

DISCUSSION PAPER

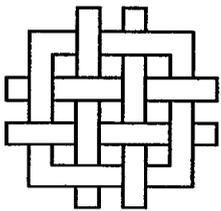
**Critical Links:
Food Security and the Environment
in The Greater Horn of Africa**

by

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A Background Paper for a Stakeholder Analysis and Dialogue on
Food Security and the Environment in the Greater Horn of Africa
by the World Resources Institute
and the World Conservation Union (IUCN) - East Africa Office



World Resources Institute

PREFACE AND ACKNOWLEDGMENTS

This draft document is intended to serve as a background discussion paper for a project on "Food Security and the Environment in the Greater Horn of Africa: Stakeholder Analysis and Dialogue," being undertaken in FY 1996-97, by the World Resources Institute (WRI) and the International Union for Conservation of Nature- East Africa Regional Office (IUCN-EARO), in collaboration with other organizations in the region. The project is being supported by the USAID Regional East Africa Office (Natural Resources Division), as part of WRI's cooperative agreement with USAID (Global Bureau and Africa Bureau).

The project highlights a participatory "Stakeholder Workshop and Dialogue" on food security and the environment in GHA, to be held in Nairobi in mid-1997, in which representatives from multiple sectors and organizations will participate. This paper, and several others on country-level concerns, are being prepared for this project. We hope that this discussion paper on "Critical Links" offers some useful ideas to be considered at the workshop. It summarizes the nature of the crises in the GHA, and offers constructive ideas and strategic principles for discussion on how to integrate critical environmental concerns to help assure food security and conflict resolution in the region. The paper is based on an extensive review of literature, and experience in the region. We also hope that this can be useful to organizations and individuals in GHA who are setting priorities and establishing strategic actions to resolve the crises. For further country-level information, we suggest that readers also refer to other national papers that are being prepared by IUCN and collaborators as part of this project. (Also, see reference list and Appendix for further information.)

I wish to thank Nabiha Megateli, research consultant for this project, for her valuable and comprehensive review and analysis of literature, compilation of information, intellectual contribution, and support. I am grateful to my program assistant, Roberto Colque, for assistance on graphics and references, Christina Reinhard, for literature review and comments, and Sara Moola, for preparing maps. I am also thankful to WRI colleagues, Thomas Fox, Peter Veit, Christine Elias, Jake Brunner, Arthur Getz, and Deanna Madvin Wolfire, for their input, comments, and advice, and Maria Delgado for assistance on graphics. Also appreciated are the reviews and suggestions of IUCN-EARO colleagues, and of Dennis McCarthy, Joao Queiroz, Charlotte Bingham, John Mugabe, Steven Hansch, Sam Mwale, Nuri Kadir, Charles Teller, Thomas Catterson, Simon Maxwell, and Walter Knausenberger, and George Abalu. Also greatly appreciated is the support of USAID-REDSO, the continuing interest and support of USAID Global and Africa Bureaus, and collaboration of the UNECA program on Food Security and Sustainable Development.

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CRITICAL LINKS: FOOD SECURITY AND THE ENVIRONMENT IN THE GREATER HORN OF AFRICA

by L. Ann Thrupp with N. Megateli

INTRODUCTION AND SUMMARY

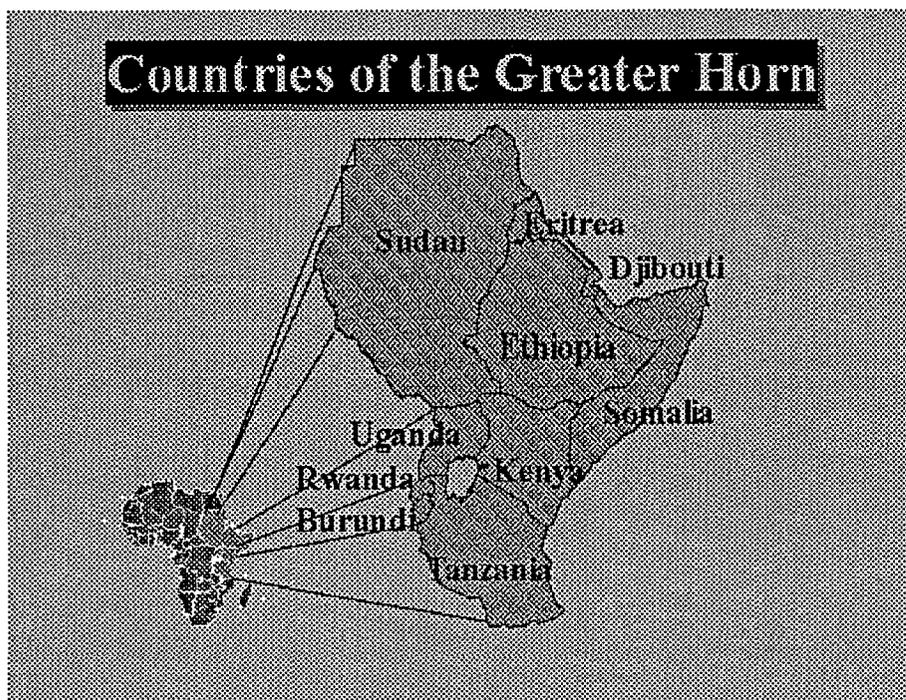
Overcoming hunger remains one of the most daunting and important challenges facing humanity. The threat of starvation looms most seriously over Africa, where an estimated 33% of the population, some 138 million people, largely children and women, suffer from hunger (IFPRI, 1995, USAID/State, 1994). Moreover, per capita food production in Africa has steadily declined by 23% over the last 25 years (FAO, 1995). Within this continent, the Greater Horn of Africa (GHA) region bears particularly debilitating and widespread effects of hunger and famine. (See Map 1.) In this region, consisting of Sudan, Ethiopia, Eritrea, Djibouti, Somalia, Uganda, Rwanda, Burundi, Tanzania, an average of 71 million people or 46% of the population are chronically food insecure, according to 1989 estimates (USAID/State, 1994). Few conditions evoke more public concern than famine; the tragic plight of hungry people, especially those in war-ravaged nations, demands concerted attention by multiple institutions and governments both inside and outside the GHA.

Moreover, the people of GHA also suffer from continual conflict, entrenched poverty, and environmental deterioration -- including land degradation, soil erosion, desertification, fuelwood scarcity, biodiversity loss and human-induced droughts. Such problems have, in turn, compounded difficulties in producing sufficient food, trapping people in a vicious downward cycle of insecurity. Such ecological stresses, along with inequities in the distribution of resources, have also led to social upheaval (migration, displacement), and caused and aggravated conflicts in the region.

In response, governments, development agencies, relief services, international organizations, as well as community groups, have attempted to relieve the crises through food aid and other emergency programs. Such programs have been significant responses to emergencies. But many of these attempts have not been successful in generating lasting solutions; they have often been short-term measures that do not address the roots of problems. Regionally-coordinated actions and policy changes are urgently needed to ensure more sustainable solutions.

To address this challenge, an important general strategy is to integrate environmental concerns into efforts to achieve food security (Reardon and Shaikh, 1995, Pretty et al, 1996, Hutchinson et al, 1991, IDS, 1994, Westing, 1991, Barraclough, 1996). In other words, environmental security and food security are closely linked, and must be addressed simultaneously. *It is essential to realize that food production is largely dependent on the conditions of the resource base.* Likewise, sound resource management -- particularly the use of sustainable agricultural practices -- is needed for food production, secure access to food, and for hunger alleviation. It can also reduce environmental stress and related social conflicts. Moreover, making an effective link between environment and food security involves the integration of social security -- consisting of political security, economic security, and social equity/justice. A secure food system should provide equitable, as well as reliable, access to food for a healthy life by all people at all times (Barraclough, 1996).

MAP 1



This paper provides a synthesis of major challenges and opportunities in the food security-environmental nexus. Drawing upon a wide range of studies and knowledge in this field, this paper is intended to help clarify the key linkages, the underlying causes of food insecurity and environmental degradation, and to suggest key opportunities and options -- to overcome the complex, entrenched problems in GHA. A summary of the key resource endowments, critical issues, and causes of problems are summarized in Table A.

Table A: Summary of Endowments, Problems and their Causes, and Types of Stakeholders in the GHA

Resource Endowments	Linked Food & Environment Problems (regional)	Underlying Causes of Problems	Types of Stakeholders in GHA
Human resources 186 million people Diversity of ethnic groups Transboundary resources Large Rivers & Lakes Watersheds Wetlands & swamplands Coastal/marine resources Fisheries Grazing pastures Agricultural Biodiversity Plant genetic resources Livestock diversity, etc. Energy resources and mines Variation in biophysical features	Food Insecurity Famines & food emergencies Food Production Decline Nutrition & Health problems Socioeconomic decline Crises for refugees Displacement of people Natural Resource Degradation Soil degradation Biodiversity loss Watershed degradation Critical Resource areas Natural constraints Coastal resource degradation Fisheries depletion Environmental refugees	Economic Policies/Programs Market, credit, price policies Biased agricultural schemes Inequitable resource distribution Disparities in resource access Income/land concentration Political conflicts & instability Wars and militarization Resource Conflicts Corruption & lack democracy Tenure insecurity and constraints Disruptcustomary tenure Institutional Weakness Lack of coordination Demographic pressures Weak Environmental Policies	Internat'l Agencies Bilateral Agencies Regional Institutions IGAD, UNECA, FEWS, and others National Govt Instittns Agric. Ministries Envir. Ministries Economic ministries Planning agencies Non-govt. Organizatns International NGOs Local NGOS Relief/church groups Producers (farmers, pastoralists, fishers) Communities

The analysis concludes with the key strategic principles that are needed to reverse the downward spiral of hunger, resource degradation, poverty and conflict. It gives special attention to the need for developing *regional collaborative approaches* among stakeholders. It focuses on *critical transboundary resources*, meaning resources that are shared commonly across national boundaries, such as watersheds and lake regions, pastoral lands, agrobiodiversity; and regions of refugee concentrations, extreme degradation and political conflict. It also shows the need to address the causes of problems. Give special attention to vulnerable groups, such as refugees, women, and children, and displaced pastoralists, and risk-prone regions, which are subject to more serious impacts and suffering. These and other strategic principles, along with critical actions to achieve food-environmental security, are summarized in Box A. It is hoped that these findings and suggestions are useful for achieving region-wide food security and environmental security, which can also work towards sustainable and peaceful development.

**Box A: Summary of Strategic Principles and Priority Regional Options
for Food and Environmental Security in the Greater Horn of Africa**

Strategic Principles

- i. Regional Cooperation among stakeholders
- ii. Focus on key transboundary (shared) issues, particularly critical resource areas
- iii. Confront the roots of the interlinked food and environmental insecurities
- iv. Participation and empowerment in Food/Environmental Security Initiatives
- v. Enhancing Diversity of Economic, Ecological and Social Conditions
- vi. Mobilize and strengthen initiatives and resources for Food-Environment Security
- vii. Uphold and Build upon International Conventions on Food Security and Biodiversity

Key Types of Options and Actions for Regional Action:

1. Policy reforms (i.e., market & structural adjustment & trade policies, participatory approaches)
2. Sustainable Agriculture methods, stressing diversity and agroecological principles
3. Institutional and governmental changes and capacity-building
4. Distributional reforms and equitable opportunities
5. Regional Conflict resolution and Governance Reforms
6. Demographic Changes, through support to education/health services
7. Research and Information challenges

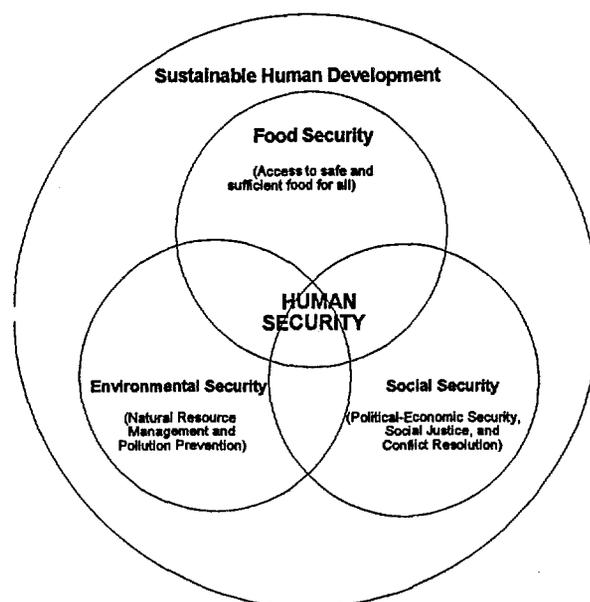
I. FOOD SECURITY AND THE ENVIRONMENT: CONCEPTS, CONNECTIONS, AND A FRAMEWORK FOR UNDERSTANDING

The integration between food, environment, and social security can lead to valuable “win-win” opportunities for effective and lasting solutions to complex development problems. This section provides a brief overview of key issues, as an introduction to the GHA situation.

A. A Framework and Key Concepts

Food security, environmental security, and social security are inextricably linked, and equally important. They are vital for livelihood and for sustainable socioeconomic development. (See Fig 1).

Figure 1: Linkages between Food Security, Environmental Security and Social Security in a Sustainable Development Framework



L.A. Thrupp

Although food security is defined in various ways, there is general agreement on the general significance. According to the World Food Summit, *food security means that “all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”* (FAO, 1996) More simply, “food security means access to food for a healthy life by all people at all times” (Barraclough, 1996).

Food security is considered a basic *human right* vital to survival (FAO 1996b, UNHCR, 1996). This also refers to the right to safe food and information about the content of food eaten (AGORA et. al., 1995). Food security therefore means more than the total production of a sufficient volume of food in a given country or region; rather it means peoples’ entitlement to available nutritious and safe food

over time-- implying adequate distribution of food or purchasing power to obtain it (FAO, 1996b, Sen, 1981/93/96, Pretty et. al., 1996 (Eicher and Statz, 1996, p. 261)). Food security is a part of livelihood security at individual, household, community and national levels, for all people (Chambers 1988, Davies & Leach 1991, Maxwell 1991).

Box 1. Important Conditions for Secure Food Systems

A range of definitions suggest at least six key conditions for secure food systems:

- Reliable capacity of communities, nations, regions to produce and store food;
- Equity in access to food and to productive resources for all individuals and groups, as determined by entitlement, i.e. the ability to buy, exchange or acquire food and gain access to or control of productive resources;
- Sufficiency (in food quantity) or ability to cope with insufficiency;
- Nutritional security at the household level, that is adequate protein, energy, micro-nutrients, and safe food for all household members, including women, men and children;
- Socially and environmentally sustainable food production and distribution over time;
- Low risk and vulnerability to economic and ecological fluctuations.

(Adapted from Barraclough, 1996, FAO, 1996, Maxwell 1991, Maxwell and Freudenberger, 1993)

The achievement of food security is an ideal social goal, since such conditions are seriously lacking in many parts of the world, and particularly in the Greater Horn of Africa. Food *insecurity* -- the opposite, is pervasive in the GHA. It is manifested as chronic hunger, malnutrition, and as famine when extended over long periods. Food insecurity is a failure of peoples' entitlement or access to food (IFPRI, 1995, Sen, 1981, 1993, 1996). It is particularly severe in war-ravaged or degraded areas in the GHA, where large groups of displaced and poor people suffer from chronic hunger.

Environmental security has been defined generally as "a state in which an ecosystem is able to support the healthy pursuit of livelihoods by the people living in that system" (OECD, 1996). It refers to the rational and sustainable use of natural resources, safe disposal of wastes, as well as protection from pollution and abuse, and conservation of biological diversity (Westing, 1991). Regional environmental security is particularly important as a goal in the GHA context, to ensure cooperation to sustainably use, share, and conserve resources (Ejigu, 1995, Westing, 1991, OECD, 1996). Environmental *insecurity* logically means the opposite of the concept just defined; and it is also pervasive in the GHA. Some environmental conditions are "naturally" insecure, due to innate biophysical characteristics (such as inherently acidic soils). Many others are insecure as a result of human activity, such as overexploitation of soils (OECD, 1996). Often natural and human-induced causes interact, for example, when natural flooding is exacerbated by deforestation in watersheds (Blaikie and Brookfield 1987).

Social security refers to a combination of economic, political, personal security, and social equity (Westing, 1991). This encompasses assured access to basic livelihood needs, as well as respect of human rights and protection from abuse and conflict (Engo 1993). Achieving such comprehensive social security is also a goal for the GHA, since social *insecurity* -- including inequities in the control of resources, lack of legal rights, political instability, and conflicts -- are prevalent. (See Part 3.)

B. Critical Linkages

Food, environmental, and social conditions are inseparable. Food production and the livelihoods of people *depend up on the natural resource base*. (See Figures 2 and 3) It follows that environmental degradation, food insecurity, and socioeconomic decline are interrelated in a vicious cycle. Overexploitation, pollution, and depletion of resources undermine productive capacities; this leads to declining yields in agriculture and fisheries, and to high socioeconomic costs. Such conditions, in turn, contribute to food insecurity and hardship, which then fuel political conflict (Reardon and Shaikh, 1995, Hutchinson et al, 1991, Uvin 1996, Westing, 1991, UNHCR, 1996, Matthews, 1989, cited in Campbell/CIDA, 1996).

At the same time, political instability, conflict and oppression, and other forms of social insecurity, can lead to hunger. Food insecurity often leads poor people to exploit and degrade resources in attempts to survive, which leads to environmental damages. Thus, “the forces of famine, resource degradation, and conflict operate in mutual reinforcement” (Unruh, 1995) -- trapping communities, and nations in a downward spiral (Barraclough, 1996, Blaikie & Brookfield, 1987, Blaikie, 1985, Hutchinson et al, 1991, Reardon and Shaikh, 1995, Unruh, 1995, Veit et al, 1995, UNCHR, 1996).

Hunger and environmental degradation are also linked in that they are both *symptoms* of deeper underlying causes -- including unsustainable and inequitable patterns of development, political and ethnic conflicts, poverty, inadequate tenure systems, inappropriate policies, and demographic pressures (Percival & Homer-Dixon, 1995, Barraclough, 1996, Blaikie, 1985). Although many programs have been carried out as attempts to alleviate problems, they are often ineffective and have even aggravated insecurities. The specific causes in the GHA context will be identified in Part 3.

FIGURE 2:

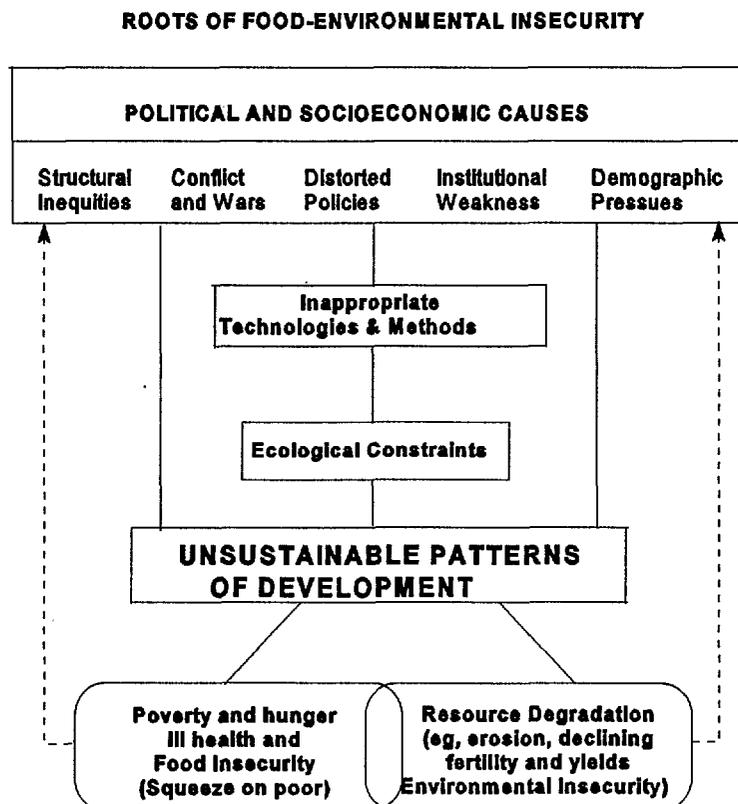
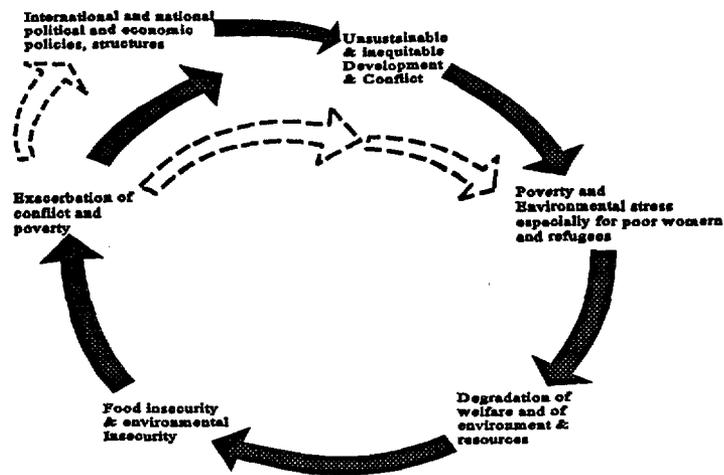
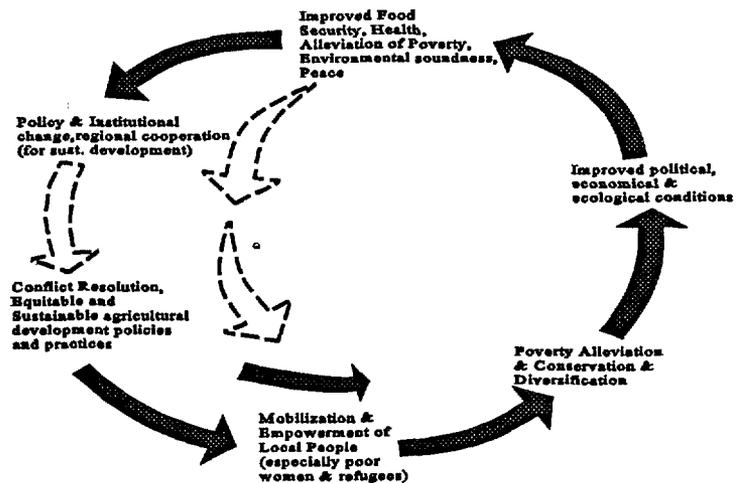


FIGURE 3A: Vicious Cycle of Food, Environment and Social Insecurity**Figure 3B: Positive Cycle of Food, Environment, and Social Security**

In contrast, however, there are also positive linkages. Food security, environmental security, and social security work hand-in-hand, in an upward cycle. That is, improving environmental security contributes to improved productivity and food security, which help improve social security and can alleviate conflict (Pretty, 1996, Thrupp, 1996). Also, improving food security leads to environmental security. These factors are so closely related that it is difficult to identify the cause-effect relation, and should be addressed simultaneously (Reardon and Shaikh, 1995, Hutchinson et. al., 1991, McNeely, 1993, Uvin, 1996, Westing, 1991, Olsson, 1993.) Building these positive linkages is an important challenge in GHA, particularly at the regional level; and achieving such changes for both food and environmental security implies a need for cooperation regionally.

II. THE GHA CONTEXT: RESOURCES, SOCIETY, AND STAKEHOLDERS

The Greater Horn of Africa region is comprised of ten countries -- Eritrea, Ethiopia, Sudan, Djibouti, Somalia, Kenya, Uganda, Rwanda, Burundi, and Tanzania -- in Eastern Africa. (See Map 1.) Although these countries have a wide range of physical and cultural features, they share some geographical and environmental similarities. More significantly, they all have suffered serious crises -- widespread hunger and famines, violent conflict, environmental devastation, and severe poverty -- over the past two decades, summarized in Part III. Many of these conditions are *transboundary* concerns, since they span political boundaries, affecting multiple nations and ethnic groups. As such, they pose major challenges and opportunities for *regional cooperation* among the GHA stakeholders.

A. Resource Endowments and Shared Transboundary Resources

1. General features and the rural resource base

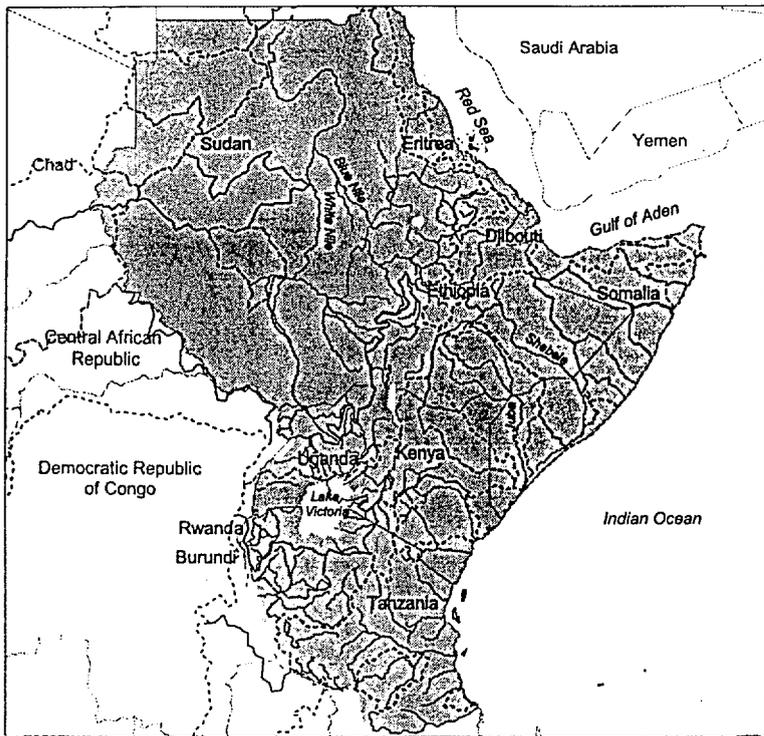
The GHA countries have several common geographical features. A large majority of the land area in the Horn is highly arid, with expansive plains and deserts. Many of the countries also have mountainous areas with good average rainfall. The majority also share oceanic coastlines and watersheds; only Uganda, Rwanda, and Burundi do not have coastal resources. Soil types vary: while soils in many areas are either inherently acidic and poor for farming or are degraded (as discussed in Part III), some soils have high agricultural potential, as in the Rift Valley, and are well-suited for production if the land is well-managed (Hutchinson et al, 1991). (See Maps 2,3,4,5)

Approximately 186 million people live in the GHA region (USAID/State, 1994). There is a remarkable number and diversity of ethnic groups. In the Horn of Africa alone, for examples, there are four linguistic families and more than 90 ethnic groups (Hutchinson et. al., 1991). A large majority of the population is rural, and annual population growth is high --around 3% (Cleaver and Schreiber, 1994). Population density varies greatly in the GHA region. In many areas, the population density is very high and in more arid regions, population density tends to be very sparse.

The region's economies are largely based on agriculture and livestock production. A large percentage of the labor force (over 70%) is in agriculture in each country (WRI, 1994). Both women and men contribute to food production in the region (Quisumbing et al, 1995). The main food crops are maize, sorghum, millet, barley, tef, wheat, beans, pulses, cassava, rice, plantains, sugarcane, sesame, groundnuts and oilseeds (FAO, 1996b). Pastoralism has an important role in several GHA countries; in Somalia, for example, 50% of the population are pastoralists (IUCN/Somalia, 1997). Traditionally, pastoralists have been well-adjusted, productive, and effective caretakers of resources, using mobility to cope with the harsh arid conditions (Homewood and Rodgers, 1992, Hutchinson et al, 1991, Jodha, 1990, Koller-Rollfsen, 1993, Lane and Pretty, 1990, McNeely et al, 1995, Scoones, 1992).

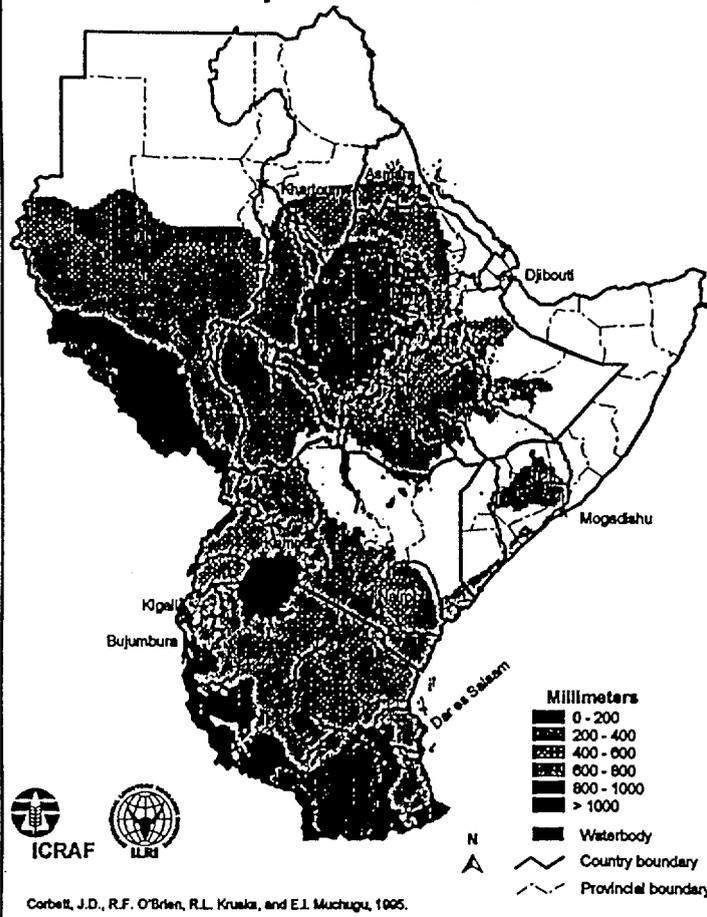
Several of the GHA countries export agricultural products, mainly coffee, tea, cotton, meat and leather, and also some food crops (Cleaver and Schreiber, 1994, WRI, 1994). Agricultural export earnings have enabled the countries to purchase food imports and other goods. In recent years, the GHA countries have tended to increase the land area for export-oriented agriculture. Ethiopia, for example, has increased its grain exports, despite serious internal food deficits. In 1996 alone,

Map 2: Rivers, Watersheds and Lakes in the Greater Horn of Africa.



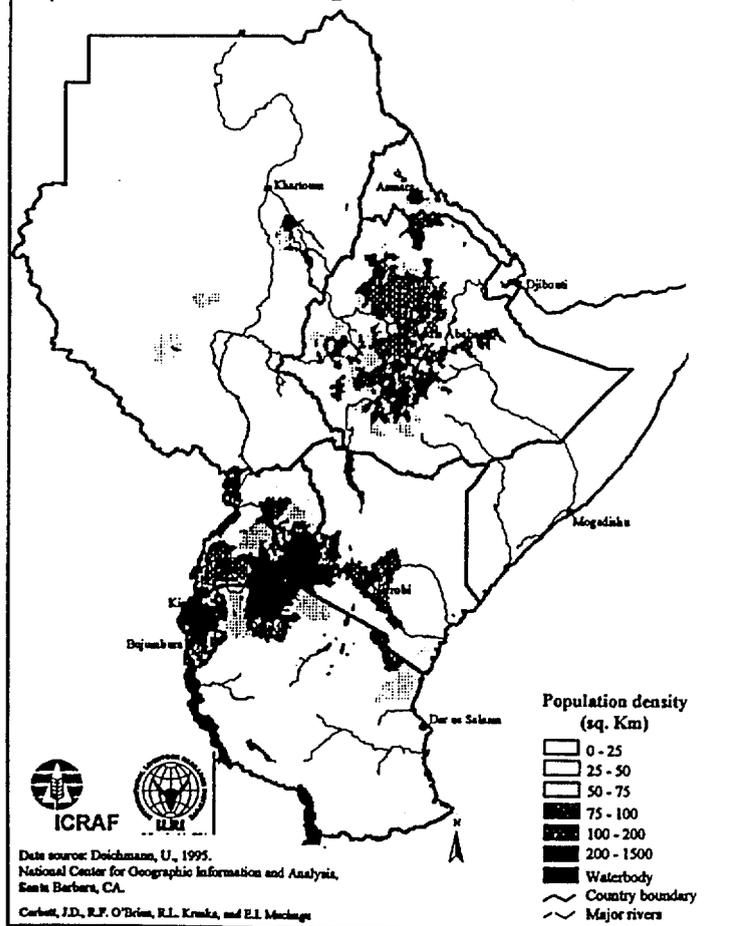
Sources: Watersheds from ETOPO5 (Army Corps of Engineers, CERL, 1988), Rivers, Lakes and Political Boundaries from Digital Chart of the World (1993).

Map 3 Total Precipitation – Five Months Optimum Season



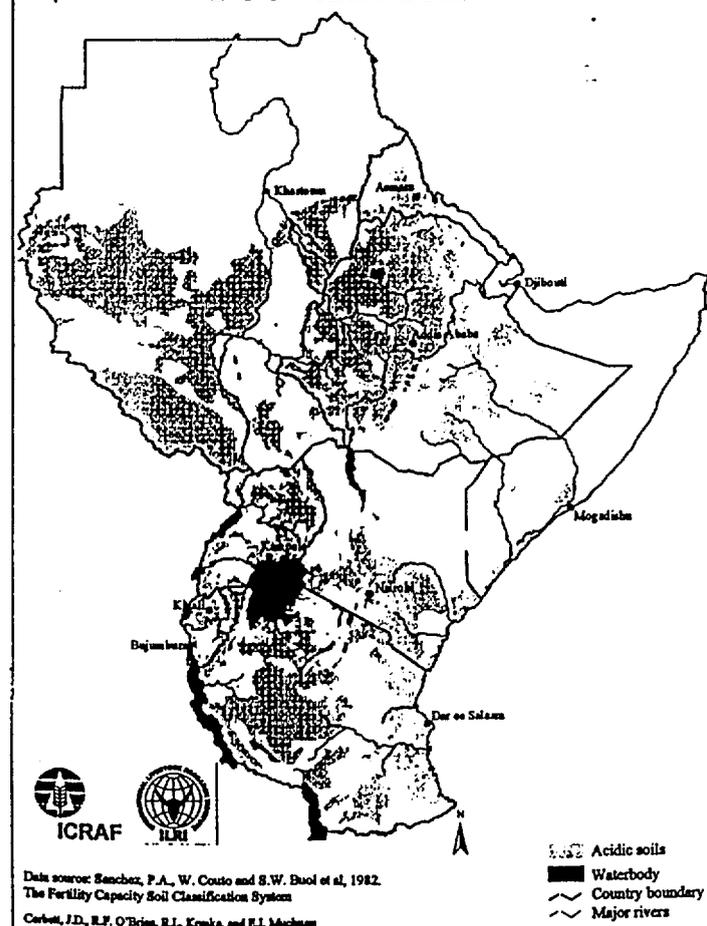
Corbett, J.D., R.F. O'Brien, R.L. Kraska, and E.I. Muchugu, 1995.

Map 4 Human Population Density



Date source: Deichmann, U., 1995. National Center for Geographic Information and Analysis, Santa Barbara, CA.
Corbett, J.D., R.F. O'Brien, R.L. Kraska, and E.I. Muchugu

Map 5 FCC - Acid Soils



Date source: Sanchez, P.A., W. Couto and S.W. Buol et al, 1982. The Fertility Capacity Soil Classification System
Corbett, J.D., R.F. O'Brien, R.L. Kraska, and E.I. Muchugu

Ethiopia exported thousands of tons of wheat to Kenya (Masefield, 1997, Kedir, 1997). This trend is largely due to structural adjustment and trade promotion policies promoted by international financial institutions. Although the growth in export agriculture has benefitted the enterprises involved, this export orientation poses dilemmas for the GHA nations, because income from food exports often does not “trickle down” to benefit the hungry.

2. Valuable Transboundary Resources for Food and Environmental Security: Watersheds, Agroecosystems & Pasture lands, Coastal & Marine, and other Resources

The countries of GHA share many common concerns tied to resources and agriculture. Rivers, watersheds, grazing lands, energy resources, fisheries, forests, protected areas and many other resources cross national boundaries. Such important resources are called “transboundary” resources or ecosystems -- which are both challenges and opportunities in the GHA. Transboundary resources are often a source of conflict and hostile competition (Hutchinson et. al. 1991, Westing 1991). Many of the transboundary resources have been mismanaged, degraded, and sometimes underused. Yet, these resources are valuable shared assets for the region, and tie the GHA together. If carefully and equitably managed regionally, transboundary resources offer potential to alleviate insecurities and achieve more sustainable development (Ejigu, 1995, Westing, 1991).

The seven main river systems and lakes in the region are cradles of important watersheds, groundwater aquifers and riparian ecologies, including a diversity of fish and wildlife --which are key transboundary resources. The main shared river systems, lakes and watersheds are: Lake Victoria (59% Tanzania, 45% Uganda, 6% Kenya), the Omo River in Ethiopia and Lake Turkana (5% Ethiopia, 95% Kenya), lakes shared by Djibouti and Ethiopia; the Baro River in Ethiopia which becomes the Sobat River in Sudan and joins the Blue Nile to feed 75% of the Niles Headwaters in Egypt; the Juba and Shebele Rivers of Somalia, the Awash basin of Ethiopia, and the Barka and Gash Rivers linking the Ethiopian highlands to southeastern Sudan. While these watersheds and lakes are valuable for agriculture, fisheries, and important ecosystems, many of them have been mismanaged, resulting in serious resource degradation, depletion, and food insecurity, as discussed in Part III.

The region’s large areas of wetlands and swamplands are also the source of valuable fisheries and seasonal wetland agricultural and pastoral potential. Transboundary wetlands include the Awash swamplands, the Rift and Blue Nile valleys of Ethiopia, the Sudd and White Nile wetlands and the Mackar and Kenumuku marshes of Sudan, the Jilal Moogi wetlands in Lower Shebele, Somalia, the *miombo dumbo* wetlands and seasonal salt ponds of Kenya and Tanzania, and Lake Tanganyika (40% Tanzania, 8% Burundi, 46%, Democratic Republic of Congo, 6% Zambia).(Scoones, 1991).

In contrast, expansive pasturelands in arid areas are also significant transboundary agroecosystems throughout the region that are valuable for food security. Arid plains and grazing grasslands cross national border lines in nearly all countries of GHA. Pastoral communities and tribes typically move across these lands, regardless of nationality, in the age-old quest to sustain their herds and their livelihoods. The famous Serengeti plains is a classic example. Additional valuable agroecosystems that are shared in several countries are found in highland plateaus and hilly regions that are naturally rain-fed and have fertile (sometimes volcanic) soils, good for coffee, tea, and other crops.

Coastal and marine resources along the Western Indian Ocean coastline, including fisheries, coral reefs, and mangroves, are also important transboundary resources in the GHA. These oceanic and coastal zones harbor a wealth of highly diverse resources, which are biologically and economically important. Commercially and culturally, the natural wealth of the coastal zone in GHA has been used for centuries, benefitting millions of people. Well-developed coral reefs have evolved along major sections of the continental shelf. The coastal zones of the Red Sea have some of the richest coral reefs in the world; and the reefs extend further south, to the Tropic of Capricorn. (Hatzios et al, 1996)

Some 25 million people are estimated to live in the coastal zone between Somalia and Mozambique. This number represents about 20 percent of the combined populations of these nations, living in only 12 percent of the land area (UN, 1992). The main economic activities are fishing and farming of coastal lowlands. Fish is clearly an important source of protein and income for thousands of communities who live in the coastal zone, and for many urban consumers (Hatzios, 1996, USAID/State, 1994). There is a lack of data on total fisheries harvests and consumption, but estimates suggest that the Sudan, for example, has a potential catch of 30,000 tons/year, and Somalia about 179,000 tons/year. A range of fishers -- from artisanal fisherman to large commercial trawlers -- compete for catches. Domestic and artisanal fishers account for about 40% of the total marine catch. (Hatzios, 1996). Shipping and tourism are rapidly growing and have become significant in some coastal areas. The tourism industry is becoming an important source of foreign exchange. Coastal cities, such as Dar es Salaam and Mombasa, are experiencing dramatic growth. Although such changes bring certain economic benefits, they often entail the mismanagement or over-exploitation of coastal and marine resources, as explained in Part III.

Other transboundary resources in GHA include forests, rangelands, and savannas. In such ecosystems, both domestic and wild animals and plants move across boundaries and often provide food sources. Shared grazing lands have often been the sources or places of conflict, due to a variety of political and economic constraints. Particularly important cross-border pastures are the Huud and Ogaden regions between Somalia and Ethiopia, and the Awash and Danakil Valleys of Ethiopia and Eritrea, and the range commons between Kenya, Somalia, Tanzania.

At least half of the region's protected areas cross national borders. For example, three of the well-known shared parks are: Masai Mara-Kenya/Serengeti; Maswa, Ngorongoro/Tanzania; Tsavo-Kenya/Umba and Mkomazi-Tanzania (Ejigu, 1995, Kedir, 1997, Hutchinson et al. 1991, IUCN 1987/1989, Thorshell & Harrison, 1990). The region's substantial mineral resources and energy reserves, including gas and petroleum resources, and geothermal sources in the Rift Valley, also transcend boundaries. They have had minimal exploration, and offer potential for development, if managed rationally (Hutchinson et al, 1991).

All of these shared resources provide advantages for the region as a whole. However, in many of these areas, the resources are being depleted and degraded, and the people suffer from poverty and food insecurity, exacerbated by political and ethnic conflict. If the GHA addresses such problems, to be summarized in Part III, the promising potential of these resources could be realized.

3. Agricultural Biodiversity: Valuable but threatened resources

Agricultural biodiversity refers to the broad variation of genetic resources, plant and animal species (including domesticated and “wild” crops and animals, insects, soil organisms, etc) and agroecosystems. GHA’s agrobiodiversity is valuable for nutrition and livelihood security, and to the region’s ability to achieve food security. (See Box 1 and Figure 4) (Booth & Wickens, 1988, Brookfield and Padoch, 1994, FAO, 1989, Fleuret, 1979, Good, 1989, Gujit et. al. 1995, Hinchliffe et. al., 1996, Kiambe & Opole, 1992, NRC, 1996, Sherfe, 1995, Shigeta 1990, UNDP/GEF, 1994) These dimensions of diversity are very high in certain parts of GHA, especially in Ethiopia, which has been identified as one of the unique centers of plant diversity globally (Worede, 1992, Thrupp, 1997, McNeely et al, 1995). Ethiopia is a primary center of domestication and diversification for some 38 crops. It possesses a rich diversity of genetic resources of oats, pulses, linseed, chickpea, cow pea, niger seed, mustards, sorghum, rape, ensete, tef, coffee and other cereals such as millets, barley, and wheat (McNeely et al, 1995, NRC, 1996, Worede and Mekbib, 1993, UNDP/GEF, 1994). Farmers’ landraces and their wild relatives are valuable for crop improvement (Worede, 1992). (See Box 1).

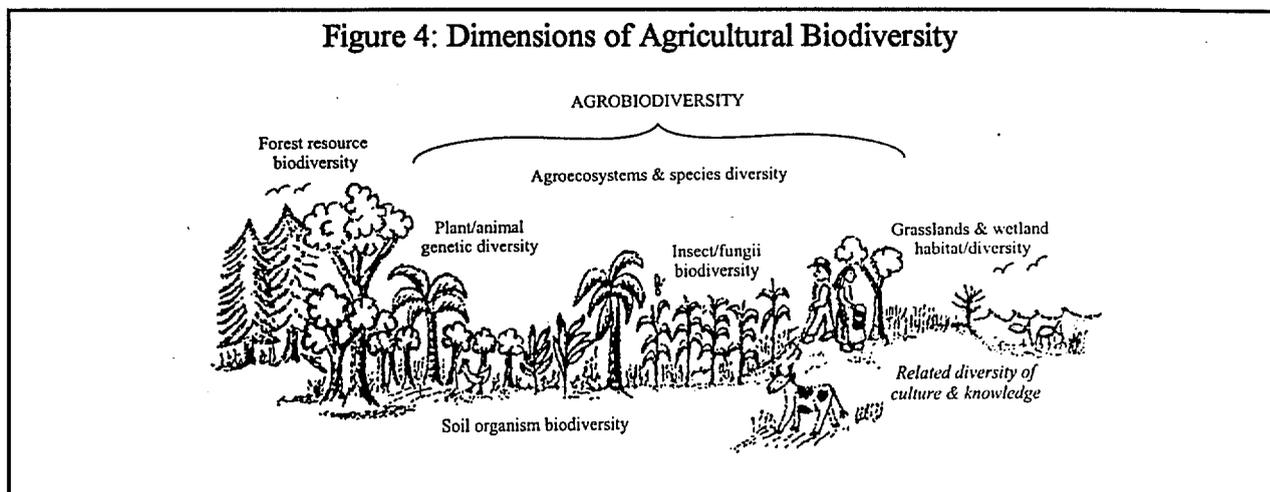
Diverse livestock species and forages are also managed by GHA pastoralists and contribute up to 30-40% of the total value of food and agricultural production (Hanson, 1994, Scherfe, 1995). Domesticated animal diversity in Africa, much of which is concentrated in the GHA, comprises some 15% of world's cattle breeds, 20% of turkey breeds, 10% of the worlds’ goat breeds and 8% of the sheep breeds (Scherfe, 1995). In the GHA, there are over 60 cattle, 18 goat, 15 sheep, 5 dromedary and 6 wild mule varieties (Scherfe, 1995).

BOX 1: Agrobiodiversity Conservation in GHA as a Strategy for Food Security

Many GHA communities have conserved and used agrobiodiversity as an important way to secure food supplies and to cope with harsh conditions. The rural people have maintained a wide variety of food crops and landraces – i.e., “wild” varieties that are domesticated. The GHA is rich in landraces of finger millet (*Eleusine coracana*, remarkable for its long storage life, filling, tasty and nutritious nature), pearl millet (*Pennisetum glaucu*, the world's sixth largest cereal crop known to be very tolerant of heat and drought), sorghum (*Sorghum bicolor*, the quick maturing, versatile, adaptable food plant), the rare emmer wheat (*Triticum dicocum*) and tef (*Eragrostis tef*) esteemed for their taste and high iron and protein contents, Ethiopian native oats and a whole range of undomesticated wild-cereal grains and grasses (NRC, 1996).

In Ethiopia’s northwest Gondar region, for example, farmers plant together 6 or more crops including maize, faba bean, sweet sorghum, cabbage, tomato, potato, pumpkin, and bottle gourd and grow many wheat, finger millet and barley varieties in specific mixtures to cope with drought (McNeely et al 1995). Ari farmers of southern and central Ethiopia have diverse home gardens intercropping of taro, yam, vegetables, medicinal plants and coffee with the perennial false banana, ensete *Ensete verntricosum*. In other parts of Ethiopia, the men and women farmers conserve and manage seeds for crops such as mustards, coffee, tef, barley, etc (Worede & Mekbib, 1993, Mooney, 1992, Bennet-Larley & Akromah, 1996). Recent projects, discussed in Part VI, have attempted to revive and support such local practices which have been eroded over time.

Maintaining this diversity of species and varieties is an important coping strategy, reduces risk, and is a foundation of food security for the people. Traditionally, farmers in the region, including men and women, have effectively managed and enhanced biodiversity in their farming and pastoral systems.



Farmers plant, select, and conserve multiple varieties, using intercropping, crop mixtures and rotations. They typically grow mixtures of plants together, adapting them to changing conditions (Brookfield & Padoch, 1994, McNeely et al, 1995, Rahmato, 1988, Richards, 1985). Where possible, they also plant trees in farms and utilize forest resources for food-related purposes.

The local people have selected and developed new varieties and crops in response to changes or stresses in the environment, threats of disease, and changing socio-economic conditions. In drought prone areas of Ethiopia, for example, grain varieties are grown in complex mixtures to help stabilize yields over time (McNeely et al, 1995). The people have important indigenous knowledge about the region's agrobiodiversity (Shigeta, 1990, McNeely et al, 1995, Richards, 1985, Worede, 1992). Ari farmers, for example know at least 78 folk crop varieties of ensete (false banana), have a complex taxonomy to distinguish landraces, and maintain wild cultivars and their habitats in Ethiopia (Shigeta, 1990). Yet, this valuable diversity and knowledge is being eroded and inadequately supported. These assets could be more effectively used to achieve food security.

B. Stakeholders and institutions involved in food and environmental security

Multiple institutions and people in GHA, including local actors, national, regional, and international agencies, influence and/or work on food security and environmental security issues, using many different approaches and distinct sectors. These are *stakeholders* in the region. For many years, the activities and efforts of these stakeholders have helped alleviate food emergencies in the short term, and others have attempted to arrest resource degradation. But in many cases have not had the desired level of lasting effectiveness on development and food security, due to political instability, financial crises, institutional weakness, lack of coordination with local people, and other barriers.

Central among the stakeholders are food producers and resource users -- i.e., millions of farmers, fishers, herders, and community members -- who depend on and manage resources. Some are organized in local groups, including producer associations, community groups, small NGOs, and ethnic or religious organizations or clans. They logically have strong vested interests and influences.

The main national government institutions involved in food and environment issues are the Ministries of Agriculture, Animal Husbandry, and Fisheries, Ministries of Environment or Natural Resources, Agricultural Research Institutions, and/or sometimes Ministries of Planning and Land

Use/Management or Trade. (See IUCN stakeholder reports for details). Major donors and financial agencies, such as the World Bank, World Food Programme (WFP), Food and Agriculture Organization (FAO), UN Development Programme, and bilateral donors from European countries North America, and Australia also have active roles in supporting food security projects and some environment projects. Hundreds of NGOs and private sector organizations work on these issues in each country. They range from large international NGOs, such as CARE, World Vision, Food for Hungry International, Save the Children, and Catholic Relief Services, to grassroots organizations. NGOs have also been particularly active in food relief activities, and in resource projects, such as soil conservation and reforestation efforts.

The programs, policies and interventions of these stakeholding institutions are usually focused on *either* food security *or* environmental management/conservation. There is often an artificial separation between these two concerns. For example, Agricultural Ministries and programs are generally separate from Environmental ministries or programs. Such institutions and programs seldom address the linkages between food and natural resources. Moreover, the formal institutions in the past rarely involved the participation of communities and local stakeholders. In recent years, however, many of the GHA institutions are increasingly recognizing the links between resources and food security, and turning their attention to "sustainable" rural development. They have also attempted to shift from food emergency to a longer-term development orientation. These shifts have sparked efforts to integrate conservation concerns, particularly soil management, into agriculture activities, and efforts to include participation of local people. Yet, this kind of needed integration is not yet familiar to the stakeholders, and presents a challenge in food and environmental security.

Important regional stakeholders that address these matters are the Inter-governmental Authority on Development in Eastern Africa (IGAD), with headquarters in Djibouti, was formed in 1986 for regional development, the United Nations Economic Commission for Africa (UNECA- Program on Food Security and Sustainable Development), the Organization of African Unity, and the International Livestock Center for Africa. Regional and international conventions and treaties -- both historical and contemporary -- are also relevant institutional initiatives. For example, the Lake Victoria Environmental Management Programme and the East African Action Plan on the Marine and Coastal Environment are laying the groundwork for regional cooperation to sustainably use shared marine and aquatic resources (Ejigu, 1995). The African Conservation Convention of 1968, is a basis for regional actions to address urgent joint needs of soil conservation, sustainable resource use, prevention of water pollution, and watershed management (Westing, 1991).

In sum, the interests and actions of many stakeholders, along with the endowments of diverse natural resources, productive capacities, and abundant human resources, offer potential capacities and support to GHA. Such factors are often unrecognized or undervalued, in face of the overwhelming problems. Yet, the transboundary resources and cooperative initiatives among stakeholders are shared advantages that are valuable -- and urgently needed --to address food and environment insecurities.

III. THE MAGNITUDE, COMPLEXITY & CAUSES OF INSECURITY IN GHA

Although food insecurity and environmental degradation are problematic in many parts of the world, the magnitude and severity of these problems in the Greater Horn of Africa are extreme and alarming. Social and political instability, conflicts, and persistent poverty are also pervasive; they compound the human suffering. The region's food and environmental problems tend to be concentrated in zones of intense resource use, called "*critical resource areas*" (often transboundary), where people are highly vulnerable. The root causes of these interrelated problems need to be addressed, as explained below.

A. Food, Socioeconomic, and Environmental Conditions and Trends

1. Agriculture and Food Insecurity

Approximately 46 percent of the population in GHA, some 71 million people, are chronically food insecure, according to 1989 data (USAID/State, 1994). This percentage is greater than that of the overall figure for Africa, which was 33 percent in 1990. Food production per capita declined in the region by more than 16 percent between 1980 and 1993. Average productivity levels of agriculture (per unit of land) has also declined. The nations increased food imports in attempts to fulfill needs; but this approach has strained trade balances. (USAID/State, 1994). (See Figures 5- 8, Table 4)

Serious famines and food emergencies have struck in particular zones of GHA, especially refugee camps or resettlement zones. Most of these famine-struck areas are also ravaged by war, and in fact, conflicts often underlie the food problems. (See Figure 6.) In the mid 1990s alone, such severe emergencies have debilitated people in many of the GHA countries (Table 3).

In addition, certain groups of populations are more vulnerable and suffer disproportionately from hunger: the poorest people, and particularly women, children, and landless refugees are among the most vulnerable and make up the largest percentages of the hungry people. These groups are also vulnerable to displacement and resource constraints given their lack of legal tenure security, and lack of income. It is important to *focus on these vulnerable peoples and areas* -- in order to design strategic programs for food and environmental security.

Although several of the GHA countries have increased the land area and earnings in export-oriented agriculture in recent years, this strategy does not generally help the countries and communities to achieve food security. Although export growth is theoretically intended to help the economic situation and has benefitted the enterprises involved, it has sometimes reduced production capacity for immediate local needs. This trend also increases dependency on uncertain export markets. Meanwhile the hungry local people often do not benefit; internal food insecurity continues or worsens. For example, even though Ethiopia exported thousands of tons of wheat to Kenya in 1996/97, food deficits are still serious for the population (Masefield, 1997, Kedir, 1997). The government's claim of "food self-sufficiency" is misleading, because an estimated 52% of Ethiopia's population is food insecure (Kedir, 1997). Moreover, export-oriented farming systems usually depend on uniform high-input agricultural technologies, which have adverse environmental impacts, discussed in Part III.

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Table 3: Recent Severe Famines and Food Emergencies in the GHA region

Country (dates)	Numbers of people	Features of food emergency	Food/crops & livestock affected	Political or social situation
Rwanda (1993-94)	At least 1 million displaced/refugees need food aid	Food crisis/deficit From 1994 war and lack of production	Roots, tubers, plantains, maize, sorghum	1994-95 serious ethnic conflict & thousands killed
Somalia 1996	240,000 displaced 600,000 returnees	Poor harvest, 90% crop loss in some areas	Main food crops: Maize, sorghum, sesame	Failed state, civil strife, inter-clan fighting - root cause of crop loss
Ethiopia 1996 1981-1995 average	3 Million people need food aid 10% of the population is drought affected	Underproduction Crop loss in many areas	maize, tef, sorghum, wheat pulses	Displacement, socioeconomic crisis
Sudan 1984-85	12.5 million starving (½ population)	Caused by drought, market failures & inequity	All Grains	Social disorder Economic crisis
Tanzania 1996	630,000 refugees from Rwanda & Burundi	Drought, poor food distribution, severe food scarcity	Maize, roots, tubers, sorghum, pulses, rice	Dislocation, economic decline
Uganda 1996	300,000 refugees from Rwanda & Burundi in north	Poor food distribution, severe food scarcity, refugee induced deforestation & groundwater overuse	Maize, roots, tubers, sorghum, pulses, rice	Dislocation, economic decline Refugees often outnumber local population

Sources: FAO, 1996, Kedir, 1997, Olsson, 1993, and UNHCR/RPG, 1996 (abstracted by WRI)

2. Nutrition and Health Conditions

GHA's nutritional and health status indicators also reflect high food insecurity. The per capita calorie availability for the region (1,950 Kcal per day) is less than the international minimum standard for survival of 2,100 calories, and much less than the standard for an adequate diet of 2400 calories a day. These low nutritional levels are even below those in the '60s in GHA. In Ethiopia for example, up to 52% of the population is estimated to be food insecure. Here, more than four million people are given food aid each year; and domestic food production in the past two decades was sufficient only to provide 77% of the minimum acceptable average requirement. (ADE, 1996).

Malnutrition is a cause of up to 80 percent of maternal deaths. The regional infant mortality rate is 107 deaths per 1000 people, and malnutrition accounts for more than 1/3 of infant and child deaths.

Fig. 5

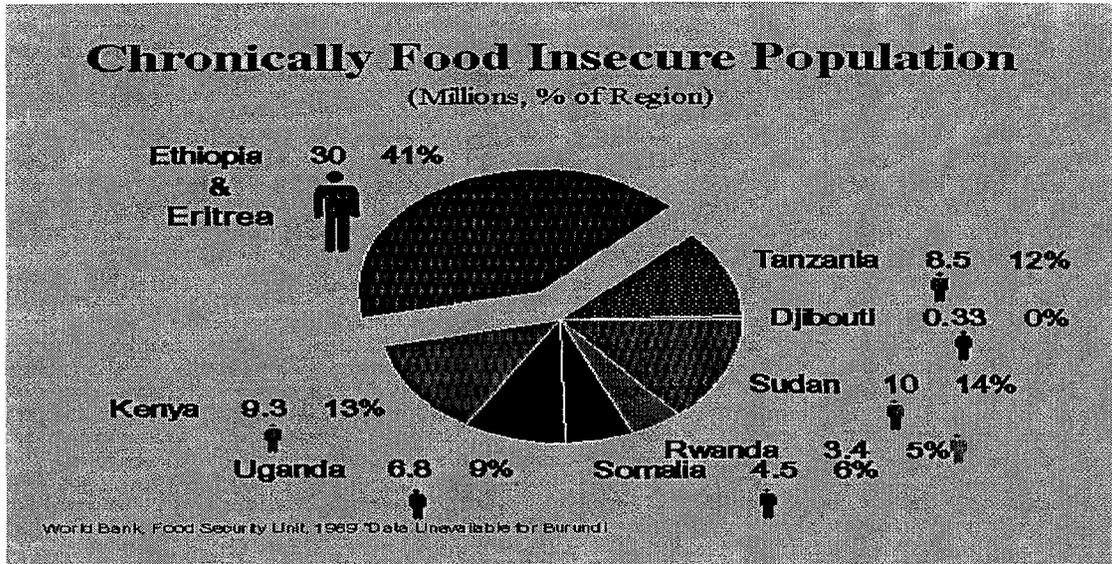


Fig. 6

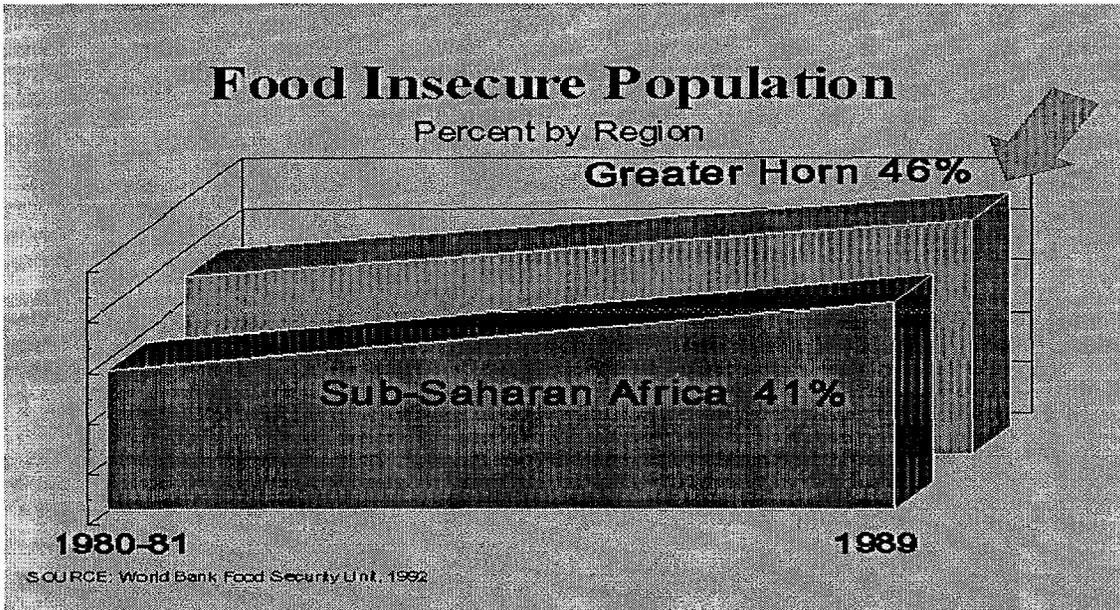


Fig. 7

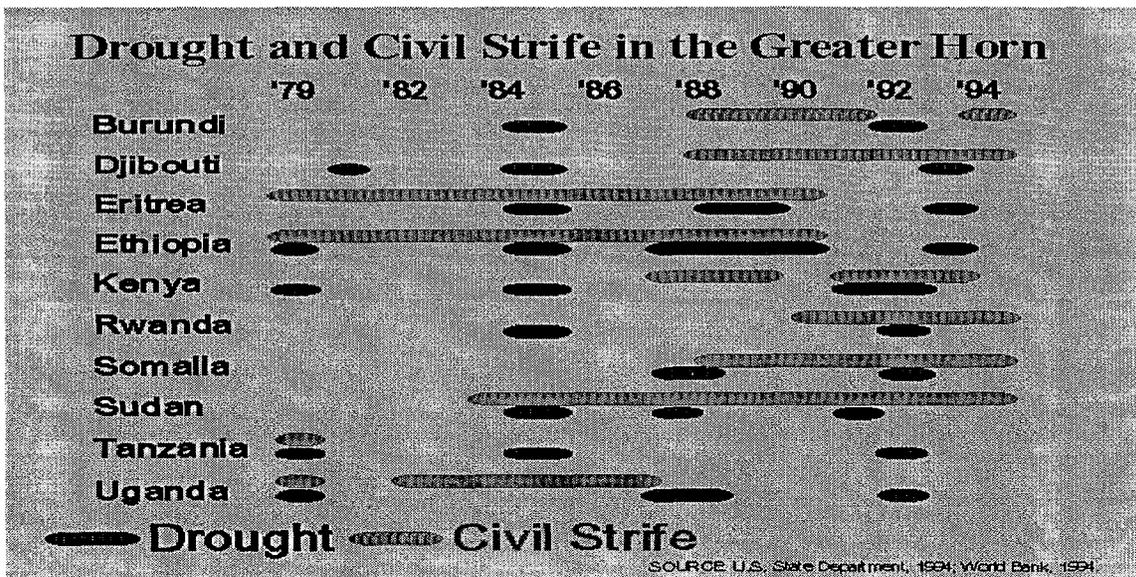


Table 4: Basic Indicators for Countries in the Greater Horn

Country	GNP Per Capita (US \$)	Infant Mortality Rate (IMR) (1992)	Prevalence of Wasting Children Under 2 (1990s)	Fertility Rate (1992)	Adult Illiteracy
Burundi	210	106	43.5	6.8	50
Djibouti	----	115	----	----	----
Ethiopia	110	122	45	7.5	75
Eritrea	----	----	----	----	----
Kenya	310	66	31.6	5.4	31
Rwanda	250	117	38.4	6.2	50
Somalia	----	132	----	6.8	76
Sudan	----	99	----	6.1	73
Tanzania	110	92	36.7	6.3	35
Uganda	170	122	31.8	7.1	52
Greater Horn	167	107	----	----	57
Sub-Saharan Africa	530	99	----	6.1	50

Table 5: Land Use / Degradation Indicators in Africa

Type of Degradation in Africa	Area (million ha)	Percentage
Land extremely/strongly degraded 1992	74	NA
Land lightly/moderately degraded 1992	245	NA
Desertification/overgrazed lands 1990	750	NA
Degraded soils: Severe/Moderate 1990	321	NA
Degraded soils: Light 1990	174	NA
Degraded Irrigated Land	1.9	18%
Degraded Ranged Croplands	48.86	61%
Degraded Range Lands	995.08	74%
Degraded Total Agricultural Dry Lands	1045.84	73%

Fig. 8

**ANNUAL GROWTH IN FOOD PRODUCTION
PER CAPITA IN THE GREATER HORN OF AFRICA COUNTRIES**

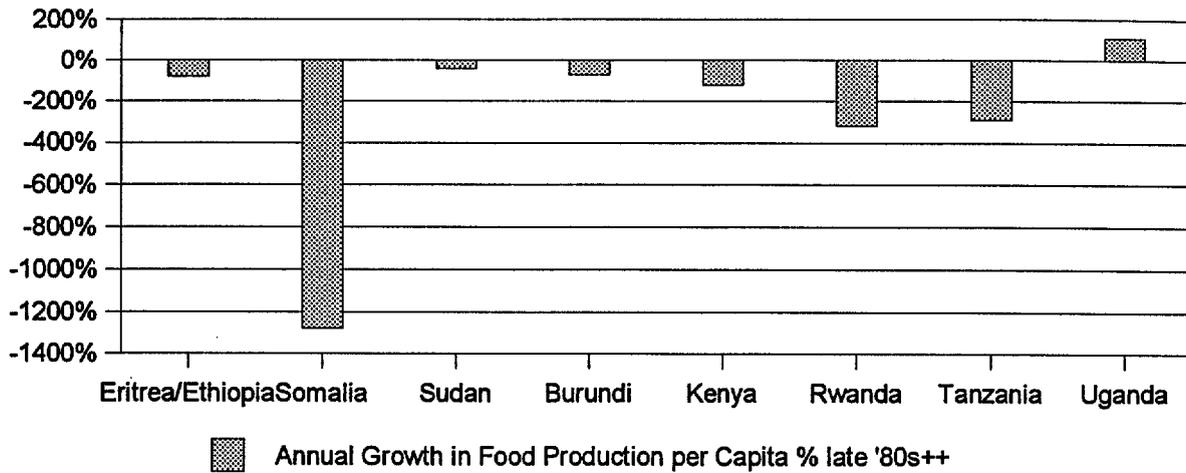


Fig. 9

**ESTIMATED LOSS OF FORESTS, WOODLANDS,
SAVANNAS AND GRASSLANDS**

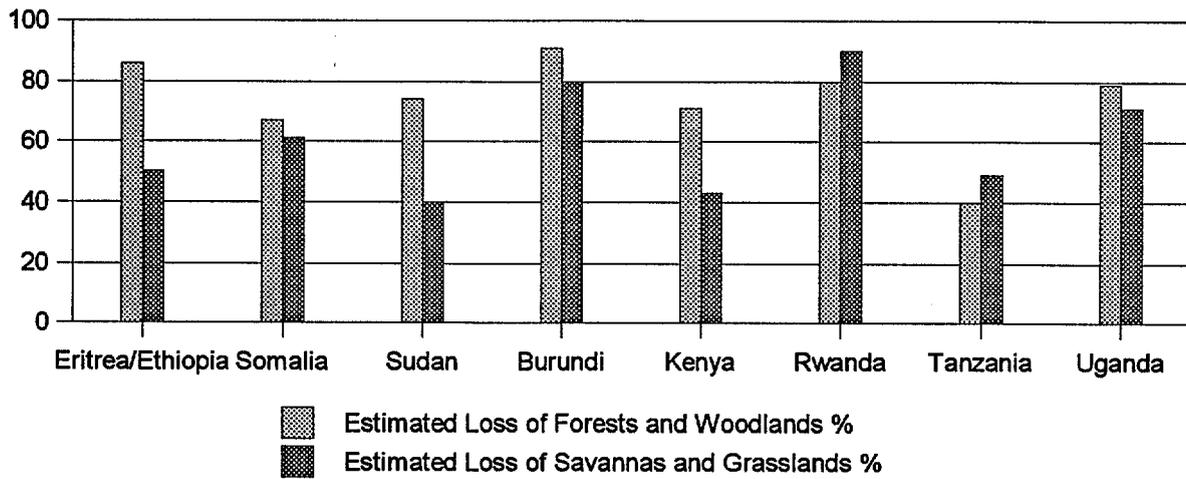
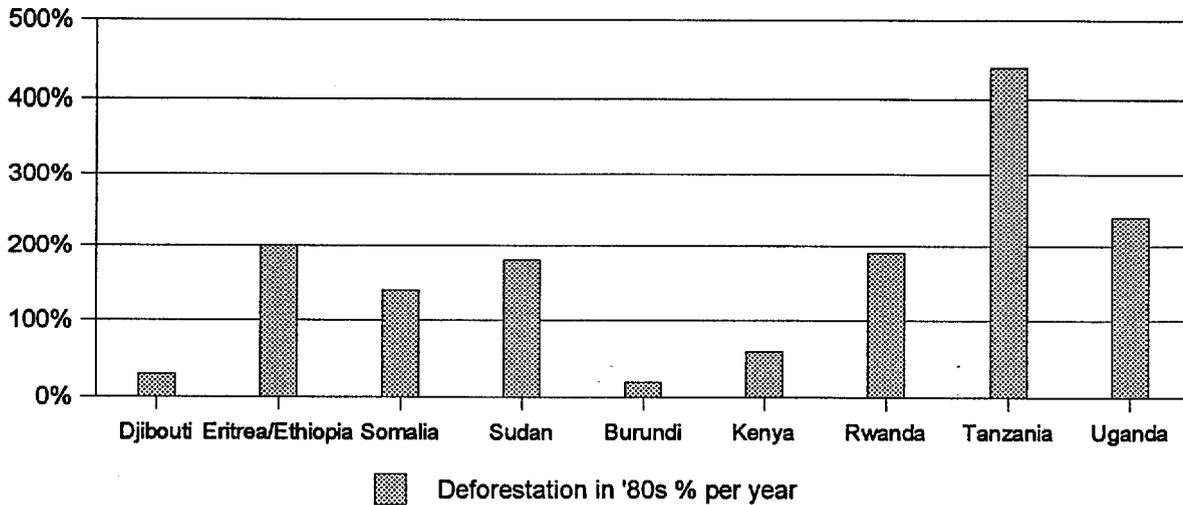


Fig. 10

DEFORESTATION IN THE GREATER HORN OF AFRICA COUNTRIES



30 to 45 percent of the children under 2 years suffered from wasting -- i.e., low weight to height measurements (USAID/State, 1994). These problems tend to be concentrated in certain areas of major social crisis: In Rwanda alone, for example, half of the children suffer from chronic malnutrition and growth stunting (Myers, 1994) and adult nutrition has deteriorated to only an estimated 1510 kcal/person/day (Uvin, 1996). In Ethiopia, over half of the population is food insecure, and domestic food production in the past two decades was sufficient only to provide 77% of the minimum acceptable average requirement per person per day (1,620 kcal/day/person vs. 2100) (ADE 1996). These poor nutritional conditions undermine labor productivity and hinder economic growth. (See Table 5)

3. Socioeconomic and Demographic Features

Poverty is pervasive in the GHA and is closely tied to food insecurity. It can be seen as both a cause and an outcome of prolonged food deficits. "The GHA region is one of the poorest in the world. GNP per capita is \$167, and [GNP] growth rates, which were negative throughout most of the '80s averaged -2 percent in the early '90s (Clinton/GHAI, 1994)." Both agricultural productivity and economic growth have stagnated or declined. At the same time, most of the countries have deep foreign debts. Although export production has grown over the last several decades in several of the GHA countries, the export earnings have not offset the debt problems. Many of the countries face tremendous financial problems to fund food imports. The countries have received declining assistance for agriculture. From 1980 to 1990, for example, the regional development assistance banks reduced its assistance by two thirds, and the World Bank cut in half its loans for agriculture (FAO, 1995). The stagnation of economic growth is also exacerbated by conflict and political instability.

The population growth rate is high in GHA, averaging approximately 2.9 percent annually in recent years. The regional population has tripled from about 61 million in 1954 to approximately 186 million in 1994. (Clinton/State, 1994) At the same time, there is a high average infant mortality rate and low life expectancy rate, as shown in FIGURE 5. However, looking at aggregate population rates alone is not a sufficient explanation of food insecurity. Rather, frequent displacements and resettlements of massive numbers of people in GHA are usually more significant causes of insecurity than population growth rates *per se*. In 1994, there were at least 11 million refugees and internally-displaced people in GHA; the majority (7.3 million) were in Sudan, Burundi, Kenya, Rwanda, and Somalia. Another 11 million people were in danger of being severely affected by drought. Most refugees and internally displaced people flee their homes due to civil strife. A large proportion of these people in GHA are considered environmental refugees, or "*environmentally displaced persons*." (UNHCR, IOM, RFG, 1996). This means they are displaced (from their place of habitual residence, or have crossed an international border) due partly or entirely to environmental degradation or destruction, including both natural disasters, and human-induced degradation, such as soil erosion, desertification, and fuelwood depletion (Suhrke, 1993, UNHCR, 1996).

Refugees and displaced groups constitute a rapidly growing mass of landless poor people. They are highly vulnerable; they seldom have resources for sustained access to food supplies, and live under highly precarious conditions (Habtu, 1993, Masefield, 1997, Migot-Adholla & Bruce, 1994, Paarlberg, 1994). Landless women and children are particularly vulnerable to food deficits and displacement. Although increasing numbers of women are becoming heads of households, they usually lack secure land tenure and other rights and opportunities that can allow them to maintain or improve productive capacities (Cleaver and Schreiber, 1994, Field-Juma, 1996, Migot-Adholla & Bruce, 1994, Migot-Adholla et. al. 1994, Moock, 1986, Quisimbung et. al. 1994).

4. Degradation of Land, Watersheds and other Natural Resources

Environmental degradation is widespread and extreme in the GHA; the deterioration is so severe that some experts have warned of “threats of environmental collapse” (Hutchinson et al, 1991). Referring the Horn of Africa (four of the GHA countries), analysts suggest that “if the current environmental degradation is permitted to continue much longer, it will be likely that in a relatively near future human settlement in many parts of the region will become unsustainable” (Hutchinson et al, 1991).

Land and Soil Degradation:

In Africa as a whole, in the past half-century, approximately 2 billion hectares of land have been degraded, and 300 million are affected by extreme degradation, meaning high levels of soil erosion, nutrient depletion, and desertification (Pinstrup Anderson and Pandya-March, 1995). Another estimate suggests that *half* of Africa’s farmland has degraded soils and fertility loss (WRI/IIED, 1988). (See Table 3.) A significant proportion of this highly degraded land is in the Greater Horn of Africa. Land degradation refers to the reduction or loss of the biological or economic productivity of cropland, pastures, forests and woodlands. It results from inappropriate land uses and agricultural practices, overgrazing, or devegetation, which leads to erosion and deterioration of soil properties (Stahl, 1993). (See Box 2). When land degradation occurs in arid or semi-arid areas, it is called desertification. Recuperating desertified land for agricultural purposes can be difficult and costly. The problem is aggravated by the fact that the soils in many areas of GHA are naturally fragile or poor for farming, since they are acidic or nutrient-poor (Cleaver and Schreiber, 1994, Hutchinson et al, 1991, Stiles and Brennan, 1986) (See Table 5)

One indicator of land degradation is soil erosion and loss of topsoil. For example, an estimated ten billion tons per year of soil was lost in the Ethiopian highlands during the 1970s (Myers, 1986) leading to around 30 percent of Ethiopia’s agricultural land being degraded by 1990 (Hutchinson et al, 1991). Recently in the highlands, annual topsoil loss is estimated to be 2 billion metric tons and ranging from 2 - 10 cm per year (Abbi, 1995). Another indicator of degradation is soil nutrient depletion. Some analysts estimate that most GHA countries have high nutrient depletion, with more than 20 kg/ha/yr of Nitrogen loss, more than 8 kg/ha/yr of P loss, and more than 20 kg/ha/yr loss of K (Reuler and Prins, 1993). However, reliable data on degradation are lacking in GHA countries.

The degradation of pasture land, mainly from overgrazing, has been a problem in many parts of GHA (Steinfeld et al, 1996, Hutchinson et al, 1991, Lane and Pretty, 1990). Some estimates suggest that up to 80% of pastures in Africa show degradation (WRI/IIED, 1988); and the problem is particularly serious in certain regions of the GHA. This trend does not mean, however, that pastoralism is inherently degrading. On the contrary, traditional pastoralism is a relatively sustainable and effective use of arid lands. However, over the last 2-3 decades, pasture land in GHA has suffered erosion, desertification, and declining productivity of livestock (McNeely et al, 1995, Hutchinson et al, 1991, Steinfeld et al, 1996, Homewood and Rodgers 1992, Jodha, 1990, Koller-Rollefsen, 1993, Lane and Pretty 1990, McNeely et al, 1995, Scoones, 1992). Underlying such changes in pastoral conditions are political and social pressures, including resource conflicts, inappropriate agricultural modernization projects, and demographic pressures. These factors have pushed traditional pastoralists to change their practices, mainly by forcing them to be sedentary (Cousins, 1996, Galaty et. al., 1994, Moris, 1988, Lane & Pretty, 1990, Sayoum, 1995). The aggregate figures about pasture degradation may be exaggerated; but the problem is significant in many areas (Blaikie and Brookfield 1987, Cleaver and Shreiber 1994, Galaty et. al., 1994, IDS, 1995, Lane and Pretty, 1990, Steinfeld et al, 1996).

Box 2: Examples of two-way links: Impacts of soil erosion on food security and vice-versa

Soil erosion due to overuse or mismanagement of agricultural land, is a common problem throughout the Greater Horn of Africa; it leads to depletion of top soil and nutrients, reduced moisture retention, and reduced organic matter, which damages the productive capacity of the land. This leads to declining fertility, low productivity of soils, and therefore to declining crop yields, which then contributes to food insecurity. This can also provoke migration of local people.

At the same time, food insecurity and poverty can lead to soil overuse. When lacking food and alternative sources of income, people tend to increase the intensity of efforts to produce on soils that have lost productive capacity. For example, they reduce fallow periods or attempt to farm on marginal areas. Poor people often do not have access to resources, capital, or information, that enable them to use soil conservation practices; this can lead to soil degradation. Furthermore, food production strategies dependent on modern, capital intensive, monocultural agriculture have seldom solved these problems, and instead have had adversely ecological and social impacts in the GHA. The introduction of high-yielding varieties and export-oriented chemical-dependent agriculture has often replaced locally adapted food crops. These changes have led to health hazards, erosion, salinization and fertility loss, which can undermine food security and livelihood.

Sources: Blaikie 1985, Cleaver and Schreiber, 1995, Reardon and Shaikh, 1995, WRI, 1996, Westing, 1991

Watershed degradation - critical transboundary areas:

Although watersheds in major lakes and rivers of GHA are valuable cradles of agriculture and settlements, the land and water resources in the watersheds have been seriously degraded and depleted. The soil degradation problems tend to be concentrated and more serious in watershed areas, and the soil runs off into the lakes and rivers, which causes sedimentation, contamination, and serious disruption of water flow. Deforestation around watersheds aggravate these problems of erosion, degradation and water depletion. These processes lead to declines in productivity. Fisheries in these areas are also becoming seriously depleted from rapidly increasing catches and overexploitation by fishing industries and by rising populations in these regions. The expansion of towns and cities in watershed areas has also greatly increased the dumping of sewage, industrial effluents, and other wastes into water sources. This compounds damage of water quality and harms health.

These watershed degradation problems are shared commonly by the GHA countries, and they are particularly serious in the Lake Victoria region (shared by Kenya, Tanzania, and Uganda). Over time, the quantity and quality of fisheries in the lakes have declined (especially of endemic *Haplochromine ciclids*). Consequently, growing numbers of the people, including thousands of refugees, suffer from food insecurity. The people also suffer from an increase in exotic species (*Lates niloticus*, water hyacinth and other weeds), illegal fishing techniques, inadequate land use management, well as the public health and ecosystem effects of water pollution (Akatch, 1996). Since 1994, the Lake Victoria Environment Management Programme is beginning to tackle regional sustainable management issues of a shared lake. But it is struggling to operationalize its ideas and incorporate communities' concerns, food security, fisheries development and pollution prevention (Akatch, 1996, Ejigu, 1995).

Biodiversity Loss:

Another alarming aspect of environmental degradation is the decline in biodiversity, particularly the erosion of agricultural biodiversity in crop and livestock genetic resources, in farming systems, and in fisheries. Although traditional farming and pastoral systems encompass a remarkable diversity of crops, livestock/grasses in the region, this diversity is becoming eroded and lost over time, and this jeopardizes food security, and increases risks for the local people (Worede, 1992). Diverse agroecosystems and livestock are being rapidly replaced and displaced in GHA in the late 20th century. Extinct domestic animals in the Greater Horn include the Rwandan Inyambo cattle of the Watusi variety, Tanzania Iringa red cattle of the East African zebu varieties, Nubian wild ass last seen in Ethiopia and Sudan 1960s; endangered domestic animals include the Somali pony, the Tanzanian Zanzibar Zebu, Chagga Sukuma cattle, the Ugandan turkey (Scherfe, 1995).

These losses are partly due to the increasing growth and spread of monocultural agriculture and uniform high yielding variety crops, backed by development agencies and policies (Examples found in McNeely et al, 1995, Miller et al, 1992, NAS, 1993, Reid and Miller, 1993, Scherfe, 1995, Thrupp, 1997) Habitat destruction and war have contributed to genetic erosion as well. For example, the Somali war resulted in the loss of gene banks and research capacity in indigenous crops such as sorghum, banana, millet, sesame and cowpeas when the Afgoi and Baidoa genebanks and research stations were looted, destroyed and used as caches for weapons early in the Somali war (Raymond & Brindley, 1993). These trends increase threats to food security.

Deforestation and Fuelwood Depletion:

Deforestation and losses of other forms of vegetation have also accelerated recently in GHA. (See Figures 9 and 10). This erodes agrobiodiversity and leads to land degradation and climate disruption. In Africa overall, forest loss is estimated at about 2.9 million hectares per year (Cleaver and Schreiber, 1994). In many areas, land has been virtually denuded of vegetation, primarily for fuelwood supplies (Westing, 1991). Moreover, reforestation has been minimal; deforestation in Africa is 30 times as much as reforestation (Paarlberg, 1994). Savannas and grasslands have also been devegetated and lost in the region. (See Figure 10) Burning of forests and grasslands has been used traditionally as a rational management tool, but recently burning has become widespread and uncontrolled, contributing to soil degradation, pollution and climate changes (Cleaver and Schreiber, 1994). Increasing scarcity of fuelwood is a related concern, which aggravates food insecurity. Throughout the region, rural people lack cooking fuel needed for survival. Women and children, who generally collect fuel, must walk longer distances to obtain wood supplies. They increasingly use dung and crop residues for fuel, which can damage health and detract from soil fertility (Hutchinson et al, 1991).

Natural Constraints and Drought:

The natural environmental conditions also have inherent limitations in many parts of GHA. As noted above, soils in several parts of the Horn of Africa have inherently poor agricultural capacity (Hutchinson et al, 1991). In many arid areas of the Northern part of GHA, droughts occur naturally every one of five years at least (USAID/State, 1994). In Ethiopia, for example, 25 percent of the rural population in 55 percent of the arid lands suffers from drought (Kiros, 1991). Water scarcity also affects parts of Kenya, Uganda, and Tanzania, largely due to natural conditions (Cleaver and Schreiber, 1994, Fallen-Mark, 1991). However, human-made degradation have aggravated climatic variance, and increased the frequency of droughts (Mattson and Rapp, 1991, Cleaver and Schreiber, 1994, USAID/State, 1994). Other natural disasters, such as pest infestations, disease epidemics, and

floods also have led to serious crop losses in GHA. A recent rinderpest infestation of livestock and wild animals, for example, has become a cross-boundary threat to food provisions in GHA countries.

5. Degradation of Coastal and Marine Resources

A major problem affecting coastal and resources in GHA is coastal erosion, which leads to siltation of coral reefs and seagrass beds, blocks photosynthesis, and clogs feeding apparatus of corals and other reef organisms. At the same time, there is increasing habitat degradation and pollution of these areas, from destructive fishing methods, dumping of municipal, agricultural, and industrial wastes, and from oil tanker traffic. Ports and harbor facilities have also become silted and degraded. Poor land use practices and watershed destruction in the coastal lands also contributes to this coastal degradation. Large stretches of coral reefs have been destroyed below estuaries, for example near the Rufiji River Delta in Tanzania and the Tana River Delta in Kenya. At the same time, coastal and marine fish stocks are becoming rapidly depleted, hindering food security for thousands who depend on this protein source. The uncontrolled expansion and exploitation by fishing industry, tourism, and of oil extraction and shipping have contributed to these problems. Some of the coastal "hot spots" are major port cities of Dar-es-Salaam, Mombassa, and Maputo, where there is serious coastal resource pollution from urban expansion, industrial effluents, and agricultural runoff, and port traffic. The Red Sea coasts are also areas of special concern, highly vulnerable subject to hazards and degradation, mainly due to oil spills. These problems again transcend city or country borders: they are common resource predicaments with high costs, and they require cooperation to resolve.

6. Critical Resource Areas

Dispersed throughout the GHA are zones deserving particular attention -- called "*critical resource areas*" -- which have been noted above. In these areas, both food insecurity and environmental degradation are severe, where natural resources are intensely used, and populations are concentrated and dense. The conditions are "critical" in terms of both human suffering and biophysical decline. Many of these are transboundary areas, since the people and resources involved cross borders.

Many of these critical areas are found in zones of recurrent conflict and vulnerability, particularly in areas of large refugee concentrations, and densely-populated settlements of displaced peoples. They include areas in Rwanda, Somalia, Tanzania, Kenya and Sudan where masses of people have been dislocated from conflicts, and suffer from devastation of farming and herding, acute famines, and extremely high death rate (Unruh, 1995, UNHCR, 1995). Resettlement areas or refugee camps, for example, are generally over-crowded, and rarely have sufficient land, water, fuelwood, and other resources for the people. Consequently, the resources rapidly become degraded and depleted. These areas tend to have very poor sanitary conditions, contaminated water sources, and the people suffer ill health, as well as political insecurity (de Waal, 1989, Ek and Karadawi, 1993, UNHCR, 1995).

Watersheds of key rivers and lakes are also among the most critical transboundary resource areas that are under threat, as described above. Watersheds represent concentrated areas of activity; and their great potential for production is being undermined by mismanagement and overexploitation of the resources. The Lake Victoria watershed region, for example, is one of the major areas requiring coordinated attention. Some of the *grazing commons* that cross political boundaries have become a source and place of conflict and concern as well (Hutchinson et al, 1991). In these pastoral areas, tenure systems are also highly insecure; there is a special need for conflict resolution. (Unruh, 1995).

Table 6: Key Concerns & Transboundary issues, based on IUCN Country Stakeholder reports

Key Issues	Eritrea	Ethiopia	Kenya	Somalia	Tanzania	Uganda
Poor Resource Endowment	Low and erratic rainfall; droughts; thin, infertile soils; fragile rangelands	Low and erratic rainfall, thin and infertile soils, erosion	Limited agricultural land resources; low and erratic rainfall, 'poor agricultural potential'	Low and erratic rainfall, fragile rangeland ecosystems, droughts in '79-80, '83, '86	Low and erratic rainfall	Poor soils, low and erratic rainfall
Poverty and Malnutrition	Severe - 50% unemployment, widespread malnutrition, no GDP given	Severe - Majority of the population is undernourished. Poverty level is one of highest in the world.	Yes - average GDP under \$300 per year	Severe - average GDP \$140 to \$170 per year	Severe - GDP just over \$100 per year.	Yes - IDA country.
Inappropriate Land Tenure	Previously, poor land rights; new land tenure laws developed but not yet enacted; few defacto rights for rural villages or pastoralists.	Yes	Author cites inappropriate tenure, but doesn't describe.	Yes - Land Act of 1975 divests pastoralists of land rights, favors commercial and mechanized agriculture		Author cites inappropriate tenure, but doesn't describe.
Civil (Clan) Wars	Yes - 30 year war for independence from Ethiopia, ending 1991.	Civil (?) war caused famine in the 70's and 80's. Conflict with Eritrean rebels, intensifying in the 90's	Political tensions, fuel corruption problems .	Yes. Recent wars wreak havoc. Clan fighting cut off regions of the country, halted production and caused famine in the '90's.	No mention in country report; no serious problems recently	Conflict in northern Uganda (Kumi and Soroti districts); also during Amin Era
Inappropriate Agricultural Practices	Shifting cultivation, cultivation of steep slopes, overgrazing connected with pastoralism	Degrading practices in crop and pastoral systems	Lg commercial and all smallholder mixed cropping, crop-livestock, and pastoral systems are unsustainable: deforestation, erosion, overgrazing, fallow reduction	Agropastoralism, commercial livestock are unsustainably practiced leading to erosion, loss of soil fertility, and declining yields.	Unsustainable cropping and livestock systems.	Assume smallholder crop -livestock production and pastoralism in areas of high population density, small land holdings, steep slopes, or fragile drylands to be degradative
Transboundary Conflicts	War for independence from Ethiopia halted agricultural production	Conflict with Eritrean rebels.	Conflict with Somalia (date?)	Conflict with Kenya, Ethiopia	Report does not specify	No mention in report.
Refugee Pressure	750,000 refugees fled the country, reducing labor for agriculture; return of 6,000 households to settle in western Eritrea	Displaced persons from within Ethiopia, and refugees from Somalia	Refugees from Uganda (70's), Ethiopia, Somalia, Sudan ('90's), some from Tanzania	Refugees from Ethiopia, from within Somalia	Refugees into Kigoma and Kagera from Uganda, Rwanda, and Burundi.	Refugee influxes from Sudan, Rwanda, and Zaire
Coastal Issues	Coastal degradation,, but no mention in country report	Fisheries depletion and some coastal degradation	Coastal pollution and overfishing, mainly eaer Mobassa	Costal fisheries important , but starting to be delpeted	Pollution and fish depletion near Dar Es Salaam	
Watersheds/Water Supply	Report doesn't mention, but water to be important issue: shares Nile with 11 other countries; water scarcities have posed problems at times	Shares Juba-Shebelle drainage basin with Kenya and Somalia; shares the Nile with 11 other countries; watershed degradation and droughts are problems	Yes! Shares Juba-Shebelle drainage basin with Ethiopia and Somalia; shares Lake Victoria with other countries; possesses 60% of Lake Victoria headwaters and Nile headwaters; yet the watersheds are seriously degraded	Shares Juba-Shebelle drainage basin with Kenya and Ethiopia; water scarcities and watershed degradation are problems ;	Shares Nile and Ruvuma river basins, shares Lake Victoria with Uganda and Kenya, shares rivers Kagera (with Rwanda) and Mara (with Kenya)	Shares Lake Victoria with Kenya and Tanzania; shares Nile River

Coastal zones in “hot spots” may also be considered major critical areas; and the degradation of coastal resources and fisheries also demands collaboration among stakeholder and countries.

In sum, it is important to recognize that all of the above adverse economic, social, and environmental conditions are not only interlinked, but are borne particularly severely by the poorest of the poor. (Khogali, 1991, Longhurst et. al., 1986, Masefield, 1997, Maxwell, 1991, Walker, 1989). *Critical shared resources*, as noted earlier, deserve special attention. Country stakeholder analyses of these food security and environmental issues also revealed the major common concerns from the GHA region, as indicated on Table 6.

B. The Roots of Food-Environmental Insecurity in the Greater Horn

The alarming conditions in GHA show the seriousness of these crises on many levels and in multifaceted ways. We have seen that hunger, environmental deterioration, and social/political insecurity are interrelated; and these are *symptoms* of deeper forces and development paths. To overcome these crises requires addressing the *causes* underlying the problems, not just treating the symptoms. The deeper roots of food insecurity and environmental insecurity are largely political-economic and social phenomena -- including unsustainable patterns and policies of development, market inadequacies, weak institutional and legal capacities, demographic pressures, and socioeconomic inequities and conflict, as explained in this section.

1. Economic policies and programs

Many analysts point to poverty as a cause of food and environmental problems. While this has some element of truth, the underlying roots of poverty are unsustainable patterns and policies of economic development, which include the following:

a) *Market and pricing policies*, including subsidies for grains and agrochemicals, price distortions created through fixed prices, and credit policies, have aggravated instabilities and problems for rural populations to gain access to food and to develop agriculture (Maxwell and Lirenso, 1994, Steinfeld et al, 1996, Barraclough, 1995, FAO, 1996, Pretty et al, 1996). Pricing policies and subsidies for pesticides, water, and other inputs have also contributed to environmental degradation and to the wasteful use of resources in agriculture and livestock systems (Reardon and Shaikh, 1995, Lane and Pretty, 1995, Paarlberg, 1994, McNeely et al, 1995, Steinfeld et al, 1996, Pretty et al, 1996, Olsson, 1993). Market malfunctions and an unjust credit system are root causes of famine in the Sudan, for example (Olsson, 1993). Moreover, unfettered market liberalization policies, without integration of social and environmental provisions, tend to aggravate unfair competition and inequitable terms of trade, which compounds food insecurity and increases pressures on resources (Barraclough, 1995).

b) *Inappropriate Development programs*, particularly large-scale settlement projects and Green Revolution agricultural programs, have contributed to social and environmental problems. Although they sometimes have benefitted special interest groups and boosted yields in some zones, they have seldom alleviated food and environmental insecurity. Uniform varieties and monocultural cropping systems imposed in top-down extension programs are often unsuited to local conditions and needs, and are usually unaffordable or unaccepted by the local people. They have undermined biodiversity that is important to peoples' livelihoods in the region. (See Box 3)

c) *Structural Adjustment policies* (SAPs) have cut off funding for social services, education, and for rural credit, dismantled institutional support and social networks for rural peoples, and imposed austerity measures, while creating pressures to increase export production. SAPs have seldom led to poverty/hunger alleviation; rather, food insecurity has continued or even increased in many countries, while debt remains high and the poor are often displaced (Reed, 1996, Bagachwa et al, 1996). In Tanzania, for example, after SAP were established, input prices increased dramatically, debt is 28% of GDP, and aid accounts for 75% of GDP; deforestation increased in miombo woodlands, up to 2 percent per year, since farmers expanded cash crop cultivation to take advantage of market liberalization policies. Reforestation and agricultural extension programs were cut. The consequent overexploitation of resources has aggravated degradation and food deficits. (Bagachwa et al, 1996).

BOX 3: Agricultural and Settlement Schemes as Causes of Food/Resource Crises

Examples of unsuccessful agricultural and development programs and policies are found during both colonial and contemporary periods in the GHA. Many of them involve nationalization and state control of land resources or privatization and land concentration. In the Sudan, for example, large-scale mechanized agricultural programs, which have been established over many decades, have favored large-scale producers and export production. They virtually ignore local food needs and the traditional sector, which employs about 70-80 percent of the population (Olsson, 1993). Although the Sudan exports food, local people suffered from grain deficit and food insecurity during the 1980s, due to policy and programmatic biases (Maxwell, 1991).

The Awash River valley, covering 10% of Ethiopia's land, has been transformed by dams and commercial plantation schemes, including sugar, banana, and tobacco plantations. These schemes, along with the Koka Dam, were justified by the government as a means to settle and modernize the Afar pastoralists, to reduce population pressure on land elsewhere, and to provide water to Addis Ababa. These farms leased land out mostly foreign or large concessionaires and increased mechanization and irrigation by giving them tax-free imports. Yet, these initiatives aggravated the 1973 drought and famines and land degradation, displaced Afar pastoralists and small holder migrants in the Awar, and created an inappropriate balance between staple food crops and commodity export crops, and therefore increased food insecurity. (Galaty, et. al. 1995).

In Tanzania, a major Groundnut Scheme of the 1940s-50s, and later in the 1980s, a large-scale wheat cultivation program supported large-scale monocultures to the exclusion of other forms of production and with scant regard for customary rights to land. The wheat program displaced 30,000-50,000 pastoralists who lost access to 40,000 ha of prime dry season *muhajega* grazing lands (Lane & Pretty, 1990). In the GHA, many policies over time to settle traditional pastoralists have undermined customary natural resource management practices, and reduced critical mobility and flexibility of the livestock, leading to overgrazing and degradation (Steinfeld et al, 1996). Cropping programs in these areas have also degraded soils and eroded biodiversity.

2. Inequities in distribution/access of resources and income

Disparities in access, control, and distribution of resources underlie food insecurity and environmental degradation. Serious inequities in resource distribution exist not only between North-South, but within GHA countries, between classes, ethnic groups, and between men and women. The control of resources by the state and wealthy sectors prevents poor people from gaining access to income opportunities and to resources and food (Paarlberg, 1994). Income distribution is highly skewed in some countries, such as Kenya and Tanzania, which aggravates constraints for the poor.

Credit policies and other government policies aggravate such inequities, by favoring capitalized producers/businesses and excluding the poor (Olsson, 1993, Reardon and Shaikh, 1995). Competition over resources also increases inequities in many areas, since wealthy enterprises and landowners and state entities usually have competitive advantages (Barraclough, 1995, Watts, 1987, Lane and Pretty, 1990, Hutchinson et al, 1991).

Inadequate distribution systems, including lack of markets, market biases, infrastructure weaknesses, and lack of social services, are also causes of disparities in food supplies. In the Sudan, for example, “the famine of 1984/85 was not primarily caused by shortage of food, but rather by poor distribution of food, transportation costs, middlemen, abuses in the customary *sheir* credit system and hoarding causing prices to sky-rocket and a government doing nothing to protect those affected.” according to Olsson (1993). Women face particular constraints in this sense, affected by heavy restrictions on legal rights, access to land, capital, and education. Such gender disparities can contribute to agricultural decline, and harm society overall (Cleaver and Schreiber, 1994, IFPRI, 1994, Sigot, Thrupp and Green, 1995). Distributional inequities also contribute to resource degradation: “*Social inequality allows for different motivations for degradation – the greed of the rich, and the desperation of the poor*” (Steinfeld et al, 1996). Poor people who lack access to resources often have no choice but to overuse resources, and are often forced to use marginal lands.

3. Political conditions: Instability, Conflicts, and Corruption

Political conflict and instability are powerful influences behind most of the problems and insecurities already described. GHA is one of the most conflict-ridden regions in the world over the past 2-3 decades. (See also Table 1 and Figure 6.) Wars inevitably disrupt or destroy agricultural production, cut off transportation systems, destroy infrastructure and marketing channels that are crucial for food supply. Governments’ funding of military forces usually leads to reduced funds for education, social services, and economic needs (Olsson, 1993). Wars devastate natural resources, by burning and destroying forest and vegetation, contaminating land and water, and undermining energy sources. “Multiple occurrences of conflict and famine has wrought devastation and disrupted human ecologies, resource use, and access arrangements of millions of people over very large areas, with examples ranging from collapsed states of Rwanda, Somalia, Liberia, and conflict-famine situations of Ethiopia, and the Sudan....” (Unruh, 1995) Many of the conflicts are tied to control of resources and competition over customary, state, and private tenure systems. This conflict tends to disrupt tenure systems, and can lead to displacement and migration of farmers and pastoralists (Hutchinson et al, 1991, UNHCR, 1995, Unruh, 1995, Olsson, 1993).

The lack of participatory democracy has been identified as another political cause of problems in the region (Steinfeld et al, 1996, FAO, 1996, Barraclough, 1996). State systems have continued to be non-democratic and often oppressive, following the colonial legacy, which have not allowed opportunities for participation of civil society. Similarly, *corruption* can contribute to food/environmental insecurity; it provokes instability, inequities, and institutional weaknesses. Although corruption is difficult to document, it is officially recognized as a major cause of such problems (FAO, 1996, UNHCR, 1995)

4. Tenure Insecurity and Legal Constraints

Policy makers and analysts often assume that customary land tenure (such as traditional communal systems) is inadequate for development, and that it leads to “tragedy of the commons” from overgrazing and land use degradation (Migot-Adolla & Bruce, 1994). Therefore, GHA governments, particularly in Kenya, Somalia and Uganda, have instituted tenure policy changes and programs to replace customary land tenure by new land tenure systems upholding state property and private property. It is assumed that such changes can help increase productivity and conservation.

However, evidence contradicts these assumptions. In fact, GHA traditional tenure systems have been dynamic and flexible. Most do not involve “tragedies” but instead have been relatively effective at resource management (Migot-Adolla and Bruce, 1994). The replacement of customary systems by private ownership for land and resources tends to reduce security, partly by creating confusion and negating existing tenure (Ridell and Dickerson, 1986; Migot-Adolla & Bruce, 1994). State ownership has often given legal power to African elites appropriating good lands. These changes can therefore lead to marginalization of local people, and reduce food and environmental security (Juma, 1996; Veit et. al., 1995; Shepherd, 1988/92).

Such problems are illustrated in Nyeri, Kianjogu, and Madu districts of Kenya, where 35 years of land titling/registration has led to land concentration, increased landlessness, and food insecurity. Here, government tenure changes vested legal rights to land in a single individuals usually restricted to male elders. This has marginalized younger males and women farmers and tends to benefit larger farm owners rather than small holders (Roth et. al., 1994). The government also established Maasai group ranches in the late 1960s and 70s, intended to allow for community organization and natural resource management. However, titling undermined pastoralists’ mobility, enforcing sedentarization and dispossession. Politically influential non-Maasai outsiders were able to gain land unfairly, and concentrate land in ways that have increased food and economic insecurity for most Maasai community members. Furthermore, overgrazing and land degradation has increased due to livestock concentrations and unsustainable agricultural expansion (Galaty et. al., 1994).

5. Institutional weaknesses, governance hierarchy, and lack of coordination

Agricultural, Development, and environment institutions tend to be weak in GHA. They seldom have capacities to mitigate or prevent the socioeconomic and environmental crises. Government institutions have been debilitated under structural adjustment policies. Agricultural research institutions tend to lack attention to resource issues and to the needs of the poor. Top-down approaches to technology transfer and promotion of uniform monocultural agriculture aggravate problems; they are not effective to meet local needs. Extension institutions and farmers seldom work well together (Thrupp, 1996). *Weakness in educational institutions* underlies the widespread illiteracy problem for the majority the population; this, in turn, underlies poverty and low productivity. Moreover, lack of education (especially for women) is a reason for high fertility levels. These weaknesses contribute to underutilization of the human resource potential. (Clinton/State, 1994)

Hierarchical and centralized institutional structures constitute another cause of problems. This includes bureaucratic institutional structures, and the continued dependency on external development/financial institutions. “The legacy of colonialism and the national focus of international development assistance have contributed to highly centralized government decision making, and....

intensive state intervention.” These factors tend to thwart democratic participation, poverty alleviation, and resource management (Veit et. al., 1995). At the same time, *lack of coordination among nations/government agencies* hinder development efforts and prevent effective resolution to transboundary problems. Although regional cooperative efforts (such as IGAD) have been established, such institutions and programs require more support and capacities to solve joint problems.

6. Demographic Factors

Demographic pressures -- including movements and people as well as growth rates -- contribute to unsustainable use of resources and food insecurities. However, population growth alone is not the main root of the problems; rather, high population growth rates are rooted in poverty and inequities, lack of economic and educational opportunities for women, and complex social customs. The massive *displacement and migrations* of millions of people from conflicts and/or environmental disruptions and their *resettlement in concentrated densities* in marginal areas, are major contributors to deterioration and famines. These pressures are particularly vivid in “critical resource areas,” which were mentioned earlier (Unruh, 1995).

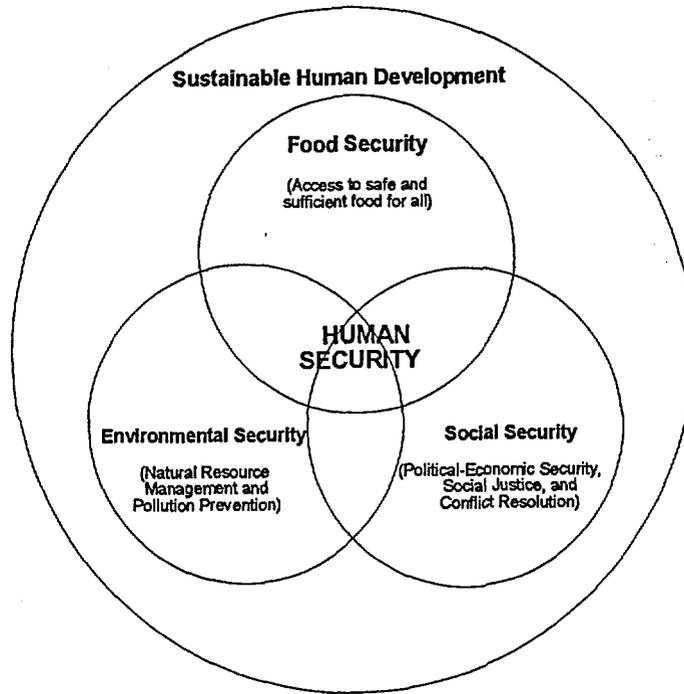
7. Ineffective Implementation of Environmental and Conservation Policies

Although well-designed environmental policies and programs are helpful and needed to increase both environmental and food security and to foment sustainable development, most of the GHA countries lack implementation capacities, and have not effectively integrated environmental measures into development policies. For example, environmental regulations affecting land use and pollution control have rarely been enforced effectively, due partly to institutional weaknesses. Sustainable farming practices have not been effectively integrated into agricultural policies. Furthermore, environmental protection programs such as parks and biological reserves in GHA have sometimes been weak in recognizing and linking to local residents’ food, economic and livelihood needs and practices. Adverse social impacts have resulted from the establishment of protected areas that prohibit peoples’ entry into traditional areas of resource use, and from resettlement programs that move local peoples from new parks onto marginal lands. They have displaced local people, forced people to use scarce resources in order to survive, and aggravated food insecurity (Blaikie, 1985; Veit et. al., 1995; Berger, 1993; Galaty et. al., 1994; Homewood and Rodgers, 1992; Miller, 1996; Peluso, 1993). On the other hand, environmental policies that *are* integrated with social development and human needs, have proven to be valuable for social and ecological purposes as discussed later. (McNeely et. al., 1994; Miller, 1996; Wells and Brandon, 1993)

8. Inherent Biophysical Constraints

It should be acknowledged that inherent biophysical factors are also underlying causes of some of the food and environmental crises in the GHA. Natural environmental constraints and events, such as droughts, floods, and soil characteristics, discussed in Part 2, are usually beyond control. But studies have shown that socioeconomic and political factors mentioned above tend to be equally or more influential causes, and determine impacts of “natural” disasters.

**Figure 11: Interlinked Objectives of Food, Environment and Social Security
in a Framework/Goal of Sustainable Human Development**



L.A. Thrupp

IV. PERSPECTIVES AND OPPORTUNITIES: PRINCIPLES AND OPTIONS FOR FOOD-ENVIRONMENTAL SECURITY IN GHA

The crises in GHA have sparked attention and reactions by numerous organizations and stakeholders, including humanitarian non-profit groups, scientific institutes, government agencies, and development/financial institutions. Many of the responses have been emergency measures and relief programs, launched as attempts to curb the suffering and starvation. While these measures have been important to offset the most serious symptoms of the crises, they are not intended to confront the roots of the problems, and they tend to be short-term efforts (e.g., Kiros, 1991, Clinton/State, 1994, UNHCR, 1996). The many stakeholders in GHA have often lacked coordination to plan and implement initiatives. It is recognized that emergency food aid projects are not enough; they need to be linked to development and policy changes that are sustained over time. One of the ultimate challenges and opportunities is to achieve interlinked goals of food security and environmental security, as part of a goal of sustainable human development in the region. This can be seen in an integrated framework, as shown in Figure 11. (See Part 1). This final section outlines strategic principles, and with actions to achieve food and environmental security. (See Box 4)

Box 4: Summary of Strategic Principles and Priority Options for Food and Environmental Security in the Greater Horn of Africa

Strategic Principles

- i. Regional Cooperation among stakeholders
- ii. Focus on key transboundary (shared) issues, particularly critical resource areas
- iii. Confront the roots of the interrelated food-environment problems
- iv. Participation and empowerment in Food and Environmental Security Initiatives
- v. Enhancing Diversity of Economic, Ecological and Social Conditions
- vi. Mobilize and strengthen initiatives for Food and Environment Security
- vii. Uphold and Build upon International Conventions on Food Security and Biodiversity

Main Types of Options and Actions for Regional Action:

1. Policy reforms (i.e., market & structural adjustment & trade policies, participatory approaches)
2. Sustainable Agriculture methods, stressing diversity and agroecological principles
3. Watershed and water resources management
4. Integrated Coastal Resources Management
5. Institutional capacity building and governance changes
6. Distributional reforms and equitable opportunities
7. Demographic Changes, through support to education/health services
8. Research and Information reforms

A. Key Strategic Principles

The following strategic principles are cross-cutting approaches for consideration by stakeholders in GHA that are interested in food-environmental security and conflict resolution. They also may be seen as criteria for helping to determine priorities among options listed in part B. They are based largely on analysis and synthesis of previous studies and experiences in the region, and country studies:

i. Regional Cooperation among stakeholders

Stakeholders in GHA will benefit by working together in partnerships to address the problems. Building cooperation among stakeholders offers an important opportunity to confront the crises at their roots, and can help in developing comprehensive “*win-win opportunities*,” for both food security and environmental security. The collaboration needs to involve the key actors at all levels, including top political government agencies, international organizations, farmer groups and local community leaders, NGOs, government extension agencies, scientific institutions, and regional bodies. Regional initiatives such as IGAD and Greater Horn of Africa Initiative are potential bases for influential regional efforts. Other useful regional efforts could include agreements for shared river basins or lake authorities, transboundary watershed management, regional programs for agrobiodiversity and soil conservation and research, reorientation of regional governance systems for water/resource, food security, improving regional trade in food (Thorshell & Harrison 1990, Little and Watts, 1996).

ii. Focus on key transboundary (shared) issues, particularly critical resource areas

Most of the critical food and environmental problems are shared by many countries of the region, and involve transboundary issues. These include watershed degradation, land/soil degradation (e.g., in grazing areas), coastal resource deterioration, and agrobiodiversity erosion. It is important to concentrate on “*critical resource areas*” --(such as watersheds, refugee concentrations or resettlement zones) where both food insecurity and environmental insecurity are very severe and where the problems tend to be common among the nations. The focus on such areas makes regional collaboration and joint planning even more logical and urgent.

iii. Confronting the roots of the interrelated food-environment problems

Treating the symptoms of problems is insufficient. Confronting the underlying causes -- largely social, economic, and political factors identified above -- is an effective and necessary way to solve problems and to sustain impacts. This means going beyond famine relief programs and food emergency projects, and instead ensuring broader development initiatives in GHA. Confronting the root causes also suggests the importance of working simultaneously on peaceful resolution of conflicts, along with food security and environmental security.

iv. Participation & Empowerment in Food and Environmental Security Initiatives

Participation, empowerment, and equitable opportunities for local people -- especially poor farmers and landless, women, and marginalized populations who are vulnerable -- is valuable in all sectors and activities, to achieve food, environment, and social security in GHA. Participation of civil society must be genuine, not only in projects for food and environmental management, but also in policy processes. Respect of rights and local knowledge, building economic opportunities, and community-based approaches are important means of empowerment. Gender equity is valuable, since women are important food producers and resource managers in GHA. Great benefits come from the full

involvement of local people in agricultural R&D and resource management, at all stages. (Lane and Pretty, 1990, Pretty et al, 1996, Sigot et al, 1995, Cleaver and Schreiber, 1995, Thrupp et al, 1994)

v. Enhancing Diversity of Economic, Ecological and Social conditions

Diversity is a valuable and essential characteristic in economic activities, ecological conditions, and in social contexts -- to reduce risk and build security and sustainability. In particular, the conservation, rational use, and enhancement of biodiversity in agriculture and in natural resources helps meet food needs and sustain production, and decrease risk. Stakeholders will gain through conservation of agrobiodiversity and reversing the erosion of such biodiversity (Miller et al, 1995, Thrupp, 1997). At the same time, diversification of economic activities -- through small rural industries, agricultural processing capacities, and agriculture, livestock, and fisheries programs -- is also needed and valuable to reduce vulnerability, as well as generate jobs and income (Jaffee, 1992, Cleaver and Schreiber, 1994). Social/ethnic diversity also must be fully respected and enhanced in peaceful ways, to ensure cooperation and equitable development among all peoples.

vi. Mobilizing and strengthening initiatives for Food and Environment Security

Although the people and institutions of the region have suffered tremendous difficulties, the human resources, knowledge, and experience of GHA people are valuable for helping to reverse the spiral of insecurity. In all actions and policy changes, it is vital to revitalize, harness, and build up indigenous strengths and knowledge. For example, local communities' coping strategies for farming and pastoral management, particularly their use of biodiversity and ecological methods in farming systems, are important capacities that can be effectively integrated into sustainable agriculture (Richards, 1985). Similarly, the abundant existing biophysical resources in GHA, particularly the water, energy, and land resources that are still untapped, need to be managed more effectively to achieve sustainable development goals (Hutchinson et al, 1991).

vii. Uphold and Build upon International Conventions on Food Security & Biodiversity

Finally, the stakeholders can benefit by using the guidelines of international agreements and recommendations of recent global and regional Conventions concerning food and environment. Historical international treaties on Human Rights (1948) and for African Conservation (1968) provide important bases for supporting actions for social and environmental security. Recently, the 1996 World Food Summit, the Convention on Biodiversity, and the Convention to Combat Desertification provide global mandates and guidelines for all countries and institutions to develop effective solutions to food and environmental problems, as noted in Box 5. Most of the countries of the GHA country governments signed these conventions, meaning that they are obligated to carry out the mandates. (Many of these guidelines coincide with principles in this report).

In sum, the above general principles can be useful as general guidelines and strategic options for consideration by the stakeholders in the region. They are relevant to a wide array of policies, sectors and institutions. Such principles can be used as criteria to establish priorities, when considering options and actions, such as those that are summarized in the following section.

Box 5: Summary of Global Conventions with guidelines concerning food-environment

A. World Food Summit Plan of Action - Commitments and Objectives for World Food Security -

1. Social and economic environment to eradicate hunger and for durable peace
 - a. Prevent and resolve conflicts peacefully and create stable democracies; b. Ensure gender equality
 - c. Promote private, public, individual, and collective efforts for sustainable development
2. Eradicate poverty and inequality, improving physical and economic access by all
 - a. Poverty eradication and employment opportunities in rural areas
 - b. Ensure safe food supplies and use traditional crops; c. Promote education & health for all,
3. Develop Participatory Sustainable agriculture, fisheries, and forestry
 - a. Intensified and diversified food systems and technologies for food security
 - b. Combat environmental threats to food security, through integrated approaches
4. Ensure food and agricultural trade that is conducive to food security through fair trade
5. Prevent and be prepared for natural disasters and man-made emergencies;
6. Optimal allocation of public and private investments for food security

B. Convention on Biological Diversity - Third Conference of Parties 1996

Recommendations concerning Agricultural Biodiversity (summarized from Convention Draft Decision adopted by the Conference of Parties UNEP/CBD/COP/3/L12) include the following:

1. Identify key components of biological diversity in agricultural production systems
2. Internalize environmental costs
3. Implement incentive measures which have positive impacts on agrobiodiversity, to enhance sustainable agriculture
4. Encourage the development of technologies and practices that increase productivity and arrest degradation
5. Empower indigenous/local communities & build in situ conservation and sustainable use of agrobiodiversity
6. Encourage evaluation of impacts on biodiversity from agricultural development projects
7. Integrate with programs/plans related to marine, coastal, and freshwater ecosystems
8. Promote partnerships with researchers, extension workers, and farmers for agrobiodiversity,
9. Promote appropriate research and services for farmers, with genuine partnerships
10. Promote R&D on Integrated Pest Management, particularly methods that maintain biodiversity
11. Encourage regulations or measures to encourage appropriate use of agrochemicals
12. Study and use methods/indicators to monitor impacts of projects on agrobiodiversity
13. Study the positive and negative impacts of intensification on ecosystems and biomes

C. Convention to Combat Desertification – Commitments and Objectives for Africa

Articles and recommendations of the Convention including the Regional Annex for Africa:

1. Prevent and/or reduce land degradation in arid, semi-arid and dry sub-humid areas
2. Rehabilitate partly degraded land and reclaim desertified land
3. Adopt national and regional action programmes based on:
 - a. poverty eradication as a central strategy and strengthening of food security, storage and marketing
 - b. integrated, partnership and bottom-up approaches with the participation of local people
 - c. diversifying agriculture and dryland farming systems
5. Develop measures to conserve and manage natural resources
6. Improve knowledge of desertification and support public education & scientific research cooperation
7. Inventory, protect and validate traditional local knowledge, know-how and practices
8. Monitor and assess desertification, drought and ecological degradation and strengthen early warning

Sources: Short summaries/abstracts extracted from international arrangements by WRI

B. Options and Opportunities for Regional Action

While the above broad strategic principles provide general guidance, more specific strategic options and “win-win” opportunities need to be seriously considered and implemented by stakeholders in the region, in order to overcome the interrelated food, environmental, and social crises. The people of GHA can benefit, and progress can be made toward human security, if such changes are developed in a collaborative way. Regional approaches will be valuable for this purpose. The main strategic options for consideration, summarized below, have been identified through an extensive review of studies, country reports, interviews, and information from the region.

1. Policy Reforms

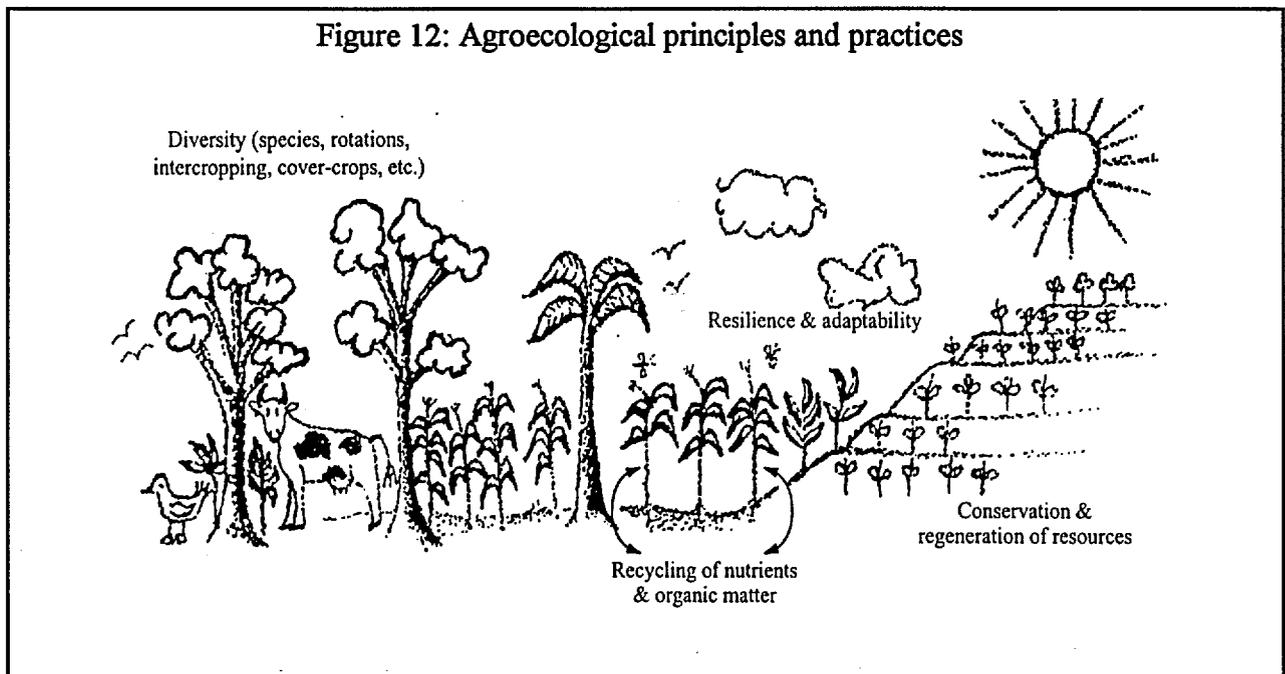
- a. *Reforms of Market, Pricing, Credit policies, and Structural Adjustment provisions*
 - Policy support to R&D on alternative agroecological production methods;
 - Agricultural Credit and marketing policies that ensure the poor have access to food;
 - Retracting incentives/pricing policies for use of land that is unsuited for production;
 - Retracting subsidies to agrochemicals which induce overuse;
- b. *Structural Adjustment reforms to alleviate pressures on the poor and enable social investment*
 - Investments in essential social services, education and food needs
 - Integration of environmental provisions into economic production policies
- c. *Trade policy reforms that contribute to food-environmental security and fair trade*
 - Utilize opportunities of global international and regional trade agreements
 - Integrate provisions for environmental management into trade/market development
 - Meet food import needs, taking into account food consumption of vulnerable groups
- d. *Democratic, participatory approaches for policy-making, ensuring participation of civil society in deciding policies and actions.* Recent assessments suggest that local people must be involved in all phases of design, implementation and evaluation of programs. Policies should be designed with special attention paid to who benefits and how (Miller et. al. 1995)
- e. *Agricultural development/settlement policies*
 - Ceasing settlement/colonization policies that induce people onto marginal frontier lands
 - Changing land use policies to avoid use of marginal land and to secure tenure for poor

2. Watershed and Water Resources Management

Integrated approaches to manage watersheds are essential and beneficial ways to address and alleviate the serious watershed degradation and food insecurity that affects the resources and people in the major lake and river areas of GHA. This requires a combination of soil conservation and agroecological practices (see point 3 below), reforestation, agroforestry, water pollution control methods, and comprehensive resource conservation in areas of dam construction. Efforts should be concentrated on the watersheds, such as the Nile and Lake Victoria regions, that are most critically degraded and where people are suffering from food insecurity. This integrated approach to watershed management requires collaboration among multiple stakeholders, ranging from the resource users and communities, to national ministries and regional bodies such as IGAD and donor agencies.

3. Sustainable Agriculture Methods, stressing agroecology, diversity, and soil conservation

The development of sustainable agriculture practices is a central recommendation by numerous analysts and organizations. This means the development of participatory agroecological methods, based largely on bio-intensive approaches and biodiversity in integrated food systems, which are needed in watershed areas and in other agroecosystems. The approach suggests *sustainable intensification*, which refers to efficient and rational use of resources for increased agricultural productivity, without degrading the resource base. It also implies enhancing diversity and resilience in farming systems, based on agroecological principles (See Figure 12) (Altieri, 1990, Rosegrant and Livernash, 1996, IED, 1996, World Bank, 1996, Thrupp, 1996, Reardon and Shaikh, 1995, CBD, 1996). This does not suggest abandoning "extensive" management such as sustainable livestock systems, but should avoid conventional intensification that consists of heavy use of pesticides and uniform monocultural systems.



Proven effective principles and practices for sustainable agriculture include the following:

a. Agrobiodiversity conservation and enhancement

- conservation of conserve diversity of crop and livestock varieties, and diverse agroecosystems, mainly through in situ conservation, support of mixed/multiple cropping systems, and use of integrated crop/pest/soil management methods and agroforestry;
- revitalization of useful indigenous landraces and knowledge on diversity in agroecosystems
- development of community-based seed banks, community involvement and leadership in research on agrobiodiversity, and benefit-sharing schemes for genetic resources

Many studies and experiences in GHA have shown great benefits from the conservation and enhancement of plant genetic resources (Montecinos, 1994, 1992, McNeely et al, 1994, McNeely, 1990, Thrupp, 1996, Mooney, 1992, UNDP/GEF, 1994, Shigeta, 1990). (See Box 6)

b. Soil conservation/fertility management, particularly bio-intensive and regenerative methods for nutrient management – including cover crops, minimum tillage, mulches, manures, intercropping, and terracing. Soil conservation measures have been proven to increase yields some 20-40 percent in GHA countries. (Hutchinson et al, 1991, Cleaver and Schreiber, 1994, Reardon and Shaikh, 1995)

- c. *Integrated Pest Management methods* that are ecologically oriented and farmer-driven, and well adapted to local needs and conditions (Thrupp, 1996);
- d. *Agroforestry development*, stressing the integration of indigenous trees into farming systems, and development of community tree nurseries, with involvement of local people.
- e. *Sustainable pasture/livestock and fisheries management*, building on traditional pastoralists' livestock management practices that have been sustainable and effective.
- f. *Water conservation and water management methods* (including small-scale irrigation systems) to help reduce risks of droughts and stabilize supplies.

These principles and approaches to sustainable agriculture and agrobiodiversity conservation have proven successful to meet food needs, increase productivity, while avoiding environmental degradation in GHA (Pretty et al, 1996, Lane and Pretty, 1991, Thrupp, 1996). Much more work is needed to ensure wider development and diffusion, through participatory methods. (See Box 6)

BOX 6: Recent Efforts to Conserve and Enhance Agrobiodiversity in GHA

Fortunately, the conservation of Ethiopian landraces *in situ* (on farm) is being supported by an innovative GEF/UNDP project in cooperation with the Ethiopian Ministry of Natural Resources and Environmental Protection, the Biodiversity Institute (a government research center) and Seeds for Survival (an NGO). This project helps to conserve indigenous grasses, legumes and food crops on farms with the participation of farmers and the formation of community seed banks (GEF/UNDP 1994, Worede, 1992). It supplements classical *ex situ* conservation in genebanks.

Similarly, an NGO in Kenya called KENGO is coordinating a broad attempt to increase nutrition and reverse genetic erosion in indigenous trees and food crops, particularly vegetables. Started in 1985, this effort is undertaken by a coalition of Kenyan institutions (College of Agriculture Kenyatta University, University of Nairobi, Kenya Industrial Research Institute (KIRI), KENGO), and farmers and women's groups (Olembo, Lake Victoria and Nyamvera). Forty seed collectors have been trained, to 700 kg of indigenous seeds have been procured and distributed to over 400 destinations, and field genebanks have been supported. A nursery with over 2900 specimens of 86 economically important indigenous trees has been created with Kenyatta University. KIRI research results suggest that fruits from *Andansonia digitata* and *Gynanfrospis gynandra* contain higher nutritional qualities than introduced vegetables (Kiambi & Opolo, 1992).

4. Coastal Resource Management

Coastal resources also deserve attention and work, since they are critical transboundary zones in the GHA, where people are threatened by food and environmental security. Coastal and marine fisheries need to be more carefully managed, regulated, and conserved, through cross-boundary regional agreements, to avoid continued depletion and scarcities. Integrated coastal zone management (ICZM) efforts have proven effective and are urgently needed in the GHA region, using collaborative approaches. The efforts need to involve multiple nations and actors who share coastal waters, fisheries, and other resources. Pollution and effluents, as well as industrial and tourism development, need to be better managed and controlled. Such measures will help ensure more sustainable economic growth, as well as protecting the vitality of resources and public interests of local people.

5. Institutional capacity-building and Governance reforms

- a. *Improvement of institutional capacities* at the regional, national and international levels, for sustainable agriculture/environmental management; this includes:
 - staff training and education, increasing funding for cooperation on resource management;
 - ceasing programs that perpetuate inappropriate technologies such as pesticide reliance.
- b. *Decentralization of management* and institutional structures, and devolve decision-making to local areas in many cases, to reverse the top-down hierarchies in centralized bureaucracies:
- c. *Building and supporting community organizations* and NGOs, including farmers associations, women's groups, for developing local community-based capacity for food security and environmental management (Veit et al, 1995, Reardon and Shaikh, 1995, Mascarenas, 1994)
- d. *Integrate participatory approaches* and community based approaches in institutional structures and programs, for resource management and food production, to ensure involvement of the public.
- e. *Capacities and mechanisms for conflict resolution*, to resolve resource disputes and curtail/prevent conflicts that undermine food production, economic welfare, and resources in GHA.
- f. *Prohibitions and sanctions against corruption*, and enforcement through international and regional bodies; and incentives for leaders that promote peace and democracy.
- g. *Legislation of reforms in governance*, to develop more decentralized structures, democratic decision-making, participatory processes, respect of human rights, and capacities for democratic governance; and implementation and monitoring by international and regional agencies.

BOX 7: Successful Sustainable Agriculture Practices and Resource Management in GHA

In the semi-arid Machakos district in southeastern Kenya, the agricultural, technological and resource management achievements and practices of Akamba agropastoralist smallholders over six decades have resulted in increased productivity and environmental conservation, even with high population growth. At the same time, in spite of climatic constraints, the people worked to prevent resource degradation and to maintain soil fertility and food security, through community activities on resources. Women join in *mwethya work* parties (backed by leadership of village leaders) to make locally adapted *finyaa juu* terraces, cutoff drains and gully dams. Of the 8,500 km of terrace constructions between 1981-1985, more than half were the result of unassisted efforts of farmers. According to aerial photos, about 54% of the district's arable land was adequately conserved. Akamba farmers also introduced faster oxen tillage, increased manuring and experimented with staple food options, agroforestry and crop varieties. (They did not replace local cultivars by modern wheat, maize and rice varieties for marginal areas, but supplemented them with the drought tolerant maize). Thus, land degradation with population increase has not occurred; and the predictions of food and fuelwood scarcities have not come true (Mortimore & Tiffen 1994, Veit et. al., 1995).

In Rwanda and Uganda, rural people in densely populated areas of Buberuka and Ruhengeri highlands and plateaus and the Kisoro district, have also adopted soil conservation and sustainable agricultural intensification practices, as a response to cope with deforestation, decreased farm size and soil erosion. Rwandan farmers in this area now plant more trees/shrubs and have increased their use of mulches on cash crops, and terraces on steep slopes. They also use compost, ditches to channel water, grass contouring, crop residue manuring, minimum tillage and the planting of trees and shrubs. (Ndiaye and Sofranko, 1994, Veit et. al., 1995).

In Sudan's Central Butan region, Shukriya traditional resource management systems were undermined by postcolonial councils of authority, leading to loss of communal pasture management, and disruption of farming systems. In response, the communities have restored community range management and communal property in arid Sadda and Um Sahra areas. Local councils with Shukriya community leaders are regulating pasture use, demarcating ranges, reviving grazing schedules, communal water resource conservation and ensuring the report and resolution of conflicts and offenses to tribal leaders and the local council (Veit. et al., 1995).

6. Distributional Reforms and Building Equitable Opportunities

Distributional reforms may also be needed in some areas to overcome highly inequitable patterns of development and land use; such changes can bring multiple benefits. Focusing on economic growth and market liberalization is insufficient to bring about socio-economic development and recuperation; distributional matters must be given attention for land use, tenure security, access to technology and to markets, extension and educational services, and income opportunities. Useful measures include:

- a. *Tenure policy reforms for natural resource systems* (affecting land, pastures, water, etc.)
 - Legal tenure reforms, to ensure secure tenure for the poor, especially for marginalized people; and transfer rights of tenure management to local authorities and communities (Toulmin, 1991, Cleaver and Schreiber, 1994, Reardon and Shaikh, 1994, Juma, 1996).
 - Respect of customary tenure law, that build upon indigenous systems; and develop local capacities to enforce indigenous rights, legitimizing traditional patterns of local management that enable sound resource use and food security (Juma, 1996, Toulmin, 1991, Shepard, 1992)
 - Where politically possible, land reform in selected areas, to dismantle inequitable structures of land holding formed by centralized governments and by unfair co-optation of traditional entitlement, and to ensure land access/opportunities for the poor (McNeely, et. al., 1995)
- b. *Improved market/food distribution systems*, partly through increased infrastructure and market access to remote areas, and also through appropriate market/pricing policies;
- c. *Protect legal Rights for equitable opportunities* to jobs, education, and access to health/social services, by strengthening programs for jobs, schools, social services, to improve food access.

If such equitable structures are established, and if the poor gain opportunities, the overall food situation and environmental conditions are likely to be improved more effectively.

7. Demographic Changes, and support of education on reproductive health

Stemming demographic pressures requires serious attention to both migration/settlement patterns, and population growth. Reversing the flows and concentrations of refugees and other displaced persons requires resolving political and economic crises in conflict-ridden areas, as noted previously, as well as investment in sustainable rural development programs. Effective measures include:

- a. *Focus on refugee/settlement areas* of dense population, for rural/health development initiatives.
- b. *Investments and support for education*, particularly for women on reproductive health issues. Many studies have proven that the increase in women's education and income leads to improved economic welfare, and also to lower fertility rates (World Bank, 1992). People also need to have assured access to adequate health services regarding reproductive rights. Such changes can have a major influence on alleviating population pressures.

8. Research and Information Challenges:

Further information is needed on environmental trends and food production/consumption issues in the GHA. Although aggregate estimates are available on many factors in the region, disaggregated data are needed on resources, demographic changes, food/agriculture, and other socioeconomic and biophysical information.

- a. *Data to identify the main "critical resource areas"* of severe environmental degradation and famine, and similarly, to identify the most vulnerable groups. For this purpose, locally disaggregated data and refugee data can be useful.

- b. *Spread information on monitoring and warning systems* on the resource and food changes over time. Such information can be very useful to decision-makers, regional and international agencies, as well as local people, to ensure that it can be used for reforms. (Build on existing FEWS data)
 - The use of Geographic Information Systems can be valuable for these information needs. While some GIS studies have already been done (e.g., Corbett, 1995), such data can be updated and used and made accessible widely for decision-making.
- c. *More research and information exchange on sustainable agriculture* approaches for GHA, particularly methods for sustainable intensification and agrobiodiversity. Such research should be participatory and should build upon and adapt practices in GHA.
- e. *More research on links of causality* between food insecurity, environmental stress, and political conflict, to clarify and systematize such linkages in case studies.

C. Reflections on Priority-Setting and Regional Opportunities

Within GHA, each country may have varying priority concerns and preferred approaches. Yet, it makes sense for the countries to cooperate -- to focus on urgent problems and critical areas of mutual concern, and to select priority strategies to achieve food security, environmental security, and social security. This approach helps to build on opportunities and advantages of working jointly on problem-solving. To agree on top priorities for the region, it **useful** and perhaps essential to develop *a participatory process of strategic decision-making with stakeholders, including local communities*, to ensure that representatives in all sectors and interest groups are involved in setting priorities. The criteria mentioned in Section IVA may be helpful in this effort.

In sum, the integration of social, economic, and environmental dimensions is key to overcoming hunger and resource degradation. The roots of the problems -- including socioeconomic and political instability, skewed policies and the inequitable/unsustainable patterns of development, and institutional weakness -- cannot be ignored. Serious commitments among regional stakeholders to work jointly on these sustainable development approaches can provide hope for this region to achieve food and environmental and social security in the region.

NOTE:

Comments on this discussion paper are welcome. For further information or to send comments, draft, please contact: Lori Ann Thrupp, Director of Sustainable Agriculture, Center for International Development and Environment, the World Resources Institute, 1709 New York Ave, NW, Washington, DC. 20006, USA. Fax 202-638-0036. E-mail: ann@wri.org.

Appendix 1: Food Security and the Environment in the Greater Horn of Africa: Stakeholder Analysis and Dialogue

Description of a joint project by WRI and IUCN 1996-98

The Challenge

The Greater Horn of Africa (consisting of Eritrea, Ethiopia, Sudan, Djibouti, Somalia, Kenya, Uganda, Rwanda, Burundi, and Tanzania) remains a region in crisis, facing pervasive problems of food insecurity and famine susceptibility, civil unrest, internal displacement of millions of people. In addition, the natural resource base has become severely degraded, which undermines food production and aggravates hunger problems in the short and long term. The role of environmental issues is a key aspect that needs to be incorporated in any initiative addressing the root causes of food insecurity, instability, and poverty in the region. Further, regional and institutional cooperation on food-security environment linkages may help to understand and ameliorate conflicts and crises in the region.

Goals, Objectives, and Opportunities

In response to this challenge, the World Conservation Union's East African Office (IUCN-EARO) and the World Resources Institute (WRI), in collaboration with other African institutions, are facilitating a stakeholder analysis and dialogue on Food Security and Environment in the Greater Horn of Africa. This project is supported by the Agricultural and Natural Resources Division of USAID-REDSO. The goal of this stakeholder analysis/dialogue will be to identify key concerns in the food security/environment nexus and strategic options in agreement with key African organizations and individuals working in the region. The main objectives of this project are to:

- (i) develop a better understanding of the causal linkages and relationships between food security and environment;
- (ii) identify the principal stakeholders, including key regional and national public and private institutions and individuals, who affect and are interested in food security/environment issues;
- (iii) identify regional food security/environment issues, needs and ongoing initiatives; and
- (iv) identify priority options and possible approaches to addressing regional food security and environmental concerns for the Greater Horn of Africa.

The results of this project could therefore inform and benefit ongoing and future regional natural resource programs in Africa, including those of USAID as well as larger food security and conflict resolution programs such as the Great Horn of Africa Initiative (GHAI).

Strategy and Activities

A. Background information-gathering, analysis, and synthesis

Drawing on existing information and efforts in the region, WRI is preparing a background discussion paper that will highlight the relationship between food security, natural resources and environmental management in the region. IUCN is coordinating efforts of local researchers to identify key institutions and programs working in this field, as well as information that such institutions have available on food security-environmental issues.

B. Collaborative Stakeholder workshop

Working with African-based collaborators, a workshop is planned for October 1997 to bring together key stakeholders in the Greater Horn to discuss the background paper(s), prioritize regional issues, common perspectives, needs and strategic options in this field. IUCN will be taking the lead in facilitating the workshop; and the plans for the workshop will also benefit from advice of an Informal Advisory Group and other institutions in the region. Stakeholders to be invited to participate in the

process will include national government agencies dealing with natural resources and agriculture; government research institutes and university departments, such as the Plant Genetic Resources Institute/Ethiopia; and international, regional and public bodies/agencies.

C. Follow-up and Outreach

WRI and IUCN (and others involved) will inform institutions and policy makers about the results and recommendations of the workshop; and the information from this activity will be useful as a foundation to build and complement initiatives in the region on the food security-environment nexus, such as activities planned by UNECA, UNSO, IGAD, REDSO and other international, regional, and national organizations. The participation of the groups involved in the workshop will be useful for planning and implementation of future activities in the region.

Anticipated Outcomes and Outputs

1. Food Security and Environment Background Paper and Country Studies:

WRI's background paper supplemented by an annotated bibliography and country analyses of stakeholders will address the food security-environment linkages that are not as well known in many initiatives in GHA. Although there is literature available on agriculture, environment, and food security issues, a concise synthesis will be helpful to analysts and decision makers. The paper will clarify causal links between hunger and environmental degradation, social and political security, drought, soil degradation, deforestation, tenure conditions, environmental refugees, and agrobiodiversity. It will provide principles and suggested options to help solve problems and to achieve environmental/food security. The discussion and critique of this paper (by local people) will help to increase understanding and to formulate options. In addition, African collaborators are conducting studies and preparing country reports for Kenya, Tanzania, Somalia, Eritrea, and Ethiopia. These countries have been selected on the basis of past experience, ongoing activities, availability of information on key issues, and sharing of common resources.

2. Stakeholder Dialogue Workshop and Strategic Options:

The workshop will facilitate dialogue around issues raised by stakeholders and the background papers. Workshop discussions will identify dominant positions and common perspectives of key stakeholders which will help to develop a strategy and options for action on food security and environment priorities in the Greater Horn. The group will also identify a set of criteria to define/identify effective regional actions and policies to integrate environmental management into agricultural and development initiatives that improve food security and meet critical needs.

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**List of Papers prepared by WRI, IUCN-EARO and Collaborators:
Country and Regional Information and Stakeholders
in the Greater Horn of Africa**

WRI:

Thrupp, LA, July 1997. *Critical Links: Food Security and the Environment in the Greater Horn of Africa*, World Resources Institute.

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* The above papers have been prepared for the Food Security-Environment Stakeholder project, and are available through the IUCN- EARO office, Nairobi, or through WRI, in Washington, DC.

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