustainable intensification that concentrate on improving or maintaining soil fertility; protecting soils from erosion; and maintaining on-farm biodiversity;
- Sustainable intensification must be supported by agricultural services and policies that make available the necessary inputs and technologies;
- Changes in resource tenure regimes that promote greater long-term investments in land will also support sustainable intensification;
- Investment in rehabilitation of degraded marginal lands, combined with appropriate stewardship, can bring such lands back into production; and
- "Biodiverse wildlands" that may provide critical ecological services to local production systems can be managed to provide sustainable benefits in more tangible ways (e.g., minor forest products, watershed protection) and thereby create additional incentives to conserve these areas.

Food Security and Biodiversity Conservation. Wilkie (1999) explores the linkages between food security, agriculture and biodiversity, making several points on both synergistic and "perverse" impacts and linkages:

- Increasing food security by extensification or specializing in few crops (i.e., high-value non-traditional agricultural exports) will adversely affect biodiversity;
- Activities that reduce soil erosion will minimize the need to cultivate new lands, and is therefore good for biodiversity conservation;
- Protected areas are good for agriculture and food security where ecosystem services such as water flow regulation and habitat for pollinators are provided, but may have negative consequences due to their providing habitat for crop-raiding species; and
- Protected areas can potentially provide sustainable harvests of various products that serve as an "insurance policy" against crop failure.

Targeting. A number of areas, due to their biological productivity, are important areas for both food security and biological diversity. By targeting such areas, activities can contribute to both goals. For example, several areas mentioned earlier in the context of valuable biodiversity sites are also critical areas for food security. Those include the shared ecosystems of the Lake Victoria subbasin, and the east African coastal zones.

On-Farm Biodiversity (or Agrobiodiversity). On-farm biodiversity is an important component of productive and synergistic farming systems. Support to agricultural research and extension should ensure that programs seek to maintain or enhance biodiversity in agricultural, fisheries and pastoral production systems. Strategies to enhance biodiversity may include incorporation of genetic diversity in plant breeding; increasing diversity in production system components; use of integrated pest management (IPM). IPM has eminent potential to be a cross-sectoral strategic tool for regionally enhancing linkages between environmental protection and food security.

Trade Standards. International trade standards offer growing opportunities to leverage environmental gains as part of rapidly expanding global trade. Stoughton and White (1999)[17] discuss the possible effects of several different categories of trade standards:

[17] Stoughton, Mark and Allen White. *Trade and Environment: Critical concepts and considerations for project design and implementation.* 1998. For USAID/AFR/SD. EPIQ/Tellus Institute, Boston, MA.

- *Product standards* as can be imposed in trade agreements can set standards of imports to protect public health and the environment, as in the setting of limits of pesticide residues in agricultural produce;
- *Eco-labeling* can be used to appeal to environmentally aware customers by providing information on the environmental nature or of the environmental impacts of a product and achieve higher returns; and
- *Environmental Management System Standards* such as the ISO (International Organization for Standardization) series sets out environmental management process/procedure frameworks, which can be followed by organizations (on a voluntary basis) to better appeal to customers, and increase product market value.

Regional trade networks can be made aware of the opportunities presented by such standards for regional products. These standards, appropriately employed, can increase profits while reaping positive environmental outcomes.

Gender. Gender is a critical cross-cutting issues for SO#5, particularly in the context of womens' role as principal NRM laborers and decision makers. Women carry out 70-80% of all subsistence farming in Africa (Veit, 1998) and make key daily decisions on land, water and biotic resources. A thorough gender analysis of SO#5 activities will help ensure appropriate approaches towards sustainable management of the natural resource base upon which food security depends. Key issues to consider:

- Make sure agricultural research and extension reach the appropriate customers. A study cited by Veit (1998) found that only 2-10% of Africa's agricultural extension systems reach women. Yet women are responsible for the majority of agriculture labor and decisions;
- Increasing land ownership and land security among women can pay dividends in term of long-term investment in sustaining land productivity;
- By increasing the effectiveness of womens' labor, more time is freed up to tend to family health and educational needs;
- Environmental degradation means that more labor (mostly womens' labor) must be invested in the same land in order to achieve the same yield. By promoting practices and technologies that avoid (or better yet, reverse) land degradation, women will have more time to tend to other family needs; and
- By increasing womens' role in local, national and regional decision-making fora, womens' needs as they relate to food security and natural resource management will be better expressed and incorporated into programs and activities;

Regional approach. As discussed in Section 2, environmental threats are often most effectively addressed within the ecological units in which they are expressed. Swartzendruber et al (1998) asserts that viewing a region as a set of linked ecological units (as opposed to a collection of political units), and attempting to manage them from that perspective makes much more sense from an environmental management approach. Transnational river or lake basin commissions, such as TECCONILE, the Lake Victoria Fisheries Organization, or the recently launched Nile Basin Initiative represent attempts to rationalize such management, and hence might be logical water resource management partners.

Information Technology. The use of computers and the internet hold tremendous potential for sharing of all types of information - including environmental information. By increasing access to information among environmental managers (or networks and partnerships that *should* be environmental managers), knowledge of environmental issues and solutions will be more easily and appropriately brought into planning, implementation and monitoring of regional programs and activities.

3.3.2. SO#6: Enhanced Capacity for Managing Conflict in the Region

The emphasis of this SO focuses on support to African-owned and led conflict prevention, mitigation and response (CPMR) activities in the GHA region. Activities fall into one or more of the following general categories: (a) policy review/reform (GHA-region government policies that affect conflict prevention); (b) capacity building (of African organizations involved in CPMR); (c) collection and dissemination of information (relevant to enabling Africans to more effectively prevent and respond to conflict); (d) research and analysis (into potential sources of and possible solutions to conflict); and (e) pilot CPMR activities (assistance to specific conflict situations and testing of CPMR approaches).

REDSO-managed activities currently underway include two grant programs to support CPMR in the GHA region: (1) the *Conflict Quick Response Fund*, intended to facilitate rapid responses to urgent CPMR needs (e.g., travel or other costs for short-term mediation/negotiation efforts, small meetings/conferences, or rapid assessments of conflict situations) that address existing or potential conflict situations; and (2) the *Conflict Pilot Activities Fund* (CPAF), designed for testing, adapting and replicating longer-term innovative CPMR approaches, as part of a robust transition to development.

The CPAF plans to support activities related to the environmental dimensions of conflict, and includes "conflict over natural resources" as one of its priority focus areas. One pending CPAF activity of note is a grant to the African Centre for Technology Studies (ACTS) to study the ecological sources of political and ethnic conflicts in subsaharan Africa and to promote integration of environmental concerns into regional and international conflict management and resolution activities. The ACTS grant will be managed by the E/NRM Team Leader, and will be linked with related efforts, e.g., Woodrow Wilson Institute of Environmental Security, IUCN, WRI.

The Horn of Africa Support Program (HASP) also supports an *Institutional Strengthening and Grantsmaking Program* (ISGP) that provides institutional strengthening grants and technical assistance toward food security and CPMR work. The ISGP has supported several activities with the Intergovernmental Authority on Development (IGAD) related to environmental issues, such as water resource management capacity building; agricultural production; community-based land husbandry; and conflict/early warning systems.[18]

Another currently ongoing activity, supported under the MOBIS IQC and implemented by MSI, includes analytical studies of key NRM issues as they relate to CPMR. Under this activity, plans to support country-level "environmental flashpoints" studies are planned. To date, one such study has been supported for Tanzania.

Environmental impacts. Activities supported under this SO are varied but generally limited to logistical support (e.g., travel costs), funding of various CPMR fora, studies and analyses, and similar activities with no direct effects on the environment.

Opportunities. While activities envisaged under this SO have little capacity for direct environment impacts, the SO#6 Team (as well as the E/NRM Team) should bear in mind the environmental dimensions of current and potential GHA conflicts (see Section 2.1.5) in designing, selecting, and implementing activities. This has in fact been happening, in the past, as evidenced by effective integration of environmental concerns into CPMR activities, as well as positive interaction between the CPMR and E/NRM teams that has resulted in concrete, synergistic activities. For the future, this linkage should be maintained, and also broadened so that cross-fertilization of ideas occurs between the SO#6

[18] The HASP-funded IGSP supports activities that fall under both SO#5 and SO#6. Activities are managed by members of either SO.

Team and the entire SO#5 Team. Several suggestions are provided that might further strengthen consideration of environmental issues by SO#6 and enhance linkages with SO#5:

- The *Environmental Flashpoints* study conducted in Tanzania is a useful way to raise awareness within countries (and USAID missions) as to the environmental dimensions of conflict, and might also identify potential interventions that suit both bilateral and GHAI objectives;
- Linking MSI (under the MOBIS IQC) and ACTS during the preparation and implementation phase of the proposed ACTS study on "Ecological Sources of Conflict" might serve to ensure that the ACTS study: (1) strengthens the institutional capacity of ACTS; (2) puts forth practical approaches and cases studies for hypothesis (i.e., pilot program) testing; and (3) meets high research quality standards;
- The Drought Monitoring Center (DMC) activity (part of the World Meteorological Organization) managed by the E/NRM team is equally relevant to the SO#6 and SO#5 Teams, and might serve as a link to keep the teams close. Linking the DMC to the USAID/Washington-funded Famine Early Warning System (FEWS) might serve to strengthen both activities. Likewise, the World Food Program maintains a Vulnerability Analysis unit in Nairobi, and the World Bank funds an Arid Lands Monitoring and Rehabilitation program in Kenya. Such links should be established and maintained;
- Continue to work with civil society groups with natural resource and environment-related agendas (as in the case of FONI) as appropriate entry points for promoting control over local resources, accountability of central authorities for environmental policy and management decisions, and resolution of natural resource related conflicts;
- Consider supporting interventions related to improving security of access to productive resources. Land tenure systems where groups of individuals are denied sufficient access to productive resources is a key natural resource issue that may lead to conflict. As such, in areas of conflict, or in food insecure areas with high potential for conflict, an analysis of the prevailing systems of land tenure may help to identify possible sources of conflict, and therefore possible avenues for conflict prevention; Also, it would be most apt to develop pilot implementation activities which tackle innovative approaches towards management of resource conflicts such as the Rahabilitation of Arid Environments Charitable Trust in Baringo, Kenya (RAE 1998);
- Continue to highlight the relationship between conflict and food security to the Food Security (SO#5) Team, and provide input to the SO#5 Team to ensure that their choice of activities remains as relevant as possible to the work of the CPMR (SO#6) Team.

3.3.3. SO#7: Enhanced Regional Capacity to Improve Health Systems

The REDSO Population, Health, and Nutrition (PHN) Program is not limited to the GHA, and covers the entire ESA region. SO#7 focuses on capacity and institutional strengthening of regional partners: Commonwealth Regional Health Community Secretariat; Centre for African Family Studies; and Makerere University. Activities are implemented throughout the region by a large number of Cooperating Agents. No direct health service delivery is involved, nor is any construction. Limited equipment is provided to health care institutions. Some training may include discussion of disposal of some biohazardous wastes (e.g., AIDS blood testing, needles, sharps, condoms). The SO#7 program also includes a nutrition component, which links SO#5 well with SO#7 in terms of the *utilization* dimension of food security.

Environmental impacts. Most SO#7 activities involve training, institutional strengthening and similar activities with no direct effects on the environment. However, while the potential for impact is limited, the REA Closeout Report expressed concern over the non-compliance of the PHN program. The rationale presented by the PHN Team to the REA was that the "buy-in" activities of which the health portfolio consists are all covered by IEE Categorical Exclusions approved for the "parent," Global Bureau-

managed agreement. Any involvement in insecticide-treated bednets will be covered by a programmatic environmental assessment currently being conducted by the Africa Bureau. A dialogue has begun with the Health team and the matter will be addressed during the course of the launching of the new health strategy's implementation mechanisms.

Opportunities. Several potential opportunities for increasing effectiveness of environmental programming are presented:

- An SO-level IEE would appear to be the most effective strategy for achieving compliance. While Field Support mechanism being used to implement most SO#7 activities are generically covered by IEEs approving Categorical Exclusions, local-level validation of that determination by looking at specific activities can verify applicability of the Categorical Exclusion, and provide an opportunity for proactively incorporating environmental concerns into activities;
- Training modules could be added (or strengthened) to include proper procedures for disposal of biohazardous wastes; and for proper water and sanitation practices as they relate to disease transmission;
- Promote integration of health into other "sectors" or SOs as in examples of USAID/Madagascar program linking environmental health and biodiversity; USAID/Angola's health SO dealing with water and sanitation; the nutrition component of REDSO's SO#5; and REDSO-managed refugee relief activities; and
- Population pressure represents a root cause of environmental degradation and biodiversity loss. Activities that help stabilize population will therefore contribute to environmental conservation, and help stem biodiversity loss. Targeting population activities in priority ecosystems (i.e., those that have: high biodiversity; high population density; degraded natural resources; or high food production potential) can increase the overall effectiveness of USAID's (and the GHAI's) sustainable development goals.

Improvements in women and children's health and reductions in fertility overall in REDSO countries can only reflect positively on the country's environmental future, both in relation to USAID programs, and more broadly. Likewise, programs intended to stem the tide of HIV/AIDS will have a salutary effect on the countries' health and economy. However, several explicit steps can be taken to enhance the contributions of health SOs to environmental sustainability in the region, while also enhancing health outcomes. For example,

- First, SO teams involved in promotion of insecticide treated netting (ITN) for malaria control will need to ensure that a Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) is developed. This can be done in conjunction with the national experts and related programs supported by USAID, WHO and other donors, and the Programmatic Environmental Assessment of ITN being organized by AFR/SD. In this way, unintended negative health risks associated with inappropriate insecticide use will be avoided or minimized.
- Second, SO teams could seek to understand better the environmental components of health problems, for example as part of the child survival program. If during the implementation, linkages to environmental changes are established, the SO partners could work to enhance the sustainability and impact of their programs in appropriate ways, such as including education about these linkages in its outreach efforts in child survaival/reproductive health/family planning and HIV/AIDS services.

- Third, SO teams can encourage the Ministry of Health and other appropriate actors to ensure that WHO guidelines and standards are applied to the management of healthcare wastes, esp. those associated with testing and treatment of HIV/AIDS-affected persons.

All these approaches are addressed and encouraged through the environmental review process to which all the SO programs are subjected, and all new implementation mechanisms will be likewise.

Explicit linkages to environmental sustainability and possible synergies with environment programs are not usually sought. However, any activity related to environmental health, such as NRM interventions in CBOs which may benefit by environmental sanitation and health services, could potentially include components of health programs' child survival, malaria, maternal health and HIV/ADIS services, and the like.

3.3.4. SO #8: Effective Services to ESA Missions and Support to Regional Partners

A key function of REDSO staff is to provide support services to client ESA USAID Missions. These services, which may be in the form of TDYs or "virtual" support to country activities, are divided into Core Services and Technical Services. Given REDSO's expanded GHAI role, Technical Services support to USAID missions will be significantly cut back, and priority will be placed on GHAI-related activities, and on "convergence" of missions. Core Services will remain a high priority for REDSO, and will be provided ESA region-wide. This section suggests priority areas for support services, focusing mostly on mandated and potential services provided by the E/NRM Team.

3.3.4.1. Core Services

REDSO Core Services cover a range of functions: legal services; contracting; financial management; food for peace; and environmental compliance. Two of those services will be commented on with respect to environmental considerations: food aid; and environmental compliance.

3.3.4.1.1. Food Aid, Relief Assistance and the Environment

Population dislocations can create and worsen environmental problems. Concentrated refugee populations have been known create irreversible damage to local ecosystems. Thrupp (1997) cited resettlement areas and refugee camps that concentrate large numbers of people as critical areas where the nexus of food and environmental security is particularly apparent. It is in this context that Core Services providers dealing with Food For Peace activities should be well versed in methods for addressing potential and actual environment impacts of food aid and relief assistance. The UNHCR Environmental Guidelines (UNCHR, 1996) reviews environmental problems associated with refugee assistance, and provides operational guidelines on integrating environmental considerations into all phases of refugee assistance, using four key principals: (1) integrated approach; (2) prevention before cure; (3) cost-effectiveness; and (4) local participation. The UNHCR Website contains additional useful information on environmental concerns during refugee operations. *Environmental Guidelines for Small-Scale Activities in Africa* (Knausenberger et al, 1996) provides information on environmental concerns related to relief, resettlement, and food aid. Likewise, the *Environmental Documentation Manual for Title II Cooperating Sponsors Implementing Food-Aided Development Programs* (Bingham et al. 1999) was produced to assist PVOs in meeting the environmental compliance requirements of USAID while also strongly promoting "beyond compliance" behavior in applying environmental review to program design, implementation and monitoring.

3.3.4.1.2. Environmental Compliance

While all USAID officers share part of the responsibility for compliance with the "environmental legal framework" discussed earlier, the Core Service function of "environmental compliance," (as provided by the E/NRM Team, and the Regional Environmental Advisor [REA] in particular), is of central importance.

During the past strategy period, the ESA region benefited from dedicated and innovative REDSO services regarding environmental compliance. The USAID Africa Bureau has been an Agency leader in pioneering progressive and proactive application of Reg. 216 and other parts of the "environmental legal framework" in its programs. As a result, given REDSO's role as a "center of excellence" for environmental compliance, the ESA region is in relatively good shape as concerns the overall environmental compliance situation. An overview of the status of ESA bilateral missions and REDSO IEEs and other Reg. 216 compliance issues are summarized in the former REA's Closeout Report (dated October 20, 1999). The Report provides a number of specific recommendations aimed at improving and building on the success of the past ESA environmental compliance strategies. Following are some broad-scale recommendations on targeting this Core Service:

Environmental Procedures. Proper application of USAID's Environmental Procedures (22 CFR Part 216, Reg. 216) ensures consideration of the effects of all USAID activities on the environment. IEEs in place for REDSO programs have been cited under their associated program component.

The Africa Bureau's *Bureau Environmental Office (BEO) Actions Tracker* is a centralized recording keeping system and resource for all interested parties to obtain information about all environmental review actions taken by the BEO. IEE files are available to the Regional Environmental Officer on CD-ROM as well as via the AFR/SD website for the Strategic Support Objective on Environmental Compliance and Quality. REDSO, in connection with its ICT- and Global Information Infrastructure support systems being developed, intends to provide targeted technical support to regional client missions, drawing on the AFR centralized records, in part, and coordinated with related web-based resources of AFR/SD (FRAME, NRM Experience Tracker, etc.) and G/ENV.

REDSO's E/NRM team intends to develop a Reg. 216 and environmental soundness support system which would allow the REO technical support team to be more responsive to ESA mission needs, better monitor ongoing compliance with IEE conditions, and provide technical support such as:

- host environmental guidance documents, issue briefs, case studies, and/or other program reviews to post once web-site is established;
- web-based information management regarding for REDSO client missions, provided through REDSO, AFR/SD, G/ENV et alia;
- development of country strategic planning guidance
- technical analyses of thematic or site-based issues in environment
- support for mission strategic planning in E/NRM and environmental compliance

Continued emphasis should be placed on the Environmental Management Capacity Building ("ENCAP") approach to environmental compliance that empowers USAID partners, through training and delegation of responsibility, to do sound environmental planning and implementation of their development activities. The ENCAP approach is consistent with the GHAI value of capacity strengthening, and also serves as a stepping stone to broader environmental assessment strengthening activities proposed under the E/NRM component of SO#5.

Another tactic for facilitating and monitoring Reg. 216 compliance, and also for helping teams to explore and capitalize on opportunities to incorporate environmental issues or approaches into their activities is by membership of the REO/REA on all REDSO SO Teams (as well as membership of the team(s) responsible for OFDA and NPC activities). Such membership is provided for in the ADS. While broad cross-membership on SO Teams is desired, the ADS does provide at least this one guaranteed "in" on SO Teams.

Country Strategic Plans. The periodic development of CSPs by USAID bilateral programs is the key juncture at which USAID's environmental agenda must be considered and integrated into mission planning. Appropriate consideration of these environmental factors requires that appropriate mission personnel (i.e. program officers, environment officers, and E/NRM SO team leaders and advisors) are fully conversant in the legal requirements, USAID procedures and policies, and are equipped with the tools to bring these environmental considerations into the development planning process.[19] REDSO (the REA in particular but also the entire E/NRM team) can play a catalytic role in this process by monitoring mission strategic planning cycles, and providing (in a proactive way, as mission staff might not be aware of the advantages [and legal requirements] of environmentally sound strategic planning) timely (i.e., during the pre-planning stage) technical support to the appropriate mission staff. Assistance is particularly critical in cases where new country programs are being developed.

Training. Periodic training of Mission Environment Officers and mission portfolio reviews (during initial visits and based on annual R4 reporting) are useful strategies in working towards ESA-wide compliance with the environmental legal framework. The former REA suggested an E/NRM Team Leader/Advisor and MEO training meeting to be held in conjunction with the next Agriculture/Environment/Private Sector Officer Conference (planned for November 2000).

3.3.4.2. Technical Services

This section focuses on the E/NRM-related technical services outside activities related to environmental compliance. It should be noted that the Core Service activities listed above related to Strategic Planning and Training might also be considered as "Technical Services." However, they have been categorized as a "Core Service" as they are high priority and strategic means of ensuring appropriate consideration of the environment across the ESA region. Given likely significant reductions in the amount of time available for the provision of Technical Services, such categorization might serve to protect these strategic services. As concerns Technical Services, guidance has made it clear that all services much be directly related to REDSO's role as overall GHAI coordinator for the region. Therefore, activities should be in some way related to the convergence of bilateral programs and activities with GHAI objectives and principles. Some suggestions on focus:

Convergence. A number of activities funded by bilateral missions are directly related (and often well-linked) to GHAI and REDSO-supported activities. Examples from the EAC countries include USAID/Kenya and Tanzania support to coastal zone management activities and REDSO's support to WIOMSA; and the GHAI-funded assistance to the EAC in managing Lake Victoria's water hyacinth infestation. It would be a useful exercise to do an analysis of USAID programs in the GHA region in terms of how they address environmental issues relevant to the GHAI, or the extent to which environmental concerns are incorporated into program approaches. Such an analysis might provide a basis for objectively targeting and prioritizing Technical Support, where demand is likely to significantly outstrip supply.

[19] The USAID Global Environment Center is currently developing a *"Users Guide for Considering Environmental Concerns in [USAID] Strategic Planning."* The guide will: (1) compile information on environmental legislation and guidance relevant to the CSP process; (2) summarize and interpret the influence of the legislation and guidance on the process; and (3) provide practical guidance, tools and examples to encourage and facilitate environmentally sound and legally correct strategic planning. Once completed (estimated completion date is June, 2000), the guide can serve as an awareness raising tool as well as practical reference document.

Along these same lines, an annual retreat for GHA mission environment staff (also suggested in the context of environmental compliance for the broader ESA region) would serve as a useful forum to share information and discuss options for harmonizing programs and approaches, exploring opportunities for shared bilateral support to transboundary ecosystems, and various other aspects of convergence.

Maintaining Corporate Knowledge. Historically, REDSO has performed a useful function by maintaining USAID's ground-level "corporate knowledge" of the ESA region in terms of development issues across all sectors. As USAID bilateral missions decline in number, and as REDSO focuses increasingly its own programs and on the GHAI, USAID begins to lose valuable on-the-ground regional perspective and understanding of environmental issues and trends. The E/NRM Team might explore ways to maintain this corporate knowledge. One potential partner is the Africa Bureau's FRAME[20], which offers tools to help capture, retain, and share useful environmental information among a wide range of partners.

International Agreements. Support to mission involvement in supporting national-level capacity to interpret, implement, and capitalize on international environmental agreements is another avenue for promoting regional dialog on environmental issues. While REDSO has appropriately focused on regional intergovernmental organizations as partners, additional opportunities are presented by national participation in - and national obligations to - international conventions. Key conventions for the purposes of the GHAI include: Convention on Biological Diversity; Convention to Combat Desertification; and Framework Convention on Climate Change. These conventions are designed to address global environmental issues through concerted action of national-level members.

According to Veit (1998), national development programs are not yet well-linked to obligations under these conventions. A better understanding of the issues and strategies available can help decision-makers better incorporate these global environmental concerns into national development strategies. Regional organizations might provide an opportunity to harmonize national approaches. In the case of the Convention to Combat Desertification, a number national and regional African partnerships and action plans have already been developed. In theory, funding from the Global Environment Facility is available to support national activities related to operationalization of these agreements. The Department of State has established Regional Environmental Hubs in Addis Ababa, Pretoria and Abidjan. The role of these Regional Environmental Officer is in part to better link the Department of State's Science and Technology Policy with negotiations on international conventions at the regional level.

3.3.5. SO#9: Effective Delivery of U.S. Government Assistance to Non-Presence Countries (NPC)

Non-presence countries that REDSO is responsible for include the GHA countries of Sudan, Somalia, and Burundi. For these countries, REDSO plans for and manages activities under Integrated Strategic Plans (ISPs) for each country. ISPs are a REDSO innovation that allow for shorter-term planning (e.g. three years, as opposed to 5-8 years for CSPs) for transitional "relief to development" activities.

3.3.5.1. Sudan

The first ISP for Sudan 2000-2002 was approved in March 2000. Activities will expand on those conducted under the 1997-1999 ISP, with emphasis on preparing for a transition to

[20] The purpose of FRAME is to "support better decision-making in environment and natural resources in Africa by increasing the effectiveness of already existing information. It is aimed at providing transparency to decision-makers about the costs and benefits of taking one action over another."

peace, while continuing to respond to ongoing conflicts and natural disasters. The proposed ISP goal is *A Less Vulnerable, More Self-Reliant Population Better Prepared for a Transition to Peace*, under which three SOs are set forth. The draft ISP includes a section entitled "Environmental Analysis" that briefly reviews the potential impacts of the ISP program for each SO, as well as a strategy for avoiding and mitigating environmental impacts. The level of analysis done for the ISP is brief, but adequate given the nature of the assistance, and clearly demonstrates that environmental considerations have been incorporated into the planning process (in contrast, the ISP in force for Somalia contains no environmental analysis). Following is a brief summary evaluation of the component SOs with respect to environmental impact potential:

SO#1: Enhanced Environment for Conflict Resolution. Activities envisaged include logistical support to conflict resolution partners; management and governance-related training; small grants to civil society groups that focus on economic rehabilitation or advocacy; and support to media program production. None of these activities are expected to have any direct effects on the environment. It should be noted that civil society groups with environmental agenda may provide useful entry points, as a number of conflicts revolve around universally tangible issues of access to and management of natural resources.

SO#2: Enhanced Food Security through Greater Reliance on Local Resources. This SO will include a range of small-scale activities with varying potential to affect the environment. The specifics of these activities are not known at this time, and fall under IRs 2.1 and 2.2. IR2.1 "Increasing local production of food in target areas" is expected to include: introduction of appropriate agricultural and pastoral technologies; post-harvest handling; and veterinary services. IR2.2 "Increasing the use of markets and trade in meeting local needs" may include: road construction; promotion of food processing technologies; developing marketing information systems; and working towards an enabling environment for microenterprise activity. Of particular note in terms of potential environmental impacts are agricultural and pastoral activities, whose potential impacts include loss of vegetation, soil degradation, and water pollution. Given the ecological fragility of the arid target area, and the already degraded state of some areas, close attention must be paid to avoid practices that lead to further degradation. Road construction (using both development assistance and OFDA funds) presents a number of potential negative environmental impacts such as degradation of soil and water resources (associated with road construction and maintenance); deforestation and loss of biodiversity (associated with (re)opened access to new land areas); and increased spread of disease. Additional activities under this SO (under IR2.3) include relief assistance and food aid, neither of which is expected to have direct effects on the environment (although see Section 3.3.5.1.1). Possible environmental impacts under this SO are addressed in the ISP, as well as in an IEE currently in force for the umbrella grant program which supports activities under this SO (see below).

SO#3: Enhanced Primary Health Care through Greater Reliance on Local Capacities. Activities envisaged under this SO will include training for local government staff; provision of small grants to community group for provision of health services; and delivery of primary health care as part of relief assistance. None of these activities are expected to have significant direct effects on the environment. Should the use of insecticide treated bednets be considered in a malaria control initiative, this use should be linked to the an action plan for mitigation measures identified in the USAID/Africa Bureau Programmatic Environmental Assessment of ITN and malaria control, being prepared in 2000. Likewise, attention should be paid to the proper disposal of biohazardous wastes where this is a pertinent issue.

Environmental Compliance Strategy. The Sudan ISP's strategy for environmental compliance centers around an environmental review process for small grant activities under SO#5, supported by capacity building of the PVO responsible for the ongoing Sudan Transitional Assistance for Rehabilitation (STAR) Program. The STAR Program is currently implemented by CRS, and is covered by an IEE that

runs through FY 2001. The STAR IEE sets forth a standard environmental screening and review process that integrates planning and implementation of small scale activities (Negative Determination with Conditions). The investment in local capacity building embodied in this approach can help set the stage for longer term sustainable local investment and natural resource management. Looking beyond the current STAR program and further into the ISP period, where a similar (and increasingly development-oriented) umbrella grant approach is expected to continue, the environmental review process would seem to be the most appropriate strategy. In the case where road rehabilitation is being supported through OFDA (and outside the STAR Program), while not legally required, USAID policy dictates (and it makes good sense) that the same care be taken to avoid and mitigate against environmental impacts of OFDA activities as with Development Assistance-funded activities. As such, all road rehabilitation activities might be subject to the same environmental screening and review process.

Consistent with support to programs rising out of complex emergencies, a large component of the Sudan ISP depends upon resources other than DA, esp. BHR/OFDA and BHR/FFP Title II Emergency. These resources are technically exempt from environmental compliance. But the emerging consensus is that emergency and transition programs also need to scrutinize and anticipate environmental consequences of their actions. This is the more so in that the program is integrated and links relief to development. Consistent with the need for new and innovative approaches to humanitarian interventions, approaches will be sought to mitigate the potential for unintended environmental harm in ways which enhance the effectiveness of the assistance provided.

Title II for Development PVOs have in recent years undergone intensive upgrading with respect to their compliance with USAID's Environmental Procedures (see the *Environmental Documentation Manual for PL 480 Title II Cooperating Sponsors Implementing Food-Aided Development Programs*, Bingham et al. 1999). Such tools likely can be adapted for the emergency and transition assistance modalities.

3.3.5.2. Somalia

The ISP for Somalia expired September 30, 1999. An interim extension of the ISP is currently being processed for 2002-2002, and the NPC Team plans to have a new ISP in place by FY 2001. The current Somalia ISP is a product of the first ISP process undertaken by REDSO, and strives towards the overarching goal of crisis prevention. The ISP goal is*: A less vulnerable, more self-sufficient population,* which is supported by two subgoals: (1) Improved household food security; and (2) strengthened civil society. The goal and subgoals are supported by two SOs and one Special Objective (SpO). The current ISP, unlike that of Sudan, contains no discussion of environmental issues. According the records of the REA, two IEEs are currently in place for Somalia activities. Following is a brief summary evaluation of the current ISP's component SOs with respect to environmental impact potential:

SO#1: Improved Foundation for Food Crop Production in Target Areas. This SO will include a range of small-scale activities with varying potential to affect the environment under two IRs. Activities under IR2.1 "Improved agricultural infrastructure" may include: rehabilitation of irrigation canals and other water catchments; rehabilitation of farm-to-market (secondary) roads; and land clearing. Activities under IR2.2 "Increased availability of agricultural inputs and services for farmers" may include: farmer education; extension work; and provision of inputs (e.g., seeds, tools, fuel).

Of particular note in terms of potential environmental impacts under these IRs are rehabilitation activities and land clearing, with potential associated negative effects on water, soil, and vegetation. Road construction in particular presents a number of potential negative environmental impacts. Farming systems promoted should avoid practices that may lead to soil and water resource degradation, particularly in view of fragile or already degraded lands.

SO#2: Critical needs met for targeted vulnerable groups. This SO will include a range of small-scale activities with varying potential to affect the environment under four IRs. Activities envisaged under IR2.1 "Improved ability to identify vulnerable groups" include: training; technical assistance; information systems; information dissemination; studies; and institutional support. Activities under IR2.2 "Timely delivery of appropriate food commodities" will be limited to feeding programs; and resettlement packages. Activities under IR2.3 "Increased availability of health services" include: emergency medical service; rehabilitation, supply, and supervision of health centers; immunizations; training; and education/outreach. Potential environmental impacts of these activities appears limited to improper disposal of medical wastes. Activities under IR 2.4 "Increased number of potable water sources and sanitation services" include: water source rehabilitation; well chlorination; construction and/or rehabilitation of latrines; and training. Possible environmental impacts include chemical or bacterial contamination, creation of standing water (which breeds disease-carrying insects), and depletion of water resources.

SpO: Increased Community Capacity to Meet Their Own Needs. The SpO envisages a series of capacity-building activities aimed at local organizations abilities to deal with pressing issues affecting local communities. Activities are expected to be limited to technical assistance and training. None of these activities are expected to have any direct effects on the environment.

Environmental Compliance Strategy. Update of the ISP should follow the model of the Sudan ISP, which incorporates a general review of environmental issues up front. As concerns the potential environmental consequences, and the need for sound planning, of the wide range of small-scale activities to be supported, an environmental screening and review process similar to that employed for Sudan activities is recommended. Such an approach has the dual advantage of promoting sound environmental planning so that activities are less likely to adversely affect the environment, and also building local capacity in environmental assessment.[21]

3.3.5.3. Burundi

There is currently no ISP requirement for Burundi. Activities are limited to support to the Great Lakes Justice Initiative (GLJI) as well as limited humanitarian relief activities. The GLJI which seeks to support efforts in the DRC, Rwanda, and Burundi to develop impartial, credible, and effective systems of justice. Support to the GLJI involves approaches with no potential environmental impacts.

Environmental Compliance Strategy. None required at present.

[21] The former REA's Closeout Report (Bingham 1999) cites two Somalia-based projects (Health and Nutrition project [649-0143]; Somalia Rehabilitation and Recovery Project [649-0139]) with no record for previous IEEs.

Annex A

USAID/REDSO Strategy Environmental Threats and Opportunities Assessment with Special Focus on Biological Diversity and Tropical Forestry

Scope of Work

1. Background

Strategic Planning Process. The USAID Regional Economic Development Services Office/East and Southern Africa (REDSO/ESA) is currently in the process of developing a five-year strategic plan. REDSO/ESA is a service-oriented USAID regional field mission, providing technical support to bilateral missions,[22] managing activities in non-presence countries,[23] and managing regional programs.[24] The new plan is expected to embrace increased emphasis of REDSO services towards managing and implementing regional initiatives such as the Greater Horn of Africa Initiative (GHAI) and the expanded humanitarian and transition programs in Somalia, Sudan and Burundi. Also, with the African regional institutional renaissance in full bloom, REDSO/ESA plans to take advantage of increased opportunities for regional partnerships and concomitant development impact.

Environmental Requirements. The core environmental requirements of USAID operating unit strategic plans are spelled out in ADS 201.5.10g, and are derived from provisions of the Foreign Assistance Act (FAA).

- Environmental Sustainability. USAID recognizes that concern for the environment and wise management of the natural resources base are absolute requirements of any successful development program. Section 117 of the FAA *"Environment and Natural Resources,"* dictates that efforts be made to maintain (and restore) natural resources upon which economic growth depends, and to consider the impact of USAID's activities on the environment. The legal requirements of the FAA are reflected in USAID's *ADS Chapter 204 "Environmental Procedures,"* which provides essential procedures and policy on the application of *22 CFR Part 216* which codifies the Agency's procedures "to ensure that environmental factors and values are integrated into the A.I.D. decision making process." Accordingly, USAID conducts assessments to ensure that its environmental priorities are incorporated into results planning, achieving, and monitoring. Clearly, the planning stage is the first and best opportunity to ensure that such factors are appropriately considered.

- Tropical Forestry and Biological Diversity. Sections 118 *"Tropical Forests"* and 119 *"Endangered Species"* of the FAA codify the more specific U.S. interests in forests and biological diversity. These two provisions require that all country plans include: 1) An analysis of the actions necessary in that country to conserve biological diversity and tropical forests; and 2) The extent to which current or proposed USAID actions meet those needs. Section 118/119 analyses are specific legal requirements of all USAID operating unit strategic plans. It should be noted that 22 CFR 216.5 requires USAID to conduct their assistance programs in a manner that is sensitive to the protection of endangered or threatened species and their critical habitats.

Translating the intent of the above legal requirements into a practical strategic planning approach, the ADS provides a priority-setting framework for missions to use in determining environmental threats and

[22] Client USAID Bilateral Missions include those in Angola, Botswana, D.R. Congo, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe.
[23] Non-presence countries include: Burundi, Djibouti, Eritrea, Somalia, and Sudan.
[24] Regional programs include the Greater Horn of Africa Initiative (GHAI) and others.

opportunities (See 201.5.8; and Supplementary References, Joint Planning and Guidelines for Strategic Plans, and Technical Annex B Environment, dated February 1995). The priority-setting process is intended to guide the setting of environmental strategic objectives, as well as to inform strategic objectives in other sectors. However, both the ADS and Supplementary References clearly focus on bilateral mission, country-specific programs. Due to the different nature of its mission, REDSO must first interpret, adapt, and apply these requirements in a way that will add value – and legal compliance -- to its new strategy.

REDSO/ESA Assessment Needs. The REDSO strategy's environmental requirements can be viewed within the framework of the types of assistance it provides:

- Technical Support to Bilateral Field Missions. Each mission should have a current CSP that includes relevant environmental analysis (at least in theory). Here, a review of individual country analyses for common themes/issues can ensure that REDSO's environmental technical support services are appropriately targeted.

- Activities in Non-Presence Countries. Some effort needs to be devoted to gathering threats and opportunities information on non-presence countries, which should in turn inform the activities being implemented in that country.

- Regional Programs and Activities. Threats and opportunities Information from the countries encompassed by a particular program should inform the regional program.

2. Purpose and Objectives of Review

The tasks embodied in this SOW represents a practical step to further advance the REDSO/ESA Strategic Plan by providing an assessment of the environmental threats and opportunities within REDSO's geographic and programmatic scope of responsibility; as well as by ensuring basic compliance with the environmental provisions of the FAA.

3. Scope of Work

The Environmental Threats and Opportunities Assessment will include three interrelated activities, each explained below:

a) Review and compile information on environmental threats and opportunities relevant to specific country situations.
Review existing documentation, and Mission-level CSP environmental analyses. Gather and review information on non-presence countries (and on countries where appropriate Mission-level analyses have not been done). The intent of this review is to identify and document common issues/themes in the region as potentially relevant regional entry-points for REDSO efforts.

b) Conduct an environmental review of proposed REDSO/ESA strategy components.
Review proposed REDSO SOs and SSOs (technical assistance; regional program implementation; non-presence country activities, etc.) from environmental compliance perspective. Identify any critical factors/linkages; transboundary issues; areas of opportunity in both environmental and other programmatic areas. The intent of this review is to identify and/or emphasize environmental threats and opportunities relevant to REDSO's strategy and services.

c) Identify proactive means to capitalize on environmental programming opportunities.
Analyze issues arising from the above review processes to identify actions that REDSO can take to address basic USAID environmental goals, and to capitalize on development opportunities to

go beyond basic compliance to maximize regional development results. The intent of this analysis will be to provide specific recommendations to REDSO planners that can enhance the strategic plan by better incorporating environmental programming.

4. Specific Tasks and Responsibilities

The Assessment will be carried out by a USAID Environment Officer with experience in strategic planning and sound knowledge of environmental policies and legislation relevant to the USAID strategic planning process. The Assessment activity will be carried out as a TDY to the REDSO Mission during the period January 16 – February 4, 2000, plus an additional TDY day on March 1, 2000 (following a separate TDY to USAID/Tanzania).

In addressing the SOW components, the Environment Officer will work under the direction of Diana Putman (Regional Program Officer) and Shirley Erves (Regional M&E Officer), who together are responsible for coordination the overall REDSO strategic planning process). Additional technical guidance will be provided by Daniel Evans (Environment and Natural Resource Team Leader), Walter Knausenberger (Regional Environmental Advisor [REO]),
Dennis McCarthy (Agriculture Team Leader), and Vic Duarte (Private Sector Officer).

The Environment Officer will review relevant literature/documents and meet and/or gather information from relevant REDSO staff, bilateral mission staff, USAID/W staff, and appropriate program partners and beneficiaries.

5. Level of Effort

The Assessment will be conducted by Daniel Moore, a USAID Environment Officer with experience in preparation of country strategic plans and familiarity with the legal framework for the environmental considerations of such plans. Mr. Moore also has prior field experience in the region, having served as Team Leader for USAID/Uganda's Environmental Strategic Objective. Mr. Moore is a U.S. Direct Hire employee of USAID.

Total Level of Effort:	30 days	
(in-country #6)	20 days	(1/16/00 – 2/4/00)
(in-country #5)	2 days	(2/29/00 – 3/1/00)
(in Washington)	10 days	(addition LOE over period 1/1/00 – 3/1/00)

6. Deliverables

Prior to the departure from country, the Environment Officer will debrief relevant REDSO staff, presenting summary findings and recommendations. A final report, limited to 25 pages in length (excluding annexes), addressing each component activities of this SOW, will be provided to REDSO/ESA prior to departure from country on February 4. 1999. Any necessary follow-up will be addressed on March 1, 2000.

REDSOSOW.DOC

Annex B

Reference and Resource List – REDSO/ESA Regional and Country and Regional Environmental Issues

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2. CIA World Factbook - http://www.odci.gov/cia/publications/factbook/ao.html
3. Conservation International (Home Page). http://conservation.org/. Biodiversity Hotspots. http://conservation.org/hotspots/default.htm
4. Environmental Information Systems - Sub-Saharan Africa. The EIS-SSA program aims at developing African capacity for the management of environmental information as an integral component of the sustainable development process - http://www.grida.no/prog/global/eis-ssa/contry/.htm
5. FRAME (USAID/AFR/SD) Website. http://www.frame-web.org/
6. Index on AFRICA - a comprehensive guide to the continent
7. IPE Net offers extensive data sources for news and analysis on Southern Africa and the Horn of Africa.
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15. WWF Global 2000 Project. http://www.panda.org/livingplanet/global200.html; Living Planet Resources: http://www.panda.org/livingplanet/lpr99/download.html
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    or to see Kenyan data, http://www.globe.gov/sda-bin/wt/ghp/nav+L(en)?h=2&c=KE

Annex C

List of Persons Contacted

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Carl Gallegos	AFR/SD Bureau Environmental Coordinator
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Leroy Duval	G/ENV/ENR Technical Advisor
Paul des Rosiers	G/ENV Bureau Environment Officer
Mary Rowen	G/ENV/UP Consultant
John McMahon	LAC/RSD-E Natural Resource Officer
Bob Buzzard	USAID/Uganda E/NR Team Leader
Melissa Othman	USDA Forest Service International Programs/Africa
Bob Winterbottom	IRG/EPIC Environmental Consultant
Agi Kiss	World Bank Africa Environment Program Officer
Terry Capucelli	USAID Library/LRC
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Jim Walsh	REDSO/ESA Sudan FFP Officer
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Vic Duarte	REDSO/ESA Private Sector Team Leader
Wanjiku Muhato	REDSO/ESA Gender Advisor
John Dunlop	REDSO/ESA Nutrition/Food Security
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Eastern Arc Mountains Environmental Monitoring Project (Kenya, Tanzania)

Joseph Mwangi	Kenya Institute of Forestry Research
Gerry Hertel	USDA Forest Service Assoc. Director Forest Health Centre
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Keith Douce	University of Georgia Professor & Extension Entomologist

Table 1: Geographic Priorities for Biodiversity Conservation – ESA Region[25,26]

MAJOR HABITAT UNITS	BIOGEOGRAPHIC REGION	KEY COUNTRY OR REGION
Tropical Moist Lowland Forest		
Congo Rain Forest	Congo Basin	Central African Region
Malagasy Rain Forest	Madagascar	Madagascar[a]
Tropical Moist Montane Forest		
East African Highlands	Eastern Africa	Tanzania[a], Kenya[b], Uganda[b]
Tropical Dry Forests		
Malagasy Thorn Forest	Madagascar	Madagascar[a]
Xeric Formations		
Kalahari and Namib Deserts	Southern Africa	Southern African Region
Woodland/Savanna		
South African & Miombo	Southern Africa	Southern African Region
East African	Eastern Africa	Tanzania[a], Kenya[b], Uganda[b]
Mediterranean Scrub		
Cape Sclerophyll	Southern Africa	Southern African Region
Wetlands		
Rift Lakes	Eastern Africa	Tanzania[a], Kenya[b], Uganda[b]
Okavango	Southern Africa	Southern African Region
Kafue Flats	Southern Africa	Southern African Region
Not represented: Ethiopian Highlands		

[a] Among the 25 most species-rich countries (according to World Conservation Monitoring Centre).
[b] Among the 25 next-most species rich countries.

[25] Table adapted from draft USAID Biodiversity Conservation Policy and Strategy of 9/26/96.
[26] Key criteria for identification of countries and regions included: (1) ensuring representation from different geographic (i.e. biogeographic region such as "Eastern Africa) and habitat types (e.g. tropical moist montane forest, coral reef); (2) Selection of individual countries to represent different types of ecosystems and habitat types (the rationale being the while ecosystems are often transboundary in nature, USAID assistance is usually provide on a country basis; and (3) Non-biological factors such as country commitment and need, and USAID presence.

Table 2: Key Areas for Biodiversity Conservation in Africa – ESA Region[27]

HABITAT/AREA	ESA COUNTRIES	KEY CHARACTERISTICS
Guineo – Congolean Tropical Moist Forests		Highest species diversity
Central African Rainforests	DRC	Lowland forests most species-rich in Africa
Cape Fynbos Region	RSA	8,500 species of plant, 70% endemism; 20% of area protected
Afromontane Regions		Distinctive flora; high degree of endemism
Ethiopian Highlands	Eth	Largest Afromontane area
Albertine Rift Highlands	Uga; DRC; Bur; Rwa	Rich transitional flora and fauna; high bird endemism; significant protected areas (PAs)
Imatongs – Usambara	Tnz; Ken; Uga; Sud	Important for endemic plants; Imatong Mtns (Sudan) and Usambaras (Tanzania) of particular importance.
Uluguru – Mulanje	Tnz; Mal	Rich endemic flora; poor PA coverage
Angolan Highlands	Ang	Distinctive; little-known scientifically; No PAs
Drakensberg Mountains	RSA	Wide range of vegetation types – 300 endemics; includes 200,000 ha of PA
Somali – Masai Region	Dji;Som; Ken;Uga;Tnz	Floristically rich, around 50% endemism of 2,500 flowering plants
Zambezian Region	Southern Afr. +Tnz	Diverse fauna, flora (8,500 species); less endemism than Central African Rainforest; important PAs
Karoo – Namib Region	Ang; Nam; RSA;	Rich flora (3,500 species), 50% endemism, partially protected within PAs
Sudanian Region	DRC; Uga; Sud; Eth	Bounded by Sahara desert and Central African Forests; reasonably rich in fauna
Coastal East Africa	Som; Ken; Tnz; Moz	Botanically rich, 40% endemism; significant marine biodiversity; inadequate PA coverage
Freshwaters		Extensive inland waters in Africa
Soudainian or Nilotic Region	Ken; Uga; Sud; Eth	High fish diversity moderate levels of endemism
Zaire River Basin	DRC	High fish diversity (possibly over 1,000) with high endemism
Great Lakes	DRC;Uga; Ken;Tnz;Mal	Very high fish diversity, large number and percentage of endemics due to haplochromine cichlids
Madagascar	Mad	"Megadiversity" country; high species diversity and endemism in both flora and fauna, extensive PA network

[27] Table adapted from Biodiversity in Subsaharan Africa and its Islands (IUCN, 1990).

Annex D-3

Table 3: GHA Watershed Environmental Profiles (1)

Watershed (Countries)	Area (km^2)	Population Density (per km^2)	Urban Growth Rate (%)	Large Cities	Total Fish Species (2)	Fish Endemics (2)	Threatened Fish (2)	Endemic Bird Areas	Ramsar Sites	Protected Areas (%)	Wetlands (%)	Arid (%)	Forest (%)	Cropland (%)	Irrigated Cropland (%)	Developed (%)	Shrub (%)	Grassland (%)	Barren (%)	Loss of Original Forest (%)	Deforestation Rate (%) (3)	Eroded Area (%)	Large Dams	Planned Major Dams
Congo Watershed: Lake Tanganyika Subbasin (DRC;Rwa;Bur;Tnz;Zam)	273,156	33	8.8%	3	240	216	0	4	0	9%	18%	0%	12%	31%	0%	<1%	2%	53%	1%	54%	13%	3%	0	NA
Jubba Watershed (Eth;Som;Ken)	497,655	12	NA	0	34	3	0	5	2	2%	4%	72%	3%	5%	0%	<1%	55%	35%	3%	70%	2%	6%	0	NA
Nile Watershed (Egy;Sud;Eri;Eth;Ken;Tnz;Uga;Rwa;Bur;DRC;CAR)	3,254,555	44	4.0%	30	129	26	0	5	2	5%	6%	67%	2%	10%	5%	1%	4%	52%	30%	91%	6%	5%	1	NA
Nile Watersehd: Lake Victoria Subbasin (Uga;Ken;Tnz;Rwa;Bur;DRC)	283,168	160	4.7%	4	343	309	26	4	1	17%	31%	26%	9%	40%	0%	1%	10%	37%	2%	89%	7%	8%	1	0
Shaballe Watershed (Eth;Som)	336,627	28	5.0%	1	27	0	0	3	0	1%	2%	81%	1%	6%	0%	<1%	73%	16%	4%	88%	1%	9%	0	NA
Lake Turkana Watershed (Eth,Sud;Ken,Uga)	209,157	59	NA	0	47	17	0	3	0	9%	6%	33%	12%	20%	0%	<1%	26%	28%	13%	60%	3%	11%	1	NA

Notes

(1) Table adapted from Revenga et al (1998) *Watersheds of the World*

(2) Nile Watershed data for Nile River only

(3) Rate of forest loss for period 1980-90

ANNEX D-4

Table 4: ESA Country Forest Resource Profiles (1)

Region/Country	Forest and Other Wooded Land 1990 Extent (000 ha)	Forest Area					
		Total Forest		Natural Forest		Plantation Forest	
		1990 Extent (000 ha)	Annual % Change (1981-90)	1990 Extent (000 ha)	Annual % Change (1981-90)	1990 Extent (000 ha)	Annual % Change (1981-90)
GHA	**231,807**	**100,270**		**99,402**		**868**	
Burundi	1,314	325	2.5	233	(0.6)	92	59.4
Djibouti	1,320	22	0.0	22	0.0	0	X
Ethiopia	41,991	14,354	(0.2)	14,165	(0.3)	189	17.5
Kenya	16,816	1,305	(0.4)	1,187	(0.5)	118	1.6
Rwanda	946	252	1.8	164	(0.2)	88	9.4
Somalia	15,945	758	(0.4)	754	(0.4)	4	0.0
Sudan	68,955	43,179	(1.0)	42,976	(1.0)	203	7.6
Tanzania	68,497	33,709	(1.2)	33,555	(1.2)	154	12.5
Uganda	16,023	6,366	(0.9)	6,346	(0.9)	20	0.0
Southern Africa	**483,906**	**233,995**		**232,509**		**1,486**	
Angola	77,198	23,194	(0.7)	23,074	(0.7)	120	0.9
Botswana	26,561	14,262	(0.5)	14,261	(0.5)	1	0.0
D. R. Congo	166,076	113,317	(0.6)	113,275	(0.6)	42	16.7
Malawi	3,724	3,612	(1.1)	3,486	(1.3)	126	12.4
Mozambique	55,881	17,357	(0.7)	17,329	(0.7)	28	5.4
Namibia	26,296	12,569	(0.3)	12,569	(0.3)	0	X
South Africa	41,543	8,208	(0.5)	7,243	(0.8)	965	1.9
Swaziland	146	146	0.0	74	0.0	72	0.1
Zambia	60,337	32,349	(1.0)	32,301	(1.0)	48	7.8
Zimbabwe	26,144	8,981	(0.6)	8,897	(0.6)	84	2.0
Insular Africa	**23,269**	**16,011**		**15,785**		**226**	
Madagascar	23,225	15,999	(0.8)	15,782	(0.8)	217	1.7
Mauritius	44	12	1.3	3	0.0	9	1.8

(1) Table Adapted from Veit et al (1998) *Africa's Valuable Assets*

Table 5: Environmental Profiles of Selected REDSO/ESA Client Countries

Country	Key Environmental Threats (1)	International Agreements (2)	NEAP (3)			Biodiversity Index (4)			Original Forest as % of Land Area (8)	1996 % Forest Cover (8)	% PA (5)	% Urban (6)	SO (from FY 99 R4s) receiving environment sector funds	Funding (in U.S. 000,000) (9)					CSP (7)	
			DP	IP	FA	M	B	P						FY 96	FY 97	FY 98	FY 99	FY 00	FAA	Date
Greater Horn of Africa Client Countries																				
Eritrea	Deforestation; desertification; soil erosion; overgrazing; loss of infrastructure from civil warfare	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, *signed but not ratified:* none of the selected agreements		Y		*112* *X* *6*	*319* *0* *3*	*X* *X* *X*	*X*	*X*	*5.0%*	*19.0%*	SO 1 Increased Income Through the Growth of Rural Enterprise in Target Areas (1996-97)	9.4 8.8/2.4	0.8 0.8				N	95-01 (est)
													SO 2 Increased Capacity for Democratic Governance (1996-97)	0.6/0.6	0.0					
													SO 2 Increased income from enterprises, primarily rural, with emphasis on exports			0.3/2.8	0.2/1.9	0.3/4.1		
Ethiopia	Deforestation; overgrazing; soil erosion; desertification	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Ozone Layer Protection *signed, but not ratified:* Environmental Modification, Law of the Sea, Nuclear Test Ban	*SS*			*255* *31* *35*	*626* *28* *20*	*6500* *1000* *153*	*24.5%*	*17.3%*	*5.5%*	*18.0%*	SO1: Increased Availability of selected Domestically Produced Food Grains	0.4 0.4/4.5	2.0 ?	0.8 0/0	2.4 1.9/5.5	0.5 0.5/3.0	N	95-03 (est)
													SO 4: Increased Access to and Participation in a Democratic System	0.0		0.3/17.7	0.0/2.0	0.0/2.4		
													SpO 1: Enhanced Household Food Security in target areas	0.0	?	0.5/0.6	0.5/0.5	0.0/0.3		
Kenya	Water pollution from urban and industrial wastes; degradation of water quality from increased use of pesticides and fertilizers; deforestation; soil erosion; desertification; poaching	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Law of the Sea, Marine Dumping, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling *signed, but not ratified:* None of the selected agreements			Y	*359* *21* *43*	*844* *6* *24*	*6000* *265* *158*	*16.8%*	*18.5%*	*6.2%*	*33.0%*	SO4.0: Integrated and sustainable natural resources management in priority areas (formal approval not expected until mid 2000)						Y	96 - 00
													SO 2: Increased Commercialization of Small holder Agriculture and Natural Resource Management	0.8/4.0	0.8/?	2.9/7.1	0.8/4.0	2.9/8.6		
													SpO: Meet the Critical Needs of Kenyans Affected by the Nairobi Bombing and Build Capacity to Address Future Disasters				14.0/23			
Rwanda	Deforestation results from uncontrolled cutting of trees for fuel; overgrazing; soil exhaustion; soil erosion, widespread poaching	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Nuclear Test Ban *signed, but ratified:* Law of the Sea	*SS*			*151* *0* *9*	*513* *0* *6*	*2288* *26* *0*	*36.1%*	*16.1%*	*14.7%*	*60.0%*	SO 1 Increased rule of law and transparency in governance SO 2 Increased primary health care and social service utilization in target regions SO 3 Increased ability of rural families in targeted communities to improve household food security						N	97-99 (ISP)
Tanzania	Soil degradation; Deforestation: Desertification, Destruction of coral reef's threatens marine habitats, Recent droughts affected marginal agriculture	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Nuclear Test Ban, Ozone Layer Protection *signed, but not ratified:* none of the selected agreements			Y	*316* *12* *33*	*822* *24* *30*	*1000* *0* *1122* *406*	*22.4%*	*9.1%*	*15.6%*	*28.0%*	SO2: Foundation Established for the Adoption of Environmentally Sustainable Natural Resources Management Practices in Tanzania		3.5/0.0	4.0/0.0	2.5/0.0	3.8/0.0	Y	97 - 03
													SO 1: Strengthen Natural Resource Management Capacity	4.1/0.0						
Uganda	Draining of wetlands for agricultural use; deforestation; overgrazing; soil erosion; poaching is widespread	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection *signed, but not ratified:* Environmental Modification			Y	*338* *6* *18*	*830* *3* *10*	*5000* *X* *6*	*70.0%*	*4.4%*	*9.6%*	*14.0%*	SO1: Increased Rural Household Incomes	4.1 0.5/9.0	6.4 ?	2.0 0.0/13.2	6.7 0.8/11.7	8.6 0.0/14.3	Y	97 - 01
													SO2: Critical Ecosystems conserved	3.6	?	2.0/0.0	5.9/0.0	8.6/0.0		
GHA Non-Presence Client Countries																				
Burundi	Soil erosion as a result of overgrazing and the expansion of agriculture into marginal lands; deforestation (little forested land remains because of uncontrolled cutting of trees for fuel;) habitat loss threatens wildlife populations	*party to:* Biodiversity, Climate Change, Desertification, , Endangered Species, Hazardous Wastes, Ozone Layer Protection *signed but not ratified:* Law of the Sea, Nuclear Test Ban	*SS*			*107* *0* *5*	*451* *0* *6*	*2500* *X* *1*	*46.3%*	*35.0%*	*5.6%*	*9.0%*							N	93 - 00
Somalia	Famine; use of contaminated water contributes to human health problems; deforestation; overgrazing; soil erosion; desertification	*party to:* Endangered Species, Law of the Sea *signed, but not ratified:* Marine Dumping, Nuclear Test Ban			Y	*171* *11* *18*	*422* *10* *8*	*3000* *500* *57*	*42.0%*	*0.0%*	*0.3%*	*27.0%*							N	97-99 (ISP)

Table 5: Environmental Profiles of Selected REDSO/ESA Client Countries

Country	Key Environmental Threats (1)	International Agreements (2)	NEAP (3)			Biodiversity Index (4)			Original Forest as % of Land Area (8)	1995 % Forest Cover (8)	% PA (5)	% Urban (6)	SO (from FY 99 R4s) receiving environment sector funds	Funding (in U.S. 000,000) (9)					CSP (7)	
			DP	IP	FA	M	B	P						FY 96	FY 97	FY 98	FY 99	FY 00	FAA	Date
Sudan	Inadequate supplies of potable water; wildlife populations threatened by excessive hunting; soil erosion; desertification	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Law of the Sea, Nuclear Test Ban, Ozone Layer Protection *signed, but not ratified:* none of the selected agreements	*NA*			*267* *11* *21*	*680* *0* *9*	*3132* *50* *8*	*12.0%*	*0.0%*	*3.6%*	*36.0%*							N	00-02 (ISP)
GHA Non-Client Countries																				
Djibouti	Inadequate supplies of potable water; desertification	*party to:* Biodiversty, Climate Change, Desertification, , Endangered Species, Law of the Sea, Ship Pollution		*Y*		*NA*	*NA*	*NA*			*NA*	*NA*							-	-
Southern Africa Client Countries		none of the																		
Angola	The overuse of pastures and subsequent soil erosion attributable to population pressures; desertification; deforestation of tropical rain forest, in response to both international demand for tropical timber and domestic use as fuel, resulting in loss of biodiversity; soil erosion contributing to water pollution and siltation of rivers and dams; inadequate supplies of potable water	*party to:* Biodiversity, Desertification, Law of the Sea *signed, but not ratified:* Climate Change	*NA*			*276* *7* *17*	*765* *13* *13*	*5000* *1260* *25*	*19.8%*	*15.3%*	*6.6%*	*34.0%*	SO1: Increased Resettlement, Rehabilitation and Food-crop Self-reliance of War-torn Angolan Communities	7.9 0.2/5.3	8.3 0.2	8.1 0.2/13.1	9.3 0.5/7.2	9.9 0.4/5.6	N	98-01 (update)
Botswana & RCSA	Overgrazing; desertification; limited fresh water resources	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Nuclear Test Ban, Ozone Layer Protection *Signed but not ratified*: none of the selected agreements		*Y (NCS)*		*164* *0* *5*	*386* *0* *7*	*X* *17* *4*	*21.0%*	*100.0%*	*18.5%*	*74.0%*	SO3: Accelerated regional adoption of sustainable agriculture and NRM (RCSA) SpO1 Increased Regional Capacity to Manage Transboundary Natural Resources (RCSA)	 5.1/3.7 0.0	 ?	 5.0/2.7 2.0/0.0	 6.1/1.9 2.0/0.0	 3.4/3.1 3.0/0.0	Y	00-05 (under review)
DRC	Poaching threatens wildlife populations; water pollution; deforestation; refugees who arrived in mid-1994 were responsible for significant deforestation, soil erosion, and wildlife poaching in the eastern part of the country (most of those refugees were repatriated in November and December 1996)	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Nuclear Test Ban, Ozone Layer Protection, Tropical Timber 83, Tropical Timber 94, Wetlands *signed, but not ratified:* Environmental Modification	*SS*			*415* *28* *38*	*929* *22* *26*	*11,00* *0* *1100* *7*			*4.5%*	*30.0%*	SO 1 The successful transition to a stable nation experiencing increasingly broad benefits from improving social and economic conditions CARPE Progam: DRC also covered by AFR/SD regional forest conservation program CARPE						Y	99-00
Madagascar	Soil erosion results from deforestation and overgrazing; desertification; surface water contaminated with raw sewage and other organic wastes; several species of flora and fauna unique to the islands are endangered	*party to:* Biodiversity, Desertification, Endangered Species, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection *signed, but not ratified:* Climate Change, Law of the Sea				*105* *84* *46*	*202* *104* *28*	*9000* *6500* *189*	*92.6%*	*13.1%*	*1.9%*	*30.0%*	SO3: Biologically-Diverse ecosystems preserved in priority Conservation Zones	5.6	6.3	7.0/1.5	7.0/0.0	8.5/0.0	Y	98 - 02
Malawi	Deforestation; land degradation; water pollution from agricultural runoff, sewage, industrial wastes; siltation of spawning grounds endangers fish populations	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Environmental Modification, Hazardous Wastes, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection, Wetlands *signed but not ratified:* Law of the Sea			*Y*	*195* *0* *7*	*521* *0* *9*	*3600* *49* *61*	*12.2%*	*0.0%*	*11.3%*	*15.0%*	SO1: Increased agricultural incomes on a per capita basis SO2: Increased Sustainable Use, conservation and Management of Natural Resources	5.3	7.5	9.4/0.0	7.9	8.9	Y	95 - 00
Mozambique	A long civil war and recurrent drought in the hinterlands have resulted in increased migration of the population to urban and coastal areas with adverse environmental consequences; desertification; pollution of surface and coastal waters	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Ozone Layer Protection *signed, but not ratified:* none of the selected agreements	*Y*			*179* *1* *13*	*498* *0* *14*	*5500* *219* *92*	*33.2%*	*13.6%*	*6.1%*	*40.0%*	SO1: Increased Rural Household Income in Focus Areas *Proposed SO2: Increased Capacity for Sustainable Natural Resources Management*	6.3 6.3/11.6	4.1 4.1	6.1 6.1/14.7	5.1 3.1/16.7 2.0/0.0	8.5 4.0/19.0 4.5/0.0	Y	96 - 01

Table 5: Environmental Profiles of Selected REDSO/ESA Client Countries

Country	Key Environmental Threats (1)	International Agreements (2)	NEAP (3)			Biodiversity Index (4)			Original Forest as % of Land Area (8)	1996 % Forest Cover (8)	% PA (5)	% Urban (6)	SO (from FY 99 R4s) receiving environment sector funds	Funding (in U.S. 000,000) (9)					CSP (7)	
			DP	IP	FA	M	B	P						FY 96	FY 97	FY 98	FY 99	FY 00	FAA	Date
Namibia	Very limited natural fresh water resources; desertification	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Ozone Layer Protection, Wetlands *signed but not ratified:* none of the selected agreements	*Y*			*154* *3* *11*	*469* *1* *8*	*3128* *X* *23*	*0.0%*	*95.3%*	*12.9%*	*41.0%*	SO1: Increased Benefits of Historically Disadvantaged Namibians from Sustainable Local Management of Natural Resources	0.1	0.1	.4/0.0	3.1/0.0	2.0/0.0	Y	96 - 00
South Africa	Lack of important arterial rivers or lakes requires extensive water conservation and control measures; growth in water usage threatens to outpace supply; pollution of rivers from agricultural runoff and urban discharge; air pollution resulting in acid rain; soil erosion; desertification	*party to:* Antarctic-Environmental Protocol, Antarctic Treaty, Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling *signed, but not ratified:* none of the selected agreements	*Y*			*247* *27* *33*	*596* *8* *16*	*2300* *0 X* *953*	*12.8%*	*0.2%*	*5.4%*	*50.0%*	SO4: Improved Capacity of Key Government and Non-government Entities to formulate, Evaluate and Implement Economic Policies	8.8	3.0 ?	6.5 0.0/8.5	8.6 0.0/0.0	5.6 0.0/3.7	N?	96 - 05
													SO6: Increased Access to Environmentally Sustainable Housing and Urban Services for the Historically Disadvantaged Population	— 8.8/7.5	?	3.9/0.0	8.6/0.1	5.6/0.2		
Zambia	Air pollution and resulting acid rain in the mineral extraction and refining region; poaching seriously threatens rhinoceros and elephant populations; deforestation; soil erosion; desertification; lack of adequate water treatment presents human health risks	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Nuclear Test Ban, Ozone Layer Protection, Wetlands *signed, but not ratified:* Climate Change-Kyoto Protocol	*Y*			*229* *3* *11*	*605* *1* *10*	*4600* *211* *9*	*71.0%*	*70.1%*	*8.6%*	*45.0%*	SO 1 Increased sustainable rural incomes			13.8/5.8	2.0/5.1	1.2/7.5	Y	97-01
													SO 1 The State Removed Provision of Private Goods and Services	0.4 0.2/3.5	0.4 ?					
													SO 2 Increase the Productive Participation of Rural Enterprises and Communities in the National Economy	0.2/17.1	?					
													SO 3 Increased use of integrated child and reproductive health and HIV/AIDS interventions							
													SO 4 Expanded opportunity for effective participation in democratic governance							
Zimbabwe	Deforestation; soil erosion; land degradation; air and water pollution; the black rhinoceros herd - once largest concentration of the species in the world - has been significantly reduced by poaching	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Law of the Sea, Ozone Layer Protection *signed, but not ratified:* none of the selected agreements	*Y*			*270* *1* *9*	*532* *0* *9*	*4200* *95* *94*	*70.0%*	*67.3%*	*7.9%*	*35.0%*	SO1: NRM Strengthened for Sustainable Rural Development for CAMPFIRE Communities	3.8/1.3	4.5/0.0	2.9/0.0	0.0/0.0	0.0/0.0	Y	97 - 03
ESA Other Countries																				
Comoros	Soil degradation and erosion results from crop cultivation on slopes without proper terracing; deforestation	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Ozone Layer Protection *signed, but not ratified:* none of the selected agreements		*NA*		*NA*	*NA*	*NA*			*NA*	*NA*							-	-
Seychelles	Water supply depends on catchments to collect rain water	*party to:* Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Whaling *signed, but not ratified:* Climate Change-Kyoto Protocol	*Y*																-	-

Endnotes

(1) Source: Central Intelligence Agency, World Fact Book, 1999; IUCN Environmental Synopses, 1993.

(2) Source: Central Intelligence Agency, World Fact Book, 1999.

(3) National Environmental Action Plan-Abbreviations DP: Development Phase IP: Implementation Phase FA: Formal Adoption.

(4) Biodiversity Index, M: mammals; B: birds; P: plants; numbers represent: total number of known species; endemic species; and threatened species, respectively.
Source: World Conservation Monitoring Centre, World Conservation Union, and WRI (1998).

(5) Percentage of total land area protected according to IUCN categories I-V, the totals consist of an aggregation of single sites, it is likely that some sites are not contiguous blocks.

(6) Projected number of urban populations for the year 2000; Source: United Nations Population Division, WRI World Resources 1998-1999.

(7) Country Strategic Plan Period, Source: FRAME web site; AFR/SD.

(8) Source: World Conservation Monitoring Centre, World Conservation Union, and WRI (1998).

Table 5: Environmental Profiles of Selected REDSO/ESA Client Countries

Country	Key Environmental Threats (1)	International Agreements (2)	NEAP (3)			Biodiversity Index (4)			Original Forest as % of Land Area (8)	1996 % Forest Cover (8)	% PA (5)	% Urban (6)	SO (from FY 99 R4s) receiving environment sector funds	Funding (in U.S. 000,000) (9)					CSP (7)	
			DP	IP	FA	M	B	P						FY 96	FY 97	FY 98	FY 99	FY 00	FAA	Date
[1] The top figure (in bold) indicates total environmental allocation (this number was not available for all countries) followed by the amount of environment money allocated to the listed SO and the amount of other money funding the SO. Information provided by Tim Resch (AFR/SD). FY 00 figures are request levels																				

Table 6: Africa-Wide Environmental Information from Various Sources

	World Bank Africa Report											CIA World Fact Book, 1999				
				Land Use (000 hectares)								Land Use (percent)				
				Cropland		Permanent pasture		Forest and Woodland		Other Land		Arable Land	Permanent crops	Permanent Pasture	Forests & Woodlands	Other
				percentage *change* since		percentage *change* since		percentage *change* since		percentage *change* since						
Country	Land area (000 hectares)	Population density (per 1000 hectares) 1996	Domesticated land as a % of land area 1994	1992-94	1982-84	1992-94	1982-84	1992-94	1982-84	1992-94	1982-84	percent of land 1999	percent of land 1999	percent of land 1999	percent of land 1999	percent of land 1993E
																Sub-Saharan Africa
Angola	124,670	90	46	3,500	3	54,000	0	23,000	-1	44,170	0	3	0	13	2	82
Benin	11,062	503	21	1,880	4	442	0	3,400	-11	5,340	7	13	4	4	31	48
Botswana	56,673	26	46	420	5	25,600	0	26,500	0	4,153	-1	1	0	46	47	6
Burkina Faso	27,360	394	34	3,465	18	6,000	0	13,800	0	4,082	-12	13	0	22	50	15
Burundi	2,568	2,423	86	1,120	-5	1,080	9	325	0	43	-41	44	9	36	3	8
Cameroon	46,540	291	19	7,040	1	2,000	0	35,900	0	1,600	-5	13	2	4	78	3
Cape Verde												11	0	6	0	83
Central African Republic	62,298	54	8	2,020	3	3,000	0	46,700	0	10,578	-1	3	0	5	75	17
Chad	125,920	52	38	3,256	3	45,000	0	32,400	0	45,264	0	3	0	36	26	35
Comoros												35	10	7	18	30
Congo, Dem. Rep. Of	34,150	78	30	170	10	10,000	0	19,900	0	4,080	0	3	0	7	77	13
Congo, Rep. Of	226,705	206	10	7,900	3	15,000	0	166,000	0	37,805	-1	0	0	29	62	9
Cote d'Ivoire	31,800	441	54	4,031	23	13,000	0	9,600	-6	5,149	-3	8	4	41	22	25
Djibouti												N/A	N/A	9	0	91
Equatorial guinea	2,805	146	12	230	0	104	0	1,830	0	641	0	5	4	4	46	41
Eritrea	10,000	328	75	366		4,622		523		1,155		12	1	48	20	19
Ethiopia	100,000	582	31	12,197		28,267		13,633		49,269		12	0	40	25	23
Gabon	25,767	43	20	460	2	4,700	0	19,900	0	707	11	1	1	18	77	3
Gambia, The	1,000	1,141	37	165	-11	194	2	94	-6	547	4	18	0	9	28	45
Ghana	22,754	784	57	4,407	15	8,400	0	9,300	-3	647	-30	12	7	22	35	24
Guinea	24,572	306	47	787	10	10,700	0	6,700	0	6,385	-1	2	0	22	59	17
Guinea-Bissau	2,812	388	50	340	10	1,080	0	1,070	0	322	-9	11	1	38	38	12
Kenya	56,914	488	45	4,520	6	21,300	0	16,600	0	14,924	-2	7	1	37	30	25
Lesotho	3,035	685	76	320	11	2,000	0			715	-4	11	N/A	66	N/A	23
Liberia	9,632	233	25	371	0	2,000	0	4,600	0	2,661	0	1	3	59	18	19
Madagascar	58,154	264	47	3,105	3	24,000	0	23,200	0	7,849	-1	4	1	41	40	14
Malawi	9,408	1,046	38	1,700	20	1,840	0	3,700	-1	2,168	-10	18	0	20	39	23
Mali	122,019	91	27	2,569	25	30,000	0	11,800	-2	77,650	0	2	0	25	6	67
Mauritania	102,522	23	38	208	7	39,250	0	4,410	-2	58,654	0	0	0	38	4	58
Mauritius	203	5,562	56	106	-1	7	0	44	-24	46	48	49	3	3	22	23
Mozambique	78,409	227	60	3,180	3	44,000	0	17,300	0	13,929	-1	4	0	56	18	22
Namibia	82,329	19	47	704	7	38,000	0	12,500	0	31,125	0	1	0	46	22	31
Niger	126,670	75	12	4,035	14	10,440	13	2,500	0	109,695	-2	3	0	7	2	88
Nigeria	91,077	1,263	80	32,579	6	40,000	6	14,300	-11	4,198	-4	33	3	44	12	8
Rwanda	2,467	2,188	75	1,150	5	695	5	250	0	372	-13	35	13	18	22	12
Sao Tome & Principe												2	36	1	N/A	61
Senegal	19,253	443	42	2,355	0	5,700	0	7,467	-2	3,731	4	12	0	16	54	18
Seychelles												2	13	N/A	11	74
Sierra Leone	7,162	600	38	540	4	2,201	4	1,947	3	2,474	-3	7	1	31	28	33
Somalia	62,734	157	70	1,026	1	43,000	1	16,000	7	2,708	-27	2	0	69	26	3
South Africa	122,104	347	79	15,200	15	81,433	15	8,200	0	17,271	-11	10	1	67	7	15
Sudan	237,600	115	52	12,975	3	110,000	3	42,367	-2	72,258	-14	5	0	46	19	30
Swaziland	1,720	512	73	191	24	1,070	24	119	17	340	1	11	0	62	7	20
Tanzania	88,359	349	44	3,660	24	35,000	24	33,067	-2	16,632	0	3	1	40	38	18
Togo	5,439	772	48	2,420	3	200	3	900	-12	1,919	3	38	7	4	17	34
Uganda	19,965	1,015	43	6,780	9	1,800	9	6,300	5	5,085	-15	25	9	9	28	29
Zambia	74,339	111	47	5,273	2	30,000	2	32,000	7	7,066	-23	7	0	40	39	14
Zimbabwe	38,685	296	52	2,876	3	17,190	3	8,800	-7	9,819	6	7	0	13	23	57
North Africa																
Algeria	238,174	121	17	8,088	9	31,024	9	3,949	-10	195,197	0	2	0	23	43	32
Egypt	99,545	636	3	3,137	27		27	34	10	96,374	-1	2	0	0	0	98
Libya	175,954	32	9	2,170	3	13,300	3	840	33	159,644	0	1	0	8	0	91
Morocco	44,630	605	68	9,686	14	20,933	14	8,613	10	5,397	-29	21	1	47	20	11
Tunisa	15,536	589	51	4,882	0	3,416	0	666	17	6,602	-2	19	13	20	4	44
All Africa	2,963,468	249	36	189,803	7	889,350	7	713,405	0	1,171,024	-1					

World Bank Africa Report					World Bank World Development Indicators						Energy Information Administration							
	Electric power Consumption per capita		Net ODA from all donors, nominal		Carbon Dioxide Emissions													
	Annual average kwh		annual average millions of USD		Total Million Metric Tons		Per Capita Metric Tons		kg per 1995$ of GDP		Sectoral Share of Carbon Emissions (percent) Industrial	Transportation	Residential		Fuel Share of CO2 Emissions (percent) natural gas	oil	coal	nuclear
Country	1985-89	1990-MR	1985-89	1990-MR	1980	1996	1980	1996	1980	1996	1996E	1996E	1996E	1996E	1997E	1997E	1997E	1997E
Sub-Saharan Africa	452	441	11,868	17,302	351	472	1	1	2	2								
Angola	67	63	138	372	5	5	1	1		1	34	42	24		68	33	0	
Benin	48	44	158	276	1	1	0	0	0	0								
Botswana			133	113	1	2	1	1	1	0								
Burkina Faso			264	430	0	1	0	0	0	0								
Burundi			188	266	0	0	0	0	0	0								
Cameroon	240	210	261	545	4	4	0	0	1	0	17	60	23			100	0	
Cape Verde			89	116														
Central African Republic			163	183	0	0	0	0	0	0								
Chad			214	259	0	0	0	0	0	0								
Comoros			49	48														
Congo, Dem. Rep. Of	136	135	537	247	4	2	0	0	0	0								
Congo, Rep. Of	199	221	101	215	0	5	0	2	0	2	14	69	18		75	25		
Cote d'Ivoire	177	168	271	946	5	13	1	1	1	1	35	48	8	10	13	87		
Dijbouti			94	126														
Equatorial guinea			39	48														
Eritrea			0	76														
Ethiopia	18	21	736	1,029	2	3	0	0	0	1								
Gabon	942	765	92	129	5	4	7	3	1	1	40	44	13	3	52	48		
Gambia, The			88	80	0	0	0	0	1	1								
Ghana	293	343	453	647	2	4	0	0	1	1	21	63	14	2		100	0	
Guinea			226	373	1	1	0	0		0								
Guinea-Bissau			92	131	0	0	0	0	1	1								
Kenya	106	120	667	846	6	7	0	0	1	1								
Lesotho			107	128														
Liberia			78	129														
Madagascar			295	363	2	1	0	0	1	0								
Malawi			279	501	1	1	0	0	1	1								
Mali			398	463	0	1	0	0	0	0								
Mauritania			214	252	1	3	0	1	1	3								
Mauritius			52	41	1	2	1	2	0	0								
Mozambique	50	51	625	1,141	3	1	0	0	2	1								
Namibia			24	160														
Niger			333	343	1	1	0	0	0	1								
Nigeria	85	86	125	235	68	83	1	1	3	3	33	48	16	4	58	42	0	
Rwanda			222	496	0	1	0	0	0	0								
Sao Tome and Principe			22	56														
Senegal	101	99	569	648	3	3	1	0	1	1								
Seychelles			23	20														
Sierra Leone			85	170	1	0	0	0	1	1								
Somalia			462	435														
South Africa	3,653	3,769	0	188	211	293	8	7	2	2	58	29	9	4				
Sudan	47	40	936	513	3	4	0	0	1	0	33	48	16	3		100		
Swaziland			34	51														
Tanzania	42	55	797	1,042	2	2	0	0		1								
Togo			162	181	1	1	0	0	1	1								
Uganda			304	706	1	1	0	0	0	0								
Zambia	808	591	411	948	4	2	1	0	1	1								
Zimbabwe	939	838	259	494	10	18	1	2	2	2								
North Africa	601	749	2,572	4,753														
Algeria	400	484	177	343	66	94	4	3	2	2	45	29	26		65	32	3	
Egypt	606	823	1,640	3,342	45	98	1	2	2	2	58	23	19		25	71	4	
Libya	3,639	3,638	9	12	27	41	9	8			41	54	6		34	66	0	
Morocco	299	377	494	817	16	28	1	1	1	1	36	38	21	5	0	75	25	
Tunisa	459	593	252	239	9	16	2	2	1	1								
All Africa	486	511	14,440	22,056														