ENVIRONMENTAL SECURITY IN THE IGAD REGION: AN APPROACH FOR BUILDING SUSTAINABLE DEVELOPMENT AND PEACE

Workshop Report

A Joint Workshop Organized by the Intergovernmental Authority on Development (IGAD) and the Foundation for Environmental Security and Sustainability (FESS)

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Addis Ababa, Ethiopia

I. ORGANIZATIONAL STRUCTURE OF THE WORKSHOP

From May 5, 2009 through May 7, 2009, the Intergovernmental Authority on Development (IGAD) and the Foundation for Environmental Security and Sustainability (FESS) conducted a joint workshop entitled *Environmental Security in the IGAD Region: An Approach for Building Sustainable Development and Peace*. The workshop was the first major cooperative effort toward implementing the Memorandum of Understanding (MoU) that IGAD and FESS signed in May 2008. The workshop was held in Addis Ababa, Ethiopia and was supported by core funding from the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). Nearly 35 official representatives from Djibouti, Ethiopia, Kenya, Somalia, Sudan, and Uganda were in attendance, as well as approximately 20 representatives from the development and academic communities, IGAD, and FESS.

The objectives of the workshop were to:

- Increase awareness of the linkages among environmental change, vulnerability, poverty, instability, and conflict
- Identify and discuss environmental risks to development, peace, security, and stability in the IGAD region
- Review environmental security assessment methodologies and consider applications of such methodologies in the IGAD region

Prior to the workshop, seven analytical and policy-oriented papers were prepared by experts from the IGAD region.[1] The papers addressed a wide range of issues related to environmental security, including:

- Food security
- Energy
- Water resources
- Pastoralism
- Economic cooperation and integration
- Mineral and forest resources
- Climate change

The workshop was divided into 10 sessions, with a presentation covering each of the 7 environmental security issue areas. Representatives from IGAD served as overall facilitators for the workshop and gave presentations on the development of IGAD's mission and its current role in the region, as well as the draft IGAD Peace and Security Strategy. FESS presented an overview of the environmental security paradigm, environmental security's applicability to the African context, and an introduction to its Environmental Security Assessment Framework (ESAF). Discussion among the participants and presenter followed each presentation. During the last session of the workshop, attendees split into three small groups to discuss the topics addressed and share ideas on recommendations. The small groups were divided among the issues of 1) environmental security and conflict early warning, management, and peacebuilding; 2) environmental security and livelihoods, minerals, and timber; and 3) environmental security and

[1] A complete set of workshop papers is available via email request to info@fess-global.org.

economic cooperation, transboundary resource management, and economic diversification. The small groups were asked to identify sources of vulnerability and potential conflict triggers, as well as to make recommendations in the areas of capacity building, policy integration, and development planning.

Participating organizations and institutions included:

Djibouti
Ministère de l'Agriculture, de l'Elevage et de la Mer Chargé des Ressources Hydrauliques
Direction de l'Aménagement du Territoire et de l'Environnement
Ministère de l'Energie et des Ressources Naturelles
Ministère de l'Economie, des Finances et de la Planification

Ethiopia
Environmental Protection Authority
Ministry of Mines and Energy
Ministry of Agriculture and Rural Development
Ministry of Water Resources
Ministry of Finance and Economic Development
Amhara National Regional State

Kenya
Ministry of Environment and Mineral Resources
Ministry of Foreign Affairs
Ministry of Planning
Ministry of Energy
Ministry of Water and Irrigation
Ministry of Agriculture
Rural Planning Directorate, National Development and Vision 2030

Somalia
Ministry of Foreign Affairs
Ministry of Agriculture
Ministry of Petroleum & Energy
Ministry of Environment
Ministry of Water & Natural Resources

Sudan
Ministry of Energy and Mining
Ministry of Irrigation and Water Resources
Ministry of Finance and National Economy
Higher Council for Environment and Natural Resources

Uganda
Ministry of Water and Environment
Ministry of Agriculture, Animal Industry and Fisheries

National Environment Management Authority
Ministry of Energy and Mineral Development

International, Regional, Bilateral Organizations
Food Security and Sustainable Development Division, UN Economic Commission for Africa
Eastern Africa Office, UN Economic Commission for Africa
Nile Basin Initiative, Khartoum, Sudan
Embassy of the Kingdom of the Netherlands

Non-Governmental Organizations
Horn of Africa Regional Environment Centre
Organisation for Rehabilitation and Development in Amhara

II. EXECUTIVE SUMMARY

Environmental Security and the African Context

In natural resource dependent countries like those of the IGAD region, stability and well-being depend in large part on the effective management, utilization, and governance of natural resources such as land, water, forests, and minerals. When natural resources are misused, conditions of scarcity intensify, and they create problems that threaten livelihoods, prolong poverty, spur forced migration, and exacerbate the effects of natural hazards. Threats to natural resources weaken economies and make populations more vulnerable, raising the potential for political, social, and economic instability. Under these conditions, unresponsive or ineffective governance can contribute to hardship and unrest that erodes society's fabric and fuels the precursors to violence.

Environmental problems are rarely the singular cause of conflict, and every conflict has its own specific social and political history, but land degradation and fragmentation, scarcity of water and pasture, shrinking supplies of fuelwood, and the effects of droughts and floods all have contributed to conflict across Africa and within the IGAD region. In some African countries, it has been the mismanagement of resource abundance—especially minerals and timber—that has triggered or contributed to violence. With an arid and semi-arid natural environment that is susceptible to natural hazards, the IGAD region already experiences high levels of environmental insecurity, and global climate change threatens to intensify these conditions in the years ahead.

For these reasons, there is a strong need to explore threats to environmental security in the Greater Horn of Africa and to increase the requisite knowledge, capacity, and policy options necessary for enhancing human security and managing and mitigating conflict.

Water Resources: Scarcity and Environmental Insecurity

Water scarcity is a serious problem in much of the IGAD region, and population growth, urbanization, and industrialization is likely to worsen the situation. In combination with already difficult living conditions, water scarcity may lead to heightened tensions and conflict. Water, moreover, is a resource that can generate conflict across borders. Data on water availability in the IGAD countries are often misleading, and knowledge of ways to capture and store water is still limited in the countryside. National strategies for water and sanitation improvements need to

be implemented, along with the allocation of financial resources. Greater research into water availability is needed, especially with respect to groundwater and rates of recharge.

More coordination across water basins is needed, and regional conflict resolution mechanisms need strengthening. The Nile Basin Initiative shows that transboundary water management proceeds slowly and incrementally, thus IGAD might consider establishing a water platform to bridge gaps in the region.

Environmental Security and Food Security

Poverty and food insecurity are linked to environmental insecurity. Deforestation contributes to soil erosion, a reduction in land fertility, and declining crop yields. With a heavy reliance on rainfed agriculture in much of the IGAD region, drought can produce devastating effects. Decreasing per capita cultivated land, land tenure issues, and poorly maintained land contribute to food insecurity. In some areas, invasive species and pests have reduced food production.

A variety of interventions are needed, including the promotion of off-farm livelihoods, especially in drought prone areas; investment in the restoration of ecosystem services; and incentives for protection of key environmental resources. Similarly, there is a need to improve the capacity of food producers in poor areas to manage soil and water conditions and maintain biological diversity. Central to these measures is the need to empower communities and integrate environmental security considerations into national food policies

Pastoralists and Environmental Insecurity

The so-called lowlands, rangelands, or arid and semi-arid lands are the cradle of pastoralism, an important livelihood and way of life for more than 25 million people who are engaged in pastoralism on lands that cover 60 percent of the total IGAD area. The environmental security of pastoralists is endangered by recurrent droughts, water and pasture shortages, land degradation, invasive vegetal species, population growth, agricultural expansion, sedentarization, lack of health and educational facilities, and national and transboundary conflicts. Climate change effects represent perhaps the most important threats for pastoralists and pastoralism in the future.

Small-scale farmers and pastoralists who compete for resources often come into conflict. Pastoralists have been viewed as intruding on agricultural land, but are also victims themselves. In the last decade, the loss of land has led to declining productivity and the need for more land for sedentary farming. This increase in land for farming has blocked natural routes for pastoralists, threatening their livelihoods.

There is a need for a broad and integrated approach to address the challenges faced by the pastoralist way of life and consequent resource-based conflicts. An environmental security-based approach may be a way forward given the multidimensional social, economic, cultural, and environmental nature of the issue. IGAD programs such as CEWARN, ICPAC, CBNRM, and LPI are addressing aspects of the problem, but more analysis needs to be done to better understand the linkages between pastoralism and environmental insecurity and conflict.

Global Climate Change: Threats to Human Security and the Potential for Conflict
The IGAD region is one of the regions of the world most severely affected by climate change and variability. Recurrent drought has altered the biophysical and socioeconomic landscape of the region during the past four decades. Impacts of drought on human security include famine and migration. There are a variety of associated factors that make the region especially vulnerable to the projected effects of climate change, including population growth, poverty, rainfed agriculture, food insecurity, health problems, and low technology.

The situation in the Darfur region of Sudan reflects the complex interaction of factors that can produce environmentally linked conflict under the stresses produced by climate change. Climate variability has had negative impacts on water availability and the productivity of subsistence crops. The population's livelihoods depend on natural resources, and there are inter-tribal tensions. The nomadic system has been under pressure due to declining rainfall and loss of traditional routes. These factors have intertwined with a lack of security, changing social structures, land tenure disputes, and rising tensions between resource users. Violence in Darfur is causing the further deterioration of natural resources.

Just as multiple factors were involved in creating conflict in Darfur, a comprehensive approach to peacebuilding is required, including the creation of mutual understanding and reconciliation, and the building of human, social, and natural capital. Problems that are partly resource-based need partly resource-based solutions. More generally, there is a need for more scientific knowledge to clarify and better understand the links between climate change and the potential for conflict throughout the Greater Horn of Africa.

Environmental Security and Regional Integration in the IGAD Region
Environmental security has the potential to contribute to economic cooperation and regional integration through helping to improve livelihoods, increase production and income, expand markets, and encourage investment. The IGAD region has numerous shared natural resources, and proper integration between member states will be critical for their effective management. Lake Victoria, which is important for fishing, domestic water withdrawal, industry, and other uses in Kenya and Uganda, is one major example. The use of the waters of the Nile is another.

Environmental issues already have had a major impact on the IGAD region. There have been mass displacements of populations due to water scarcity, agricultural land shortage, fuelwood needs, and depletion of grazing and other resources. Inter-ethnic conflicts have erupted as a result of spontaneous movements of people from one region moving into neighboring regions caused by land and other resource depletion. These challenges require a variety of institutional partners, a proper legal framework, capacity building, and enforcement mechanisms.

Building trust and ownership is essential to overcoming longstanding mistrust in participating states. Adopting a gradual approach in implementing regional agreements on joint environmental management could restore confidence, while promoting outreach and communication. This could support the efforts of IGAD countries to harmonize policies more broadly, including those related to trade, customs, transport, energy, communications, and agriculture.

An Approach to Environmental Security Assessment: The FESS ESAF Methodology
FESS's Environmental Security Assessment Framework (ESAF) is one example of methodologies for conducting environmental security assessments. The ESAF examines key environmental variables such as land use, water quality, deforestation, and natural hazards, and places them in the broader context of reciprocal linkages with political, economic, social, historical, and cultural factors. The ESAF process attempts to develop a detailed understanding of how specific environmental problems in specific situations are contributing to vulnerability, instability, insecurity, or conflict.

The goals of the ESAF are to inform policymakers and stakeholders, facilitate the establishment of clear priorities, and contribute to the development of effective and sustainable policies, programs, and actions. In addition to interviews with government officials and nongovernmental experts, FESS engages with communities and seeks to get their input as a means of determining the root causes of environmental security problems. The ESAF has neither a narrow focus on specific projects like environmental impact assessments (EIAs) nor a broad focus on the entire array of environmental factors relevant for government-wide policies like strategic environmental assessments (SEAs). Instead, with the goal of averting instability and conflict, the ESAF examines how environmental change and the use or misuse of natural resources may threaten human security and stability in nations and communities.

In view of the environmental security challenges in the IGAD region, there is a need for the development of the capacity of member states to conduct environmental security assessments. These should be able to incorporate valuation and quantification to put forward clear and effective recommendations to policymakers. Recommendations also should be consonant with national development strategies.

Energy, Livelihoods, and Environmental Security
Over 90 percent of households in the IGAD region depend on traditional biomass energy. This heavy reliance on traditional biomass has exacerbated deforestation and land degradation. Indoor combustion has contributed to widespread respiratory infections. End-use energy efficiency also is low within the region. The cycle of low energy production and consumption, pervasive poverty, and poor environmental conditions has contributed to high levels of insecurity. There is need to diversify energy sources and reduce dependence on biomass through harnessing the potential of the hydropower, geothermal, and solar power resources with which the region is endowed. Nonfood-based biofuels from sources such as jatropha also may be promising. Connecting large numbers of people to a power grid is unlikely to happen in the near future. Therefore, decentralized power systems are more practical alternatives.

There is an urgent need to diversify energy sources and undertake concerted efforts to prevent the degradation of resources. With research that advances technological capacities, abundant solar energy could be harnessed. IGAD's initiative to develop a geothermal program and improve access to non-biomass based energy is a step in the right direction.

Natural Resource Extraction: Resource Abundance, Development, and Conflict
Although the primary threats to environmental security in the IGAD region come from environmental degradation, extreme weather, and resource scarcity, other sources of instability

can come from the mismanagement of resource abundance. This can be seen in relation to two main types of resources—minerals (e.g., gold, diamonds, oil) and timber.

African countries have had great difficulty in translating mineral wealth into broad-based and diversified economic development. A high-value mining sector often has been associated with inflation, economic concentration, corruption, and conflict. It also appears to be associated with poor democratic performance. However, the successful example of Botswana indicates that these problems are not inevitable. In recent years, several new ways have emerged to manage mineral resource revenues transparently and equitably, including establishing an independent oversight committee (as in the case of Chad) or joining an international initiative (such as the Extractive Industries Transparency Initiative or EITI). These efforts seek to provide public information and decentralize benefits to include large sectors of the population and broaden benefits to include social infrastructure and services like health and education.

In other parts of Africa, timber has brought both significant revenues and significant conflict. Some of the possible policy interventions to reduce the potential for timber-related conflict include enhancing the capacity of forestry officials, increasing the transparency and equitable distribution of forestry revenues, and involving local communities and raising awareness about the problems associated with logging.

Good governance is the central challenge in ensuring that the mineral and timber sectors produce widely shared benefits and prevent instability and conflict. However, the role of corporate social responsibility (CSR) also is crucial. When dealing with local communities, discussions must be based on informed consultations and companies should be expected to do proper environmental impact assessments (EIAs).

An Environmental Security Assessment in Progress: The Lake Tana Watershed

Lake Tana is the second-largest lake in Africa, after Lake Victoria, and the source of the Blue Nile, which flows to Sudan and Egypt. The ecological integrity and productive potential of the Lake Tana watershed is of great significance to the IGAD region. FESS is currently undertaking an environmental security assessment of the Lake Tana basin.

Two intertwined critical concerns in the Lake Tana watershed are land degradation and siltation. Sedimentation and siltation around the lake are the consequence of severe land degradation and high soil erosion, aggravated by population growth and cultivation on steep and unstable slopes. High soil loss is causing serious damage to communities flooded annually and to the lake itself, which receives large loads of silt and sediments. With the additional threat of climate change, some observers fear that Lake Tana could fill in and dry up completely in a few decades in a manner similar to Lake Chad. The calculations of other analysts find this scenario to be highly exaggerated. Amid this uncertainty, a series of ongoing or planned dam-building, irrigation, horticulture, tourism, and other development projects could be affected or could contribute to the worsening of the situation, if trends continue.

The Government of Ethiopia is aware of these environmental risks and, with the assistance of international donors, is pursuing watershed management in the lake basin and mobilizing resources and training for better data collection. A variety of policies and regulations also have

been formulated and enacted. The FESS environmental security assessment seeks to bring to light the interactions among these plans and projects and the ongoing environmental challenges to help policymakers ensure that their efforts to reduce poverty and stimulate economic growth are not undermined by the degradation of natural resources. The case of Lake Tana provides an example of the interdependence of environmental security in the IGAD member states, especially with respect to transboundary water systems.

Environmental Security and the IGAD Draft Peace and Security Strategy

While drought and development were IGAD's main emphases when it was created, its current institutional mandate incorporates peace, security, and economic cooperation. The core issues of environment, drought, and desertification are now being handled in a comprehensive way that takes into consideration the introduction of these new issues.

Under the auspices of IGAD, the peace processes in Somali and Sudan have achieved some results. While Somalia still faces problems, there is hope that the achievements can be sustained in Sudan. These examples have helped demonstrate why IGAD needs a strategy to cover peace and security issues. When IGAD participated in these peace processes, it was without institutional frameworks or proven strategies. In the wake of these peace efforts, one recommendation was that IGAD needed to build a strategy to cover its peace and security efforts.

IGAD believes that to continue as a peaceful region, it must use the natural resources it has to promote peace and security. This is reflected in IGAD's draft Peace and Security Strategy, which includes such components of environmental security as natural hazards, environmental refugees, shared rivers and lakes, the development and use of energy, pastoralist conflicts, and natural resource management. CEWARN provides ongoing early warning with respect to cattle-rustling. Given that climate changes linked to drought, migration, pastoralism, and other issues, climate change also is an important consideration in relation to peace and security.

Recommendations

1. **IGAD should take an active role in addressing environmental security challenges and environmentally related conflict issues**. The threats to populations in IGAD member states from extreme weather (droughts, floods), water scarcity, land degradation (agriculture, pastoralism), loss of wetlands, and climate change are severe and increasing.

2. **Problems of environmental insecurity should be integrated into development policy planning**. IGAD should develop mechanisms to assist countries to make their respective development strategies and policies sensitive to environmentally linked conflicts by the integration of causes and consequences of environmental insecurity in development policy planning.

3. **IGAD should consider environmental security both a challenge and an opportunity in relation to conflict and conflict resolution and incorporate that perspective into its institutional strategies**. There is ample evidence from problems of resource scarcity and natural hazards in the IGAD region that environmental threats can increase tensions and serve as the amplifier and trigger for conflict.

4. **IGAD and its member states should take steps to recognize global climate change as a significant environmental stressor that has the potential to increase the number and intensity of regional conflicts**.

5. **Steps to address environmental security problems on a regional basis should be seen as a catalyst for further economic integration in the IGAD region.**

6. **The close relationship between environmental security and food security should receive greater attention**.

7. **Environmental security should be integrated into conflict early warning, conflict management, and peacebuilding**.

8. **The environmental security knowledge base should be increased, and mechanisms for information-sharing should be further developed and strengthened**. There is a need for more scientific knowledge to understand critical environmental change and security linkages.

9. **The capacity to conduct environmental security studies and assessments should be developed**. One key challenge is the need to improve the valuation and quantification of natural resources and environmental change in ways that are accessible and useful for policymakers and decision makers.

10. **A separate training on the ESAF methodology should be conducted**. There is a need to study and better understand the ESAF methodology, its substance, processes, and data requirements.

11. **An IGAD manual for environmental security assessment should be developed**. A manual covering the assessment methodology, processes, products, and outcomes is needed.

12. **Environmental security assessment studies of critical ecosystems and shared natural resources should be conducted**. IGAD should undertake periodic environmental security assessment studies of critical ecosystems and transboundary natural resources

13. **Traditional or local level environmental conflict management mechanisms should be strengthened**. There are established indigenous institutional arrangements for managing conflicts in each country. Decisions handed down by such traditional institutions may not have the force of law, but the force of tradition and community sanction may be no less binding than formal legal decisions.

III. OFFICIAL OPENING OF THE WORKSHOP

The workshop was officially opened with the following remarks by Dr. Tewolde Berhan Gebre-Egziabher, the Director General of the Ethiopian Environmental Protection Authority (EPA):

Environmental well-being is critical to sustainable development and peace. IGAD's role has expanded from its original role of one that focused on combating drought and desertification to one that includes coordination of policies and strategies for development of the sub-region. This means that IGAD's main responsibilities are to usher in lasting food security, lasting environment well-being, and fair political and humanitarian situations that enable agricultural productivity, infrastructure development, tourism, telecommunications, and internal cooperation. This focus will enhance the economic and technical capacity within the region, but also will allow for the effective care of the source for development: the environment.

While peace, security, cooperation, and economic development are vital and require attention, none of them can be achieved without natural resources. As the environment generates natural resources, there is a need to develop and implement appropriate systems that manage resources at the community level so as to guarantee sustained economic growth in each locality for generations to come. As environmental mismanagement becomes more insidious with time, mistakes made today will severely harm children in the future. Although member states have made efforts to address environmental problems in the last 20 years of IGAD's existence, rapid population growth and environmental mismanagement have worsened. Improving life while degrading the environment is impossible, and member states must care for the environment while it is developed, or else natural resources will degrade, economies will plummet, and children will not survive. Unfortunately, the capability and capacity to fulfill wishes to sustain the environment have failed and the natural resource base continues to be degraded. This is because institutional and legal frameworks have remained incapable of implementing what they need to do.

Because of population expansion, exposure to globalization, and markets, there are growing pressures to degrade values and exploit or abuse valuable minerals, water, forests, wildlife, artifacts, biodiversity, cultural norms, and livestock. Even when this is done, it is not clear who benefits and whether the region will be further exploited. This confusion is the root cause of many conflicts in the region. In addition, resolving conflicts is not easy, even through IGAD's coordination. Single country attempts cannot deal with inter-country relations. If predictions by climate scientists are reliable, future scenarios could prove disastrous. As the earth warms, desserts and arid areas will expand. Areas already moist will receive more rain. Increasing extreme weather will bring more droughts and floods. Changing weather and climate will create more environmental refugees and even the number and intensity of conflicts will increase.

The importance of environmental security and of achieving sustainable development, economic integration, and peace should not be underestimated. Achieving food security is unthinkable without sustainable management of environmental and natural resources, including soil and water. The scarcity or mismanagement of environmental resources can trigger conflicts, which, in turn, affect stability and economic development of the sub-region. For example, the region is losing soil at the rate of nearly 300 times more than what is being formed in some places.

Remaining soil is quickly losing fertility. Using chemical fertilizer is becoming increasingly expensive, and chemical fertilizers lack the humus that soil structure needs to resist erosion. Therefore, the region needs to incorporate agricultural practices that care for crops and the ecosystem as a whole. While ecological agriculture is labor intensive, labor shortage is not yet a problem.

What needs to be done is to develop effective strategies to achieve environmental security and sustainable peace and to mainstream them into national and regional economic and development frameworks. This is a requirement not only for the region's development, but for its survival.

IV. MEETING THEMES AND DISCUSSIONS

Environmental Security and the African Context

The workshop began by reviewing key aspects of the environmental security paradigm and their linkages to sustainable development and peace in Africa and the IGAD region.

By one definition, environmental security is a condition in which a nation or region, through sound governance, capable management, and sustainable utilization of its natural resources and environment, takes effective steps toward creating social, economic, and political stability and ensuring the welfare of its population.

There are important conceptual foundations that have contributed to the idea of environmental security, but beyond theoretical discussions, the field reflects on-the-ground realities facing individuals, communities, and nations in the IGAD region and elsewhere in Africa.

Environmental security postulates the following relationships between natural resources and security:

- Resource scarcity or the misuse of natural resources such as land, water, forests, and minerals increases the potential for instability and conflict.
- Environmental or natural resource crises, in combination with other factors, may escalate to generalized instability or conflict.
- Even at low levels, environmental insecurity can impede development and threaten human security.
- If left unrecognized or unresolved, environmental instability serves as a catalyst for economic hardship, social unrest, and conflict.

The development of the concept of environment security has been international and multidisciplinary. Major contributors to the field have included environmental experts, development specialists, conflict analysts, and climate scientists. In recent years, the traditional security paradigm has been redefined to include environmental issues, and the discussion became more inclusive, providing new opportunities for citizens to express grievances about environmental sources of insecurity and vulnerability. There has been a shift in focus to human security, which included the idea that security also is freedom from hunger, disease, and violence. In this context, environmental security discussions have become "people-centric" rather than focused on the security of states, and there has been a new emphasis on livelihoods.

The focus on climate change has helped to give greater coherence to discussions about environmental security. There is a growing understanding that climate change is going to exacerbate environmental changes already being seen, and that it will have significant effect on security. The Intergovernmental Panel on Climate Change (IPCC) has projected with a more than 99 percent probability that temperatures over land will rise, a finding with significant implications for the IGAD region. It has become clear that climate change mitigation and adaptation activities will have to be undertaken.

However, environmental impacts tend to be intervening variables that act in concert with other elements of security, including but not limited to economic growth, governance, social stability, and living conditions. Therefore, when analyzing environmental security, social, economic, historical, political, and institutional factors that have contributed to the situation need to be incorporated.

Early intervention in environmental security problems is important because the results of conflict are so devastating. There has been fundamental change in the nature of war, and it has impacted millions of people in Africa. The New Partnership for Africa's Development (NEPAD) has estimated that one out of five Africans live under conditions of armed conflict. Even internal conflicts have tended to spread to other countries, producing large numbers of refugees and internally displaced persons (IDPs). These conflicts are extremely brutal and have been characterized by a loss of distinction between civilians and combatants. For example, 5.4 million people have died in the ongoing conflict in the Democratic Republic of Congo, which has been driven in large part by conflict over high-value natural resources.

There are different conceptual frameworks for thinking about the links between the environment and conflict in Africa, but it is clear that there is a relationship between them. The precursors to conflict have varied according to each context, but there have been frequent signs of environmental insecurity. These have included a lack of cultivable land, declining amounts of grazing land, high population growth, water stress and scarcity, unequal access to resources, persistent poverty and social marginalization, and perceived or actual failure of the state to provide security. In many places, these challenges were magnified as a result of low levels of technology. Governance failures, corporate greed, and unregulated international trade also have lead to abusive exploitation of natural resources, resulting in conflict and human suffering.

The role of perceptions in conflict should not be underestimated: often it has not been simply poverty itself, but what people have thought about their future and current situations that have added to grievances. Conflict has occurred when communities have felt hopeless, generally as a result of inadequate government intervention or the inability of traditional responses and institutions to address the issues.

Environmentally linked conflicts in Africa have stemmed from a number of different sources, including:

- Farm land (as in Burundi, Zimbabwe, and Sudan);
- Grazing area (as in northern Ethiopia, southern Ethiopia, Borena and Guji, and Uganda's cattle corridor);

- Water (specifically transboundary rivers, which can be a source of either conflict or cooperation);
- Forests/timber (as in the Upper Guinean forest belt);
- Other non-renewable resources (e.g., diamonds and oil); and
- Natural disasters, which have displaced people and generated conflict.

Conflict also can be seen as the result of the search for coping mechanisms. At times in Africa, desperate households have migrated in order to find better economic circumstances, which in some cases have meant encroaching on the land of others. When institutions for conflict prevention have failed and traditional conflict resolution mechanisms have been undermined, conflict entrepreneurs have used ethnicity to gain and maintain political power and access to scarce resources.

Once stresses overload the environment, it cannot serve human needs, and changes taking place today may result in changes that cannot be fixed tomorrow. Yet, there is difficultly in acting quickly because environmental change is difficult to perceive and the time horizon for consequences is relatively long.

It is apparent that in Africa both resource scarcity and resource abundance have lead to conflict, but the triggers and drivers of each type of conflict have been different. In general, resource abundance problems have stemmed from poor governance, whereas scarcity problems have been driven by local level needs not being met. Governance failure has been a problem and a major contributor to environmental conflict in Africa.

People need resources to live, and it is unfair to say that people cannot use their resources to survive. Similarly, it is unfair for those who are already developed to tell developing countries that they should not use natural resources for their own development. However, this is not a simple issue—there needs to be a correct balance between developing and not harming the environment.

To support environmental security, the workshop participants recognized the need to strengthen state capacity to guarantee rule of law; provide transparent and accountable administration; and institute effective mechanisms to address and resolve resource-based grievances and disputes. Additionally, there was agreement on the need to develop the environmental security knowledge base, including capacity development for environmental security assessments, early warning, and policy development; and conducting environmental security assessment studies at the regional, national, sectoral, and ecosystem levels. There was further support for considering appropriate ways to mainstream environmental security assessment in policies, plans, and programs.

Water Resources: Scarcity and Environmental Insecurity

After the opening discussion of the environmental security paradigm, the workshop examined more closely the components of environmental security in the IGAD region, beginning with water resources and water security.

Water is a very scarce resource in the Horn of Africa, and the IGAD region is one of the most arid in the world. Moreover, water availability varies dramatically. Actual renewable per capita

water resources vary from as little as 367 m^3 per capita per year in Djibouti to 2,207 m^3 per capita per year in Uganda.

Data on water availability often is incorrect or skewed. For instance, the United Nations Food and Agriculture Organization (FAO) "double counts" when measuring water availability, because it continues to add the same river water as it flows through separate countries. Data for access to an improved water resource also is skewed. Although it is defined as having access to 20 liters per person per day within a distance of 1 km, this does not ensure immediate access to clean water. Per capita water resources have decreased as population has increased. Over time, this situation may create drastic changes in water availability.

The IGAD region's access to improved water and sanitation numbers are improving, but the definition of access has a very wide range and can be misleading. In combination with poor living conditions, water scarcity may lead to heightened tensions, social turmoil, and conflict. Water, moreover, is a resource that can generate conflict across borders. Scenarios have shown how water scarcity and environmental security are linked. For example, if a country has a low per capita water withdrawal currently, the withdrawals will increase as population grows and as industrial development progresses. Less water availability generates competition for its use, which can lead to conflict. The intensity of the conflict is mediated by political and social institutions, social relations, and the preferences and beliefs of people.

Darfur is a current example of water-related conflicts in the region. Approximately 80 percent of the conflicts there between 1930 and 1990 were related to grazing (water and pasture) and land, while 20 percent were attributable to administration and politics. The Darfur situation clearly illustrates how water scarcity leads to insecurity. Other water-related conflicts in the region have included those in Kenya and southern Ethiopia.

As the 2006 United Nations Development Program definition of water security states, water security is about ensuring that every person has reliable access to enough safe water at an affordable price to lead a healthy, dignified, and productive life, while maintaining the ecological systems that provide water and also depend on water. Many people hold the misperception that water is abundant. In fact, 97.5 percent of world water is too saline for human consumption and use. So, the world relies on only 2.5 percent of the world's overall water resources. Of that amount, lakes and rivers provide 0.3 percent, while groundwater provides only 13.8 percent. Glaciers are the largest source, contributing nearly 70 percent of the world's freshwater resources. The assumption that lakes and rivers can provide abundant amounts of water should be corrected.

Water scarcity is defined as 0 to 1,000 m^3/person/year, while water stress is defined as up to 1,700 m^3/person/year. For IGAD countries, most of them are outside of the water stress category now. However, by 2025, all member states but Sudan are estimated to fall under the water stress category.

Lake Chad is an example of what can happen without proper water management. In four decades, the lake has dwindled to 1/40 of its original size, and this may be a cautionary tale for

the IGAD region. Lake Victoria and Lake Tana are two important lakes of concern within the IGAD region. Prevention is better than trying to find solutions after the impacts have been felt.

When discussing water scarcity in the IGAD region, it is important to remember that global fresh water is finite and its per capita availability will dwindle as population increases. Moreover, water scarcity is a function of physical scarcity, political manipulation, and mismanagement. The region also should consider that, to date, water infrastructure and services have not kept pace with rising demand. When water is scarce, ensuring water security becomes ever more difficult. Member states will need to double their efforts to address the situations they face. It is easy to blame the rich countries or the lack of action despite numerous international agencies (e.g., 23 United Nations water-related agencies) and declarations. The frustration among communities and individuals attending meetings discussing water issues is palpable. Many feel like the requisite action to back up commitments is lacking.

Despite frustrations and challenges, there are opportunities to sustainably develop water resources in the IGAD region. To date, only the Nile River has a process for transboundary river coordination. There is some discussion and cooperation on other bodies as well. The Lake Victoria Basin Commission is another example of cooperation. Juba, Awash, and Turkana all provide potential opportunities to engage in cooperative management.

Conflict resolution mechanisms do exist and the region should build on them. Such efforts would provide a basis for development with peace and stability. The UNDP Human Development Report indicates that the budgets for defense in the region are larger than for water and education. The conflict resolution capacities of the African Union and IGAD should be strengthened. Transboundary water cooperation and integrated natural resource management are benefit-sharing opportunities. Highlighting the tangible benefits of these actions will provide the space for resolving problems and building support within the region.

Interventions and measures to improve environmental security and address water scarcity in the region can be undertaken at multiple levels. The 2006 UNDP Human Development Report recommends that every country pass legislation making water a human right. National strategies for water and sanitation improvements need to be implemented along with the allocation of financial resources. Each country should build its water storage capacity.

At the international level, bilateral and multilateral donors can ensure proper implementation of various commitments including the 2003 Rome Declaration on Harmonization, 2005 Paris Declaration on Aid Effectiveness, and the 2008 Accra Agenda for Action. Further, civil society groups and communities can strengthen and enforce investments in water security and conflict prevention.

The workshop participants agreed there was a need for research into water availability, especially groundwater and rates of recharge, as well as the recognition of information gaps in order to successfully manage water resources in the IGAD region. At present, these issues are complicated by the fact that people frequently disagree about basic information and do not always trust the available data. In this context, more coordination across water basins is necessary.

The Nile Basin Initiative (NBI) has shown that these issues are not as easy as they might seem. Some issues are still under consideration after 10 years of discussion. If possible, IGAD should move to create a water platform that could help bridge gaps in the region. It is anticipated that the organization's peace and security strategy will promote cooperation on water resources. It also will allow cooperation between NBI and IGAD and enable IGAD to put into practice other recommendations put forward by member states. At present, IGAD is implementing a project to measure surface and groundwater resources, so some new data might be available soon.

Environmental Security and Food Security

One of the main challenges facing the IGAD region is food security, to which the workshop next turned. As a general rule, in places where there is environmental security, there also is relatively good food security. And in order for agriculture to contribute to reducing food insecurity, it must be undertaken sustainably.

The Gedeo Agro-Forestry area of Ethiopia is an example of a well-managed agricultural community. It is characterized by home level production on multistory vegetation plots. The community has successfully conserved soil and water, and has ensured access to biomass as well. These factors have contributed to a high carrying capacity of the land (582.3 persons/km^2). Outputs from the Gedeo Agro-Forestry area are comparable to most high-yield, input-dependant agricultural systems. The development projects that have this type of environmental emphases are producing better results. Some examples include the Sustainable Land Management (SLM) project and the Managing Environmental Resources to Enable Transitions (MERET) program. These two projects have high rates of return, in part, because they focus on sustainability of the environmental base.

Worsening environmental conditions often lead to food insecurity. Deforestation, which results in soil erosion and a reduction in land fertility, is one important example. Declining crop yields could be a source of potential instability. However, there are a large number of factors driving food insecurity, including decreasing per capita cultivated land and under-maintenance of land resources. Other factors include changes in settlement patterns as a result of migration and IDPs, which increase pressures on host communities; urbanization, which decreases food supply and drives up demand; low sanitation coverage, which increases the incidence of disease; climate variability; and land tenure issues.

There are other driving forces behind the worsening food situation. Soil erosion has accounted for more than 80 percent of the annual cost of environmental degradation in Uganda. Invasive species such as *Eichhornia crassipes* have reduced fish catches as well as food production. Somalia, Ethiopia, Eritrea, and Sudan are major breeding grounds for the desert locust, the foremost pest threat in the IGAD region. Other pests that affect crops in the area include the army worm, rats, and small birds, which can devastate sorghum and other grain crops. Development of indigenous natural resources technologies has been very slow, leading to an over-reliance on technologies developed outside the region. There has been a lack of income-generating opportunities.

Food production is disturbed during times of conflict and the displacement of people. Endemic conflicts resulted in a 10 percent increase in refugees in East Africa and the Horn of Africa in 2006. Population pressure amid low productivity threatens food supplies. Between 1991 and 2015, the per capita cultivated land in Uganda is expected to shrink from 1.1 hectares to 0.6 hectares as a result of population growth. In relation to scarcity, urbanization may pose serious problems, especially because city dwellers consume more resources than rural residents, with a higher consumption of animal products.

One serious cross-cutting issue is drought, especially because droughts are increasing in frequency. The workshop participants agreed that there is a need to do more to address droughts in the region. It was noted that drought is a slow onset problem, and other areas of the world, such as India, have managed to avoid famines.

Food security is not just about how much food farmers can grow. Poverty and livelihood security are fundamental contextual factors. If farmers have to sell all that they harvest to pay for medicine and school fees, they have nothing to eat. The definition of food security needs be understood in terms of access to food, not just the ability to produce it, and the food needs to be nutrient-rich. It was noted that the United Nations uses the idea of livelihood security to address this issue.

The workshop participants took note of a number of possible interventions to address the interrelationships between environmental security and food security. These included promoting off-farm livelihoods, especially in drought prone areas; investing in the restoration of ecosystem services, including introducing incentives for protection of key environmental resources/ecosystem goods and services; crafting social and economic policies to improve the capacity of food producers in poor areas to manage soil fertility, soil moisture, pest population, and biological diversity; improving access to markets and storage facilities; knowledge sharing; and investing in pest management activities. Given the important role of women in food production, it also is important to empower communities in a gender-sensitive manner.

There were further steps identified at the level of policy. Among these were periodic national and local environmental security assessments to generate more compelling information on the links between food security and environmental security; tools and methodologies to map food security and environmental change links; and participatory land-use planning processes that identify and mitigate the risks of natural resource degradation and other environmental impacts.

Pastoralists and Environmental Insecurity

In the IGAD region, the so-called lowlands, rangelands, or arid and semi-arid lands (ASAL) are the cradle of pastoralism, an important livelihood and way of life for a significant percentage of the population. More than 25 million people—the owners of millions of cattle, sheep, goats, and camels—are engaged in pastoralism on lands that cover 60 percent of the total IGAD area. The environmental security of the pastoralists is endangered by recurrent droughts, water and pasture shortages, land degradation, invasive vegetal species, population growth, policies of agricultural expansion, sedentarization, lack of health and educational facilities, and national and transboundary conflicts. In addition, it appears that climate change, with its negative effects on

the natural resource base, will represent one of the most important threats for pastoralists and pastoralism in the IGAD region.

The pastoral way of life, characterized by its seasonal mobility or in response to drastic events such as droughts, has demonstrated an efficient and sustainable management of scarce natural resources such as water and pasture. However, centralized policies since colonial times have ignored the environmental and economic benefits of pastoralism and, in combination with poor social services, have led to environmental insecurity. Among the consequences are environmental degradation, lack of water and pasture, decrease or loss of livestock, increasing poverty, and even violent conflicts.

In Djibouti, pastoralism accounts for approximately 3-5 percent of GNP, and the pastoral population is estimated to represent 20 percent of the total population, composed by the two main ethnic groups, Somali and Afar, each having their specific customary rules for the lands they use. According to the cycles of rainy and dry seasons, transhumance occurs between mountains, plateaus, and plains. These ethnic groups are of the same population as those in the adjacent borderlands of Ethiopia, Somalia and Eritrea, and they are nomadic and semi-nomadic, with small ruminants, goats, sheep, and camels.

Ethiopia has the largest number of livestock in Africa. Pastoralists own about 27 percent of cattle, 26 percent of sheep, and 60 percent of goats. The pastoral zones in Ethiopia cover almost 700,000 square kilometers of range lands. These areas are occupied by 8-9 million people, of whom 56 percent are pastoralists and 32 percent are agro-pastoralists, with just 22 percent urban dwellers. The pastoralist populations are very poor—less than 20 percent have access to education and human health services.

Pastoralists consider their animals as stored value and as a source of protein based on milk. Animals are only slaughtered or sold in the case of liquidity crises or for important celebrations. In the rural and in the urban peripheral zones, extensive pastoralism ensures the livelihood of the people. Increasingly, a sedentary mode of life can be observed in these areas, and it has modified the traditional social structures of the pastoralists, which had previously ensured sustainable use of natural resources. Inter-ethnic conflicts occur increasingly given the cross-border mobility of the pastoralists in their search for pasture and water.

Pastoralists experience a variety of problems in their natural environment. These include soil erosion, deforestation, recurring droughts, desertification, invasive species, and land degradation resulting from over-cultivation and over-grazing and loss of biodiversity. But the most important difficulties are recurrent droughts and floods. Frequent droughts cause high animal mortality, followed by famine and high rates of mortality in the human population. Population growth, privatization of grazing lands and water resources, land use shifts in favor of sedentary farming, and inappropriate livestock development projects are other identified constraints, which interact in a negative cycle to spur the weakening of local institutions and traditional cultures, further degradation of natural resources, and growing vulnerability to ecological, economic, and cultural stresses.

In recent years, various programs were implemented for livestock development, but basically they were oriented toward the commercialization of pastoralism to exploit livestock potential. Some observers have reported that these interventions have eroded vital indigenous institutions and negatively affected the environment. Critics have noted the lack of a holistic approach toward pastoralism and the undervaluation of pastoralism as an economic activity. In response, new policies are being implemented to create pastoralist affairs commissions and pastoralist development institutions and programs. However, there still a huge task ahead to adequately deal with the problems of pastoralists.

Evidence of global climate change caused by human activities is increasingly supported by scientific data and observed climatic disturbances. In the IGAD region, it is expected that the increasing greenhouse effects will involve increasing climate variability, with unfavorable and destructive weather patterns for the fragile pastoral ecologies. The changing climate will render even harsher the pastoralist's natural environment of arid and semi-arid conditions. Increased temperatures, erratic and unevenly distributed rainfalls, changed soil and atmospheric moisture patterns, increased evapotranspiration, and modified surface and groundwater supplies are some of the consequences that would deeply affect the seasons, the grazing lands, the pastures, and the availability of water resources. Furthermore, the frequency of natural hazards is likely to increase, with recurrent droughts and floods. Grassland productivity is likely to decrease in quantity and quality with changing climatic conditions. Less grass and water on the one hand, and more recurrent droughts and floods on the other, would reduce livestock significantly and, therefore, the source of food and livelihood of pastoralists. Reduction in the availability of water resources and livestock would lead to social and economic consequences such as further dislocation of pastoralists, reduction or loss of livelihoods, famine, and conflicts.

One of the most important factors in the loss of land in pastoral areas is related to both small-scale and large-scale agricultural development programs on favorable grazing areas. Allocation of such lands in favor of industrial activities, urban expansion, and privatizations also reduce grazing areas. Policies imposing sedentarization and sedentary farming associated with agriculture produce similar results. Population growth is another factor that affects the resource base.

Pastoralists are affected by negative perceptions that they degrade the environment, they are backward and resistant to change, they are predisposed to violence, and they contribute little to the national economy. Despite their number and their potential role in society, pastoralists have been marginalized throughout the region.

Conflict in the pastoral regions is a particularly complex problem, and violent conflicts involving pastoralists have become widespread over the Horn of Africa. Some of the causes of conflict include cattle-rustling, encroachment by pastoralists or cultivators, the availability of arms, weakening of traditional governance systems, inappropriate development policies, and inadequate land tenure policies. The conflict between pastoralists on the Ethiopian side of the Karamoja Cluster is related to food insecurity, but other factors such as the absence or weakness of government officials and a lack of security and infrastructure exacerbate the situations. In southern Ethiopia (Oromiya region), Borena, Gabra, and Guji, conflict is caused by competition over natural resources and tribal tensions. In the northeastern region of Kenya, Somali and

Samburu conflict is related to water and pasture scarcity caused by drought. Because of pasture and water scarcity, the Mukogodo Masai pastoralists in Laikipia, Rift Valley Kenya, invaded private ranch farms to recoup livestock losses.

Poverty is a significant problem. The livelihood of the pastoralists in the arid and semi-arid regions of IGAD is mainly based upon livestock sales, but other sources of income exist, such as wage labor, trading, farming, and gathering and selling wild products. The existence of livestock alone is not a sufficient factor to insure a basic income for pastoralists. Pastoral people tend to diversify their income by diversifying their activities, but opportunities and possibilities for diversification vary between the wealthier and the poorer pastoralists.

Most of the pastoralists of the IGAD region are experiencing significant insecurity. Studies on natural resources, pastoralist livelihoods, local conflicts, and government policies reflect the interactions among different factors that necessarily call for integrated approaches, rather than merely targeted actions. At the same time, pastoralist groups from country to country and from region to region have their own specificities that need to be taken into account.

There are frameworks, proposals, and opportunities that could contribute to an integrated approach. At the systemic level, IGAD countries are signatories to the main international conventions related to the environment and human security, including global climate change, biodiversity, desertification, Agenda 21, the Millennium Development Goals, the Plan of Implementation of the World Summit on Sustainable Development, the IGAD environmental strategy, and other IGAD policy frameworks. Even if their impacts on the environmental security of pastoralists are not yet visible, these initiatives can contribute by building a favorable framework for adequate policies and programs to be formulated and implemented. Economic frameworks such as COMESA also might become significant to contributors to the economic development of pastoral areas.

IGAD is playing a major role in addressing pastoral environmental security issues. IGAD has a food security strategy, a livestock policy initiative (LPI), and Sub-Regional Action Programme (SRAP), whose objective is to achieve sustainable food security and poverty reduction. Studies on livestock are available for each IGAD country, and consideration of the role of livestock in the national economies is attracting increasing attention. IGAD also promotes Community Based Natural Resources Management (CBNRM) practices.

Since 2003, IGAD has launched the conflict early warning and response mechanism, CEWARN, which relies on a wide range of information to insure peace and security. Working with national units and national research institutes, it seeks to monitor cross-border pastoral activities and related conflicts. The CEWARN mechanism has a global approach and might become more widely applied and strengthened. In order to prevent or reduce the impact of conflicts, actions that have been proposed include ensuring emergency access to natural resources such as water and pasture, making efforts to avoid the political marginalization of pastoralists, supporting conflict prevention activities, and promoting security sector reform.

It is likely that the most important threat to the environmental security of pastoralists in today's environment is global climate change. Recurrent droughts may become more frequent and more

severe, resulting in water and pasture shortages and putting higher pressure on pastoralists, their livestock, and their livelihoods. Such disastrous situations must be stemmed as they represent one of the main causes of violent conflicts in the region. Given the interactions among the numerous social, economic, environmental and policy factors, solutions for pastoralists' environmental insecurity requires a sound multidimensional strategy. Although opportunities and initiatives are available at different levels and could contribute significantly to the relevant concerns (e.g., IGAD programs such as ICPAC, CEWARN, CBNRM, and LPI), a great deal remains to be done. This includes addressing the persistent lack of data needed for a better understanding of the environment in the Horn of Africa.

Global Climate Change: Threats to Human Security and the Potential for Conflict

Climate change has become a huge concern for the IGAD region, and its urgency as a threat to human security and as a policy issue is increasing. Climate variability has long been a fact of life in sub-Saharan Africa. Drought is one of the most important occurrences, with severe droughts taking place in the last four decades with what appears to be increasing frequency. The harsh consequences of drought for human security can include famine and migration.

The IPCC Fourth Assessment report includes charts and maps indicating future impacts to enable policymakers to visibly understand the likely consequences. Some areas of Africa will experience water shortages; others will see reductions in agricultural productivity or experience health problems. Essentially, there is vulnerability all across the continent. Moreover, according to the report, Africa is one of the most vulnerable regions because it is exposed to both risks of climate variability and low coping capacity.

IPCC data indicate a profound reduction in rainfall in the Sahel during the past half-century. A rise in surface temperature over the neighboring Indian Ocean has led some scientists to believe the rainfall decline will continue. However, the scientific community lacks complete consensus on this. Some scientists, in fact, predict an increase in rainfall. The high degree of uncertainty has made planning difficult.

IPCC findings conclude that while natural forces will play a role in contributing to temperature increases, anthropogenic effects are sizeable. In the future, there is an estimated 90 percent likelihood of increased variability and extreme climatic conditions. Regions will either experience very wet or very dry conditions, and temperatures will increase. The climate will be moving toward extreme conditions, which may have grave consequences for livelihoods dependent on the environment.

The snow melting on Mt. Kilimanjaro is an example of the changing climate. The difference in snow cover between 1976 and 2000 demonstrates that the ice is declining. This ice cap feeds seasonal streams and downstream communities already have witnessed flow reduction and a drying of streams. While scientists have not all agreed, some predict the ice cap will disappear by 2020. Pictures of Uganda's Rwenzori Mountain between 1987 and 2002 also show a decline in ice.

Africa is not vulnerable simply for climatic reasons. There are multiple stresses that make the continent vulnerable, including social, economic, and historical factors. Social vulnerability is

due to an unbalanced and increasing population, widespread hunger, and health problems. Most of the countries lie in the bottom of the UNDP Human Development Index. Low technology, endemic poverty, heavy dependence on agriculture, and low productivity characterize African countries, which compose 65 percent of all LDCs. Approximately 43 percent of the continent is arid or semi arid, and the majority of disasters are climate-related.

The continent's agricultural productivity is particularly vulnerable, in part, because farmers are dependent on rain to water their crops. Even irrigated agriculture is not that promising. Areas where 25 percent to 50 percent of farmers are dependent on rainfed agriculture will be impacted as climate changes. However, these same countries already are struggling with environmental problems. Many areas have poverty rates in excess of 75 percent; these same areas are dependent on rainfed agriculture. The "Global Environment Outlook 2000" found that regardless of climate change, the number of countries experiencing freshwater stress will rise between 1995 and 2025. Sudan is one of the countries predicted to experience greater water scarcity.

According to one definition of conflict, "conflicts are situations involving people or social groups with different interests, and mutually antagonistic tendencies and opposing influences competing for the use of limited resources to ensure or enhance their livelihoods." The key words from this description are competition over limited resources and livelihoods, two components underlying causes of conflict in many situations in the IGAD region. Conflict also could threaten social networks, perpetuating poverty and constraining development.

The 1994 United Nations definition of human security—"safety from chronic threats such as hunger, disease, and repression as well as protection from sudden and harmful disruptions in the patterns of daily life —whether in homes, in jobs or in communities"— provides another perspective for understanding conflict. Conflicts lead to chronic threats, which lead to hunger and the disruption of social relations, among other negative consequences.

Climate stresses increase competition for limited resources. They are likely to contribute to tensions among ethnic and tribal elements and among different natural resource users. Many analysts view climate change as a threat multiplier and as one of the biggest threats to development.

In Africa, the impacts of climate variability, such as water shortages and food scarcity, already have triggered disputes over resources. In the coming years, food security problems are expected to increase as natural resources and available livelihood options decline, leading to a higher degree of competition over resources and greater instability within the region. The lack of equity in resource use also could widen the gap between groups, increasing tensions and leading to conflict.

The United Nations Office for the Coordination of Humanitarian Affairs indicates that in the Central and Eastern Africa region, there are two high intensity conflicts (Somalia and Darfur), four low intensity conflicts (northern Uganda; Somalia; the Central African Republic, with spillover into Chad; and the Democratic Republic of the Congo), and six areas of tension (Central African Republic-Darfur, Ethiopia-Eritrea, Somalia, the Lord's Resistance Army presence in the Democratic Republic of the Congo, the Ogaden, and the Kenya-Uganda-Ethiopia

border). As can be seen, the Horn of Africa has a large share of the conflicts occurring within the Central and Eastern Africa region.

The impacts of conflict on livelihoods in the region are widespread and in some places severe. Small-scale farmers and pastoralists who compete for resources often come into conflict. Today, sedentary farmers sometimes see pastoralists as the enemy, but this was not the case historically. Pastoralists have experienced the greatest loss of land. While pastoralists have been viewed as intruding on agricultural land, they are actually victims themselves. In the last decade, the loss of cultivable land has led to declining productivity and the need for more land for sedentary farming. This increase in land for farming has blocked natural routes for pastoralists, which has threatened their livelihoods.

Conflict is a chronic problem for the region. Seven million refugees have spent at least 10 years in a refugee camp. Life as a refugee brings vulnerability, loss of dignity, loss of culture, and creates a community reliant on aid. Often, refugee camps can lead to the deterioration of nearby natural resources as the people are dependent on them for energy and housing. As pressures increase, conflict is more likely to result and the cycle of conflict and environmental degradation continues.

To illustrate the relationship between climate change and human insecurity, the example of the conflict in Darfur provides useful lessons. The region is one-fifth of Sudan, bigger than France; it borders three countries (Chad, Libya, and the Central African Republic) and is in a state of continuous vulnerability, with no single river, stream, or other surface water. Darfur is susceptible to climate variability, particularly droughts. According to a study of Kordofan and Darfur, climate change has had negative impacts on water availability and the productivity of subsistence crops (e.g., sorghum and millet). Darfur is a region with low adaptive capacity for many reasons. The nomadic system has been under pressure due to declining rainfall and loss of traditional routes. Sedentary farmers have expanded their land, blocking the routes for pastoralists. Between 1961 and 1998, frequent episodes of drought severely affected Darfur.

The drastic fluctuation in rainfall and the frequency of drought have resulted in food insecurity and famine, rising tensions among stakeholders over resources, and escalating violence and the use of arms. Overwhelmed by multiple factors, the traditional system has been unable to contain tensions before problems escalate. It is overly simplistic to say that drought triggered conflict in the Darfur. Drought played an important role, but ethnic and political problems also pushed groups into violence. Today, one finds threatened livelihood systems, a complete lack of security, changing social structure for the IDPs, land tenure disputes, rising tensions between resource users, rising ethnic tensions, and a deteriorating environment and natural resources.

Just as multiple factors were involved in creating conflict in Darfur, a comprehensive approach to peacebuilding could prove successful. Peacebuilding refers to the full spectrum of interventions and may include forgiveness, cooperation, negotiation, mediation, facilitation, creation of mutual understanding, and reconciliation, as well as enhancement of human, social, and natural capital. At the same time, problems that are partly resource-based need partly resource-based solutions. Natural capital should be rehabilitated and natural resources conserved.

A diversity of livelihoods should be developed so that dependence on natural resources is alleviated.

In facing the prospect of climate change in the IGAD region, the workshop identified a number of key points for further reflection. First, there is a need for more scientific knowledge to understand the links between climate change and conflict. So far, few studies have been conducted to explore this relationship and a more integrated approach is needed to research the different dimensions contributing to conflict. The relationship is reciprocal—conflicts represent an additional risk that threatens the sustainability of the creation of people's livelihoods.

Resource-based green solutions could contribute to a more stable economic and social environment, the amelioration of conditions that could trigger tribal conflicts, the improvement of local adaptive capacity to climate variability, and the reduction of out-migration and displacement.

The National Adaptation Programmes of Action (NAPA) developed by IGAD member states have guidelines with a bottom-up approach that will foster local-level solutions. NAPAs should follow national development strategies and plans, and be mainstreamed into other policies.

In relation to climate change adaptation and mitigation, the IGAD region will have to adapt no matter what mitigation efforts are implemented. Mitigation efforts should be conducted by developed countries in order to reduce greenhouse gas (GHGs) emissions. But, whatever developed countries do to reduce GHGs, there will be some residual level of climate change impacts, particularly within the coming decade or two. While Africa needs to develop and consume energy, following the same development patterns as industrialized countries will exacerbate the problems the continent is facing.

Environmental Security and Regional Integration in the IGAD Region

Broadening the focus of the discussion, the workshop next focused on the mutually reinforcing relationship between environmental security and regional economic integration. Environmental security enhances regional cooperation and economic integration; conversely, this provides opportunities for improving the management and use of natural resources.

The IGAD region continues to be hit hard by recurrent drought, desertification, climatic variability, and famine. While the precise role of environmental degradation in conflict, destabilization, and human insecurity may differ from situation to situation, there are growing indications that it is a critical underlying cause of instability, conflict, and unrest. Many African governments have in recent decades been stabilizing their economies and democratizing their political systems. There are significant challenges despite the successes. High population growth, conflict, environmental degradation, and other issues threaten development. IGAD member states, development partners, UN agencies, and NGOs have devised policies and programs to address these issues. They have slowed environmental degradation, but have not been successful in reversing it, or in improving human security. The current challenge is to involve everyone in forming alliances and creating horizontal and vertical integration. Horizontal integration entails cooperation among sectors and development organizations, including government, the private

sector, and civil society. Vertical integration refers to cooperation among local, national, regional, and global institutions.

The IGAD region has numerous shared natural resources, and proper integration between nations will be critical for their effective management. Lake Victoria, which is important for fishing, domestic water withdrawal, industry, and other uses in Kenya and Uganda, is one major example. The use of the Nile waters is another. These multiple uses create competition among users and increase pressure on transboundary resources. In order to alleviate these issues, IGAD countries must work together on regional integration to achieve common objectives.

Regional integration is the joining of individual states within a region into a larger whole. The degree of integration depends upon the willingness and commitment of states to share their sovereignty. Regional integration initiatives can explore a wide variety of activities, including strengthening trade, encouraging private sector development, developing infrastructure programs targeting economic growth, strengthening public sector institutions, institutionalizing good governance and an inclusive civil society, and strengthening regional interactions with other regions of the world.

However, regional integration also can be strengthened by building environmental and natural resource programs at the regional level. A multifaceted environmental security agenda can be advanced by regional integration in ways that give momentum to the regional integration process itself. These might encompass environmental governance, drought management, climate change, sustainable energy, land use, population displacement and migration, disease control, and transboundary water resources. This agenda could make a positive contribution toward poverty reduction and mitigating conflict.

In fact, environmental issues already have had a major impact on the IGAD region. There have been mass displacements of populations due to water scarcity, agricultural land shortage, fuelwood needs, and the depletion of grazing and other resources. Inter-ethnic conflicts have erupted due to spontaneous settlements of people from one region moving into neighboring regions caused by land and other resource depletion. Encroachment of pastoralist populations onto ranches and farming land has resulted in frequent conflicts with sedentary agricultural populations. Dispute over the control of Nile waters has been a longstanding obstacle to growth and development in the region. This is compounded by the lack of a new treaty to resolve the pending issue of water security. These issues require numerous partners and actors in order to move forward and manage them.

These challenges also require a proper legal framework, capacity, and enforcement mechanisms. Some institutions already have been created to coordinate implementation of transboundary natural resources in the IGAD region and should function as technical expert agencies and information providers to help facilitate regional-scale cooperative working arrangements. Capacity building is another necessity. Building linkages across regions and problems requires skills that are often in short supply. This means developing materials for communities and translating and disseminating technical information.

For regional and national harmonization to occur, domestic initiatives are needed. Building trust and ownership must be undertaken to overcome longstanding mistrust in participating states. Adopting a gradual approach in implementing regional agreements could restore confidence, while promoting outreach and communication. This also will assist in overcoming public opposition and skepticism and allow the seeds of regional cooperation to grow.

The workshop participants recognized that the promotion of joint sustainable development strategies in IGAD can help create an enabling environment for cross-border and domestic trade and investment. The region should strive to achieve regional food security and encourage and assist efforts of member states to collectively manage natural and manmade disasters and their consequences. There is a need for IGAD countries to harmonize policies, including those related to trade, customs, transport, energy, environment, communications, and agriculture. To diversify economic activities, the IGAD countries should promote and strengthen cooperation in research and development and the application of technology and science to environmental concerns.

An Approach to Environmental Security Assessment: The FESS ESAF Methodology

FESS presented its Environmental Security Assessment Framework (ESAF) as one example of environmental security assessment methodologies. The ESAF is a toolkit, not a rigid methodological recipe, and it has the flexibility to assess a wide array of environmental security problems, whether at the national, local, or ecosystem level.[2] FESS originally began with country-level analyses, but has since incorporated assessments that cover sectors and sub-regions, including a study now underway on the Lake Tana watershed.

The ESAF examines key environmental variables such as land use, water quality, deforestation, and natural hazards, but places them in the broader context of reciprocal linkages with political, economic, social, historical, and cultural factors. The ESAF process attempts to develop a detailed understanding of how specific environmental problems in specific situations are contributing to vulnerability, instability, insecurity, or conflict, with a view to generating actionable recommendations.

FESS does not view environmental sustainability as implying absolute limits. Rather, it includes limitations as conditioned by available technology and social organization. Scarcity is managed differently in different places, and the capacity of the environment is different in different places.

ESAF findings are designed to inform policymakers and stakeholders, facilitate the establishment of clear priorities, and contribute to the development of effective and sustainable policies, programs, and actions. In addition to interviews with government officials and nongovernmental experts, FESS engages with communities and seeks to get their input as a means of determining the root causes of environmental security problems.

The ESAF proceeds in nine phases:

Phase I, the initial profile of the study area, examines key issues that are part of the overarching framework for understanding problems of environmental security, beginning with the role of

[2] A more detailed presentation of the ESAF methodology appears in Annex III.

governance. How do people express their concerns? How are decisions enforced? In terms of the economy, who owns and controls resources? How do groups relate to one another in terms of class, race, religion, or other factors? These interactions are central to understanding conflict situations because those who feel marginalized are more prone to grievance and mobilization.

Phase I also looks at the international context. Border disputes and other conflicts with neighbors, especially over natural resources, can increase environmental security concerns. Foreign aid and existing national government programs are taken into consideration because many of these programs address aspects of environmental security.

Phase II involves the collection and analysis of data that link the environment to economic and social conditions. These data help to identify which resources are critical to stability, and which societal coping mechanisms are under stress. Qualitative questions also help to uncover the perceptions that people have about their environmental problems. Phase II's economic analysis evaluates the links between the country's or region's economy and its dependence on natural resources, as well as potential links to instability and conflict. Socioeconomic analysis is an important part of the analysis because livelihoods are at the base of environmental security. The ESAF also considers demographics, gender relationships, and education levels. These issues are then evaluated to determine how they may be related to social stability.

Phase III, the analysis of *Critical Concerns*, involves identifying problematic issues, sectors, or resources that may be directly or indirectly integral to stability based on their value and significance to economic, political, and social well-being. After gathering as much information as possible about selected critical concerns, a process of analytic prioritization begins. In this phase, the ESAF looks at environmental governance, defined as the traditions and institutions by which power, responsibility, and authority over natural resources are exercised.

Phase IV of the ESAF develops a list of *Environmental Security Factors*— issues and problems related to the environment with significant implications for economic and social stability and welfare, potentially posing a threat to security. The ESAF breaks down environmental security factors into contributing factors, effects, affected stakeholders, and security implications in order to assess a full range of possibilities along the security spectrum.

Phase V tests hypotheses by re-engaging with experts and stakeholders who have been consulted during the study and revising initial assumptions, if necessary. This phase seeks to understand who the different constituencies are that are affected by the threats to environmental security and to assess the likely responses of those affected and the scenarios that these responses may generate.

Phase VI completes the stakeholder profile and analysis and determines areas where interests and uses of natural resources by stakeholders may engender conflict among groups. *Phase VII* generates scenarios that establish the urgency and significance of the final environmental security factors by identifying and bounding possible outcomes in three scenarios. The first extends current trends, the second anticipates the effects of possible shocks that could accelerate negative trends, and the third envisions the possible results of positive policy interventions by government and constructive steps taken by other relevant stakeholders.

Phase VIII is a final review of local, national, and international programs that already address aspects of the critical threats to environmental security. This ensures that the recommendations that are made will not overlap with existing projects. In *Phase IX*, the final environmental security report is disseminated to provide a comprehensive assessment to all the relevant parties and stakeholders. The recommendations are addressed to government authorities at different levels, nongovernmental experts, traditional leaders, and other stakeholders in civil society. Environmental security assessments must make recommendations that can be implemented. The ESAF helps to identify tangible and viable follow-up activities and options.

The workshop participants noted that it is important to clarify differences between the ESAF and both Environmental Impact Assessments (EIAs) and Strategic Environmental Assessments (SEAs). Although these three methodologies have areas of overlap, they have basic differences. Generally speaking, EIAs are done during the planning stages of major projects to evaluate their potential impact on the environment. SEAs focus on ways of identifying and mainstreaming environmental considerations into the entire range of government policies. The ESAF is very different from both of these. The ESAF has neither a narrow focus on specific projects like EIAs nor a broad focus on the entire array of environmental factors relevant for government-wide policies like SEAs. Instead, with the goal of averting instability and conflict, the ESAF examines how the use or misuse of natural resources and environmental change may threaten human security and social peace in nations and communities. The purpose of the ESAF is the identification of policies and actions that can prevent environmental security threats from becoming catalysts for tensions, clashes, violence, and conflict.

In implementing its environmental security assessment methodology, FESS recognizes the indispensability of local knowledge and works with local organizations, federal and local government officials, and traditional leaders. FESS primarily directs its findings and recommendations to responsible government officials but also recognizes that civil society, communities, and the private sector can make positive contributions in the effort to address threats to environmental security.

The workshop participants noted the desirability of valuation and quantification in putting forward clear and effective recommendations to policymakers. Recommendations also should be communicated in ways that are consonant with national development strategies. Because of technical challenges and a lack of capacity in the valuation of environmental assets, there is a tendency toward a systematic undervaluation of natural resources and ecosystems. This is an area that needs to be addressed through future research and training.

Energy, Livelihoods, and Environmental Security

One of the most critical components of environmental security in the IGAD region is energy. The multidimensional impact of energy can be seen in four key domains. Energy is an economic good due to its role in income generation role and its contribution to livelihoods. It is a social good because it determines social and individual well-being. It is a political good because it is a factor in maintaining national security and stability. Finally, energy is a cultural good because different societies have evolved various methods, means, and actors for collecting sources of energy.

When energy costs are high, a number of important effects can occur. One impact is the political effect. High energy prices can contribute to social grievances and tensions. Examples of political instability linked to rising energy prices include riots in Liberia in 1979 and a 1973–1974 taxi driver strike in Ethiopia that contributed to the eventual overthrow of Haile Selassie.

High energy costs have an income effect. The poor become even poorer, efforts to reduce poverty are hampered as spending decreases, income disparities widen, and insufficient energy supplies can reduce investment. A trade and mobility effect can also occur. High energy costs often reduce the trade of goods and the mobility of people.

Another impact can occur in the environment: the ecological effect. Costly energy accelerates the pace of environmental degradation when households are forced to depend on charcoal and fuelwood for their cooking, heating, and other domestic needs. Heavy reliance on charcoal and fuelwood destroys forests, which in turn contributes to deforestation, soil degradation, and habitat loss.

In terms of society, effects can include a greater burden on women, who traditionally collect fuelwood. Higher prices may cause them to resort to less efficient sources and increase their time collecting fodder, dung, fuelwood, or other materials.

Finally, the substitution effect can actually make a positive contribution to the challenges resulting from high energy prices. Investment into alternative and renewable sources of energy can help societies use less energy and gain access to more affordable options.

In addition to these effects, high energy prices benefit some but harm many others. Eventually, however, everyone loses as the ecosystem is harmed by inefficient and destructive energy consumption.

The energy profiles of Kenya and Uganda illustrate two different situations within the same region. Kenya has a 68 percent reliance on fuelwood and biomass. In contrast, Uganda has a 93 percent dependence on biomass. For countries with a significant reliance on traditional biomass, energy use is inefficient, and the health concerns can be severe. Traditional forms of biomass typically include wood, charcoal, animal dung, and agricultural wastes. Dwindling supplies of fuelwood are exacerbated by the illegal extraction of natural resources in forested areas.

The concept of energy security is often associated with the disruption of oil supplies. In developing countries, energy security can be defined as ensuring an adequate, equitable, affordable, and environmentally sustainable supply of energy goods and services, as well as creating social, economic, and political stability. Energy security is linked to livelihood security. That is why some argue that undisrupted, affordable, and continuous access to food, energy, potable water, and health services should be addressed in an integrated manner.

Africa's overall access to electricity is limited, but the potential of renewable energy sources, including solid biomass, hydropower, solar energy, geothermal, and wind energy, is promising. Bioenergy, in particular, has much potential. It is produced from a wide array of crops and can be

used for industry, transportation, cooking, and lighting. Bioenergy production can generate employment for farmers. It reduces health problems and greenhouse gas emissions. Women and children spend less time gathering fuelwood. However, there are several challenges preventing an immediate switch. Bioenergy's efficiency is still less than fossil fuels and the cost of production is high. Some of the most widely grown feedstocks have lower energy balances (large energy inputs are required to produce the eventual energy yield) and require vast tracts of land. Sugarcane yields the most energy, but its growing potential in Africa is quite limited. Palm oil, soybeans, and cassava have potential, but only in certain areas. To ensure efficiency and competitiveness, bioenergy crops must be grown only in the most suitable areas. Smallholder bioenergy production and processing is one option for Africa. This could empower smallholder farmers and provide opportunities to minimize problems of monoculture practices.

In the IGAD region, future energy policies need to balance opportunities for smallholder producers while still enabling large-scale investment and development. Sub-regional governments need to develop new and innovative mechanisms for funding technology. In addition, collaborative efforts to strengthen research are needed to modernize traditional forms of energy.

The workshop participants noted that there are some concerns about bioenergy. With concerns over food security, it is important to focus on proper land management and non-food crops, with jatropha one notable possibility. More generally, the challenge of energy diversification on a decentralized basis is one that must be met. Hydropower remains an important untapped source of energy, and solar and wind energy are also promising, although local capacity for repair and maintenance must be strengthened and expanded.

Finally, affordability is a fundamental issue that must be addressed if households are to move beyond collecting fuelwood and other biomass for cooking food and heating homes.

Natural Resource Extraction: Resource Abundance, Development, and Conflict

Although the primary threats to environmental security in the IGAD region come from environmental degradation, extreme weather or climate change, and resource scarcity, other sources of instability can come from the mismanagement of resource abundance. This can be seen in relation to two main types of resources—minerals (e.g., gold, diamonds, oil) and timber. The workshop examined each of these in turn.

African countries have had great difficulty in translating mineral wealth into broad-based economic development that diversifies and strengthens their business, financial, and educational structures and enhances the well-being of large sectors of their populations. Researchers have found that a high-value mining sector often is associated with inflation, economic concentration, corruption, and conflict. It also appears to be an impediment to democracy. At the same time, the successful example of Botswana indicates that these problems are not inevitable. There is nothing inherently wrong with mineral resources, but they bring a number of difficult challenges and questions.

First, there are serious issues of economic governance. How can governments avoid currency distortions and rent seeking? Price fluctuations generate fiscal imbalances and can lead to the

collapse of other economic sectors. (For instance, when Nigeria discovered oil, the agricultural sector collapsed.) Even if collapse is not the outcome, other sectors are nevertheless likely to experience slow growth rates. How should governments address externalities such as declining and unstable commodity prices? At times, commodity prices decrease while national budgets are based on a specific price per barrel or ounce. How can minerals be used to create a stream of wealth that outlasts finite mineral resources? How much ought to be saved, how much should be invested, and in what areas?

Minerals are non-renewable resources, so the sustainability both of extraction and revenue management is challenging. However, in poor countries, the appropriate public policy question is not whether to mine, but where and how. Mineral resources should be invested to ensure that mining contributes as much as possible to longer term growth and development, and should generate new wealth and create new forms of renewable capital. Accomplishing this requires the strengthening of institutional capacities and competencies, prudent management, multilateral partnerships, and carefully considered investment strategies.

Distributional challenges also are highly consequential. If mismanaged, they contribute to grievances that create instability and conflict. Proportionality says that benefits should be accrued in accordance with the amount of contribution to wealth. Utilitarianism says that government should increase the welfare of the greatest number of people. Others evaluate benefits based on the concept of justice. Communities located where mineral extraction takes place expect to see significant benefits. Picking the wrong distributional methods can create serious tensions and disruptions.

There are also inevitable environmental and social questions attached to mineral extraction. How can governments create and sustain mineral wealth that is consistent with environmental quality? How can governments ensure that all of the relevant stakeholders and affected communities have the opportunity to express concerns that are taken into consideration?

Grievances are fueled by bad governance and mismanagement, flagrant corruption, and economic collapse. Governments that are seen as giving preferential treatment to one region over another or using mineral revenues to engender political exclusion are prone to conflict. In some places, governments have favored large-scale mining operations over artisanal miners, leading to community resentment. Elite capture is associated with hard mineral extraction because these resources frequently are geographically concentrated and easy to mine and transport. There are numerous examples in Africa, including Angola, Sierra Leone, Liberia, Côte d'Ivoire, and the Democratic Republic of the Congo.

In recent years, several new ways have emerged to manage mineral resource revenues transparently and equitably, including establishing an independent oversight committee (as in the case of Chad) or joining an international initiative (such as the Extractive Industries Transparency Initiative or EITI). These efforts seek to provide public information and decentralize benefits to include large sectors of the population and broaden benefits to include social infrastructure and services like health and education.

Corporate social responsibility (CSR) is playing an increasingly prominent role in the mineral industry. The "new social contract" for mining means that there is greater attention to community obligations on the part of both investors and government officials. In part, this new agenda is being driven by civil society organizations and community associations, but companies are increasingly incorporating CSR into their planning. International lenders now often expect these practices too, and some are mainstreaming these expectations into project approval. CSR charters need to be further mainstreamed for companies, and "junior" mining companies must be brought into the process. Building a natural resources forum for resource managers to share their experiences also may encourage better knowledge-sharing and the development of best practices.

Recently, China and India have become big players in African minerals. These new investors have raised concerns, but they also may create more policy space to re-evaluate how mining can benefit Africa. In addition to the fundamental role of governments, the participation of civil society organizations and affected communities will be important in this process.

In other parts of Africa, timber has brought both significant revenues and significant conflict. There are many difficulties with timber extraction in Africa, but utilizing these resources will nevertheless be vital for sustainable development, as they generate tens of millions of dollars in revenues. Forests cover a large percentage of Africa, comprising more than 21 percent of the land area. Ecologically, they have many important roles. Forests provide critical habitat for flora and fauna, prevent land degradation, regulate climate, and act as carbon sinks. These ecological functions are harmed during the logging process because entire tracts of land (or concessions) are cleared at once. Although some companies use a process of selective tree-felling, there is some dispute over whether this process is in fact better for the environment.

Logging can lead to conflict when forestry areas are mismanaged, which is especially prevalent in places that lack appropriate incentives. Deforestation is a frequent outcome, and in many areas replanting either has not been done or has been done poorly. In fact, Africa is the most deforested continent in the world. Sixty percent to 85 percent of Africa's original forest is gone.

In addition to the serious and negative environmental consequences, the resulting scarcity of wood fuels conflicts between competing user groups, including both communities and logging companies. Conflicts also have occurred over compensation rights because communities either are not paid enough or because compensation is paid to chiefs, and it may or may not filter down into the community.

Avoiding conflict depends on sustainable logging and forestry, which means felling only some trees and doing so in the least harmful way. There are serious barriers to implementing these best practices, because concessions may be based on improper tree surveys and inventories. Logging may be done at too frequent intervals, or include the felling of tress outside the concession boundaries. Proper supervision by forestry officials is essential to combating these problems.

Effective and transparent government institutions are required to promote sustainable forestry initiatives. Some of the possible policy interventions to reduce the potential for timber-related conflict include enhancing the capacity of forestry officials, increasing the transparency and equitable distribution of forestry revenues, involving local communities and raising awareness

about the problems associated with logging, banning strip logging, banning certain types of wood from being sold, and banning the sale of raw logs. The last of these reduces the extraction of logs and increases revenue by creating employment and backward and forward linkages.

There have been successful attempts to resist logging, generally through the strong opposition of local communities. However, communities often are ignorant of the positive and negative consequences of logging. To promote balanced dialogue, there needs to be more awareness about the link between livelihoods and forests. In relation to environmental and social concerns, timber also can be certified—for instance, through the Forest Stewardship Council. This is not a panacea, however. There are only a couple of African countries currently involved in the initiative, and some countries have indicated that the program may be a non-tariff barrier to trade.

Workshop participants recognized good governance as the central challenge in ensuring that the mineral and timber sectors produce widely shared benefits and prevent instability and conflict. Economic distortions like the so-called Dutch Disease can be avoided and the unfair granting of concessions can be averted by strong institutional oversight. Sustainable logging can be supported by strengthening human resources. It is also possible to expand the definition of benefits to include more than just cash. Social and physical infrastructure can be of greater long-term benefit and create important multiplier effects. In some instances, joint ventures also may be a strategy to increase the knowledge base to the benefit of local interests through employment and training.

The role of corporate social responsibility also was addressed. One noteworthy idea is the Global Reporting Initiative (GRI), which asks countries to report on mining activities, including effects on the environment. Social dimensions are similarly important. When dealing with local communities, discussions must be based on informed consultations, and companies should be expected to do a proper environmental impact assessment (EIA).

An Environmental Security Assessment in Progress: The Lake Tana Watershed

Lake Tana is the second-largest lake in Africa, after Lake Victoria. The ecological integrity and productive potential of the Lake Tana watershed is of great significance to the IGAD region. FESS is currently undertaking an environmental security assessment of the Lake Tana basin, and the workshop explored some of the key issues that are being examined in the course of that assessment.

Lake Tana is the source of the Blue Nile, which flows out of the Ethiopian highlands to Sudan and Egypt. Several of the islands in the lake have medieval monasteries with great religious and cultural significance, and these sites are a key contributor to Ethiopia's cultural tourism. At the same time, Ethiopia's five-year development plan (2005-2010), the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), is based on the concept of economic growth corridors, which make use of natural resources as economic drivers. The Tana-Beles region is the first of the PASDEP's growth corridors. New projects to develop and utilize the lake's water resources and new investments to generate energy and promote industry are coming to the lakeside city of Bahir Dar and the Lake Tana basin. In view of the region's poverty, economic diversification and improvements to agriculture, especially irrigation, are of fundamental

importance. Currently, monocropping is typical in many areas, and communities in the upper watershed are food insecure.

Two intertwined critical concerns in the Lake Tana watershed are land degradation and siltation. Sedimentation and siltation around the lake are the consequence of severe land degradation and high soil erosion. According to land use/land cover maps of the basin, 60 percent to 65 percent of the land is intensively cultivated. Increasing population is decreasing the size of landholdings in the watershed, which are on average about 0.5 hectares or less per person. Only approximately 0.2 percent of the area is covered by forests, and the remainder is used for grazing, agriculture, or has been abandoned. In addition, the area is hilly and rimmed by mountains. Growing populations have pushed families to cultivate on unstable and steep slopes, a practice that is accelerating soil erosion. Torrential summer rainfalls wash whole hillsides and productive lands downstream. Under these conditions of deforestation and intensive use, soil loss rates are high. Essentially, the only area where soil erosion is not occurring is the area of the lake itself.

High soil loss is causing serious damage to communities flooded annually and to the lake itself, which receives large loads of silt and sediments. One area where siltation is visibly apparent is the Fogera plain. In one community, between February 2004 and April 2008, the shore of the lake was filled in with nearly 500 meters of mud and grass. Another example of lake recession is at the mouth of the Gumara River. There, Tana Kirkos used to be an island located offshore, but with the accumulation of silt it is now a peninsula.

The loss of wetlands and marsh areas surrounding the lake is due in part to population pressure. Agricultural fields and grazing lands are located near the lake, and in many places the land is filling in, providing additional areas for food and livestock production. Local farmers and the landless view this situation positively. The local government derives some benefits as it is able to hand out new land to farmers. However, cultivation next to the lake is contributing to pollution and ecosystem destruction.

The lake itself receives water from 60 rivers, including 4 main tributaries. Despite the alarming visible trends and anecdotal evidence, no government agencies or academic institutions have precise and current data that would allow policymakers to be sure of the real dimensions of the threat of erosion and siltation. With the additional threat of climate change, some observers fear that Lake Tana could fill in and dry up completely in a few decades in a manner similar to Lake Chad. The calculations of other analysts find this scenario to be highly exaggerated. Amid this uncertainty, a series of ongoing or planned dam-building, irrigation, horticulture, tourism, and other development projects could be affected or could contribute to the worsening of the situation, if trends continue. Dams may silt up prematurely and irrigation works may fail to reach their intended potential.

Another critical concern is pollution. In the growing city of Bahir Dar, the municipality's untreated wastes are drained directly into the lake by a cemented channel. Plans to develop agroprocessing and floriculture at the edge of the lake have raised further concerns about pollution.

The Government of Ethiopia is aware of these environmental risks and, with the assistance of international donors, is pursuing watershed management in the lake basin and mobilizing resources and training for better data collection. A variety of policies and regulations also have been formulated and enacted, including master plans, conservation strategies, forestry plans, and land-use plans to deal with land degradation at both federal and regional levels. The FESS environmental security assessment seeks to bring to light the interactions among these plans and projects and the ongoing environmental challenges to help policymakers ensure that their efforts to reduce poverty and stimulate economic growth are not undermined by the degradation of natural resources.

Workshop participants discussed these challenges with appreciation for the difficulties in balancing the imperative of economic growth and the long-term environmental health of the Lake Tana watershed. The importance of legal and institutional frameworks was emphasized, with the gazetting of wetland areas surrounding the lake discussed as one possible approach. The paucity of reliable data about the condition of natural resources was recognized as a serious constraint common to the IGAD region. It also was noted that the case of Lake Tana makes clear the interdependence of environmental security in the IGAD member states, especially with respect to transboundary water systems.

Environmental Security and the IGAD Draft Peace and Security Strategy

The workshop concluded the thematic discussions by reviewing the draft IGAD Peace and Security Strategy and its relevance to the themes of the workshop.

While drought and development were IGAD's main emphases when it was created, its current institutional mandate incorporates peace, security, and economic cooperation. The core issues of environment, drought, and desertification are now being handled in a comprehensive way that takes into consideration the introduction of these new issues. Peace and security concerns have attracted the attention of member states because conflict has harmed development in the region, with the most important conflicts having taken place in Somalia and Sudan. Both of these situations required IGAD's response. By necessity, all member states were heavily involved as the two conflicts affected not only these two member states, but also the region at large.

Under the auspices of IGAD, the peace processes in Somali and Sudan have achieved some results. While Somalia still faces problems, there is hope that the achievements can be sustained in Sudan. These examples have helped demonstrate why IGAD needs a strategy to cover peace and security issues. When IGAD participated in these peace processes, it was without institutional frameworks or proven strategies. In the wake of these peace efforts, one of IGAD's academic partners conducted a study to assess the capacity of IGAD and member states to conduct conflict prevention, management, and resolution. One recommendation was that IGAD needed to build a strategy to cover its peace and security efforts. Since then, a number of papers were commissioned on different issues, a series of meetings were held, and two regional workshops were conducted.

After four years of developing the strategy, a draft document has been written. In addition to the member states, civil society, academia, parliaments, and individual experts were consulted during the strategy development process. Member states, involved in the process throughout, are

conducting their first reading of the draft. The result of these discussions is a paper that includes the following 11 "Strategic Action Priorities:"

1) Cooperation in the promotion of good governance and democracy.
2) Strengthening and streamlining preventive diplomacy and conflict resolution.
3) Building capacity to promote security and combat cross-border crime.
4) Cooperation to counter manmade and natural disasters.
5) Cooperation in combating forced and voluntary migration and citizenship issues.
6) Cooperation in respect of transboundary water resources.
7) Cooperation in respect of energy resources.
8) Strengthening conflict early warning and response.
9) Cooperation in the management of environmental and natural resources.
10) Cooperation in boundary demarcation, re-demarcation, and maintenance.
11) Development of a normative framework for implementing the peace and security strategy.

As can be seen from this list, a majority of these priorities touch upon areas encompassed by environmental security, including natural hazards, environmental refugees, shared rivers and lakes, the development and use of energy, pastoralist conflicts, and natural resource management. IGAD believes that to continue as a peaceful region, it must use the natural resources it has to promote peace and security. If these resources are left unmanaged, they could be a source of conflict. For example, cattle-rustling has caused cross-border tensions. CEWARN has provided early warning on this issue for IGAD member states. The security challenges of Somalia have been exacerbated by the failure to realize the benefits of its natural resource endowments, including some 3,000 kilometers of coastline. Given its current instability, the country is vulnerable to the dumping of international waste, illegal fishing, and piracy.

Workshop participants observed that the region contains several transboundary rivers and other natural resources, around which some agreements could be developed to strengthen peace and avoid conflict. For example, if the rivers flowing from Ethiopia to Somalia are regulated in mutually beneficial ways and if the two countries see economic and community-level benefits, peace is more likely to be sustained. Sources of energy such as geothermal and solar also could be shared across countries and contribute to improved understanding and peace.

The workshop also noted the work that IGAD has done with the International Union for the Conservation of Nature (IUCN) to sensitize policymakers about livelihood challenges. When officials visited northern Kenya and looked at environmental conservation activities, cross-border conflicts were an important topic. IGAD could consider mapping common resources and creating committees for joint management of these resources. These issues may be under discussion during bilateral security committee meetings and reviewed as resource management and conflict resolution agenda items.

Lastly, workshop participants observed that climate change was not directly mentioned in the draft peace and security strategy, but a regional approach to addressing climate-related problems facing all member countries could be helpful. Moreover, the region might be able to access more international funding under a regional approach. Given that drought, migration, pastoralism, and other issues are linked to climate change, coordination on this major issue would be beneficial.

V. RECOMMENDATIONS AND THE WAY FORWARD

After the main thematic discussions, the participants addressed the issues raised in the workshop to generate dialogue and feedback regarding the way environmental security could contribute to useful strategies for IGAD and its member states.

During this session, meeting participants were divided into three groups and provided specific questions to consider. The three working groups addressed, respectively: 1) environmental security and conflict early warning, management, and peacebuilding; 2) environmental security and livelihoods (food, water, and energy), minerals, and timber; and 3) environmental security and economic cooperation, transboundary resource management (water, energy), and economic diversification.

Each group discussed the following questions:

- What are some of the key sources of vulnerability within each working group's topical theme or sector?
- Of those sources, which ones might have the potential to trigger or cause instability/conflict?
- Is the Environmental Security Assessment Framework a relevant tool for analyzing environmental security in the region? Are there any actions necessary to ensuring its applicability?
- What recommendations discussed during the workshop or mentioned in the papers should IGAD and its member states try to pursue?

Recommendations
The workshop participants made recommendations in a number of areas based on a shared belief that there is a need to bring increased attention, knowledge, resources, policy development, and program implementation to bear on the serious environmental security challenges faced in the IGAD region.[3]

It was therefore recommended that:

IGAD should take an active role in addressing environmental security challenges and environmentally related conflict issues. The threats to populations in IGAD member states from extreme weather (droughts, floods), water scarcity, land degradation (agriculture, pastoralism), loss of wetlands, and climate change are severe and increasing. In combination with other factors (e.g., poverty, flawed policies, weak institutions, low capacity, inter-group tensions), these environmental problems are significant contributors to conflict in the region.

Problems of environmental insecurity should be integrated into development policy. IGAD should develop mechanisms to assist countries to make their respective development strategies and policies sensitive to environmentally linked conflicts through integrating causes and

[3] A detailed itemization of the small group session reports appears in Annex IV.

consequences of environmental insecurity in development policy. Such integration could commence by developing a set of environmental insecurity and conflict indicators, which should be incorporated into the set of development indicators considered in the formulation of national poverty reduction strategies, macro and sectoral economic policies, and social policies.

IGAD should view environmental security both a challenge and an opportunity in relation to conflict and conflict resolution and incorporate that perspective into its institutional strategies. There is ample evidence from problems of resource scarcity and natural hazards in the IGAD region that environmental threats can increase tensions and serve as the amplifier and trigger for conflict. Conversely, the coordinated management of natural resources (e.g., transboundary water systems, rangelands, climate adaptation) can contribute to conflict management and mitigation. The IGAD Peace and Security Strategy and other relevant institutional strategies should take these considerations into account.

IGAD and its member states should take steps to recognize global climate change as a significant environmental stressor that has the potential to increase the number and intensity of regional conflicts. Given the recognized effects of environmental insecurity on instability and conflict, and the worsening environmental conditions in the Horn of Africa foreseen under the most widely accepted climate change scenarios, IGAD should take the conflict potential of climate change into account in its Peace and Security Strategy and related institutional plans and strategies.

Steps to address environmental security problems on a regional basis should be seen as a catalyst for further economic integration in the IGAD region. Efforts of IGAD member states to collectively manage natural hazards, water resources, energy, climate change, and the development of environmental research and technology will support and accelerate the integration of economic activities, trade, transport, communications, and the movement of goods, services, and people.

The close relationship between environmental security and food security should receive greater attention. The protection of environmental resources and building the capacity of food producers to manage soil conditions, water conservation, organic and inorganic inputs, and pests are critical in enhancing the resilience of food-insecure communities.

Environmental security should be integrated into conflict early warning, conflict management, and peacebuilding. Currently, CEWARN focuses on pastoralist areas. While successful and pioneering, the scope has been limited. There is a need to build early warning systems on threats to environmental security in the region (e.g., locusts, drought, East Coast Fever, severe deforestation, siltation, etc.).

The environmental security knowledge base should be increased, and mechanisms for information-sharing should be further developed and strengthened. There is a need for more scientific knowledge to understand critical environmental change and security linkages. So far, few studies have been conducted to explore this relationship, and a more comprehensive approach is needed to research the different dimensions contributing to conflict. In many cases, there also is a lack of basic data on key natural resources. The development of information

systems and information-sharing can contribute to building confidence and trust among member states.

The capacity to conduct environmental security studies and assessments should be developed. Because of the multisectoral, multidisciplinary, and multilevel nature of environmental security assessment studies, there is a need to develop both institutional and human capacities. The capacity to articulate policies and legislation and enforce them needs to be developed alongside efforts being made to improve analytic and assessment skills. One key aspect is the need to improve the valuation and quantification of natural resources and environmental change in ways that are accessible and useful for policymakers and decisionmakers.

A separate training on the ESAF methodology should be conducted. There is a need to study and better understand the ESAF methodology, its substance, processes, and data requirements. The training should include, among other aspects, a clarification of the complementarities across environmental security assessments (ESA), and environmental impact assessments (EIA), and strategic environmental assessments (SEA).

An IGAD manual for environmental security assessment should be developed. A manual covering the assessment methodology, processes, products, and outcomes is needed.

Environmental security assessment studies of critical ecosystems and shared natural resources should be conducted. IGAD should undertake periodic environmental security assessment studies of critical ecosystems and transboundary natural resources, including such issues as water resources shared by two or more IGAD member countries, pastoralism, climate change, energy, forest management, and wildlife management.

Traditional or local level environmental conflict management mechanisms should be strengthened. Local people and communities have a historic relationship with their lands. There are established indigenous institutional arrangements for managing conflicts in each country setting. Decisions handed down by such peacemakers may not have the force of law, but the force of tradition and community sanction may be no less binding than formal legal decisions.

The Way Forward

The workshop examined and highlighted the relevance of environmental security to development, human security, conflict prevention, and peacebuilding in the IGAD region. Knowledge and expertise were brought together to illuminate key environmental and natural resource challenges, to critically analyze environmental security, and to examine its relevance to the region. Given the chronic problems of instability and conflict the region faces against the backdrop of a highly fragile environment, the workshop underlined the vital importance of environmental security as a policy issue and analytical framework. Pervasive poverty, recurrent drought and famine, massive land degradation, deforestation, low levels of technology, weak policies and institutions, and poor infrastructure and markets are all contributors to severe environmental insecurity.

IGAD and FESS will review the group recommendations and discuss possible next steps for carrying forward the topic of environmental security in the region. They expressed full commitment to exploring mechanisms to implement the recommendations of the workshop.

As a way of carrying the process forward, IGAD affirmed its commitment to taking an active role in addressing environmental security challenges. IGAD also will look closely at how it can assist member countries to integrate environmental security into their development strategies and assist them to work with each other on transboundary environmental problems. Further, IGAD will examine how environmental security can be incorporated into efforts to address the challenges of food security and the opportunities of economic integration. Similarly, IGAD recognizes the relevance of environmental security for the implementation of its Peace and Security Strategy and the strengthening of CEWARN and ICPAC. In particular, IGAD will continue to study appropriate ways to address the serious potential effects of global climate change on development, peace, and security in the IGAD region.

IGAD and FESS will work together to explore ways to increase knowledge, capacity, and concrete policy options to enhance environmental security in the Greater Horn of Africa. In particular, with the input from the meeting in mind, they will consider ways to develop materials and training in environmental security assessment (ESA) methodologies that build awareness, understanding, and local capacity. IGAD and FESS also will examine the possibility of developing environmental security indicators and data that can inform the policy development and decision making. In response to suggestions for pilot environmental security assessments designed for the conditions and needs of the IGAD region, IGAD and FESS jointly will develop concepts for ESAs related to transboundary resources, ecosystems, or climate change. All of these efforts will have as their goal the development of knowledge, capacity, and viable recommendations that can be practically implemented in ways that improve the security and well-being of the populations of the IGAD member states.

Finally, IGAD expressed a willingness to consider reconvening the meeting at some point in the future to review progress and to maintain the momentum forward on the critical environmental security challenges faced by the region.

ANNEX I: WORKSHOP AGENDA
ENVIRONMENTAL SECURITY IN THE IGAD REGION: AN APPROACH FOR BUILDING SUSTAINABLE DEVELOPMENT AND PEACE

5–7 May 2009

Ghion Hotel, Addis Ababa, Ethiopia

4 May 2009

Participant Arrival

5 May 2009

8:00 Registration

SESSION I. OFFICIAL OPENING OF THE WORKSHOP

Moderator: *Dr. Debalkew Berhe, Program Manager, Environmental Protection, IGAD*

9:00 Welcome and Introduction by Workshop Organizers
Dr. Debalkew Berhe, Program Manager, Environmental Protection, IGAD
Mr. Mersie Ejigu, Senior Fellow, FESS

9:10 Statement by the President of the Foundation for Environmental Security and Sustainability
Mr. Ray Simmons, President, FESS

9:15 Statement by the IGAD Executive Secretary
Eng. Mahboub Mohamed Maalim, Executive Secretary, IGAD

9:25 Statement by the Director General of the Ethiopian Environmental Protection Authority
Dr. Tewolde Berhan Gebre-Egziabher, Director General, Ethiopian Environmental Protection Authority

9:35 COFFEE BREAK

SESSION II. ENVIRONMENTAL SECURITY: PRINCIPLES AND PRACTICE

Moderator: *Dr. Debalkew Berhe, Program Manager, Environmental Protection, IGAD*

10:10 The Environmental Security Paradigm: Evolution, Concepts, and Significance
Mr. Jeffrey Stark, Director of Research and Studies, FESS

10:40 Discussion

11:15 Environmental Security: Application to the African Context
Mr. Mersie Ejigu, Senior Fellow, FESS

11:45 Discussion

SESSION III. COMPONENTS OF ENVIRONMENTAL SECURITY IN THE IGAD REGION

Moderator: *Mr. Eugene Telly Muramira, Director, Policy Planning and Information, National Environmental Management Authority, Uganda*

12:10 Water Resources, Scarcity, and Environmental Insecurity
Mr. Gedion Asfaw, Regional Project Manager, Nile Basin Initiative

12:40 Discussion

13:10 LUNCH

Moderator: *Mr. Maina Karaba, Acting Director, Agriculture and Environment, IGAD*

14:40 Environmental Security as an Approach to Understanding and Improving the Food Security Situation
Mr. Ababu Anage Zeleke, Head Ecosystem Department, Environmental Protection Authority, Ethiopia

15:10 Discussion

15:40 COFFEE BREAK

Moderator: *Dr. Daniel Yifru, Director IGAD Peace and Security Division, IGAD*

16:00 Global Climate Changes: Impacts on Human Security and Sustainable Livelihoods in the Horn of Africa
Dr. Balgis Osman-Elasha, Senior Researcher, Higher Council for Environment and Natural Resources, Sudan

16:30 Discussion

SESSION IV. ENVIRONMENTAL SECURITY AND ECONOMIC COOPERATION

17:00 Environmental Security and Regional Integration in the IGAD Region
Mr. Joseph Mukui, Director of Rural Planning, Ministry of Planning, National Development and Vision 2030, Uganda

17:30 Discussion

18:00 Closing
Dr. Debalkew Berhe, Program Manager, Environmental Protection, IGAD

6 May 2009

SESSION V. ENVIRONMENTAL SECURITY ASSESSMENT

Moderator: *Mr. Gedion Asfaw, Regional Project Manager, Nile Basin Initiative*

8:30 An Approach to Environmental Security Assessments: The FESS ESAF Methodology
Mr. Jeffrey Stark, Director of Research and Studies, FESS

9:00 Discussion

SESSION VI. COMPONENTS OF ENVIRONMENTAL SECURITY IN THE IGAD REGION, CONTINUED

Moderator: *Mr. Joseph Mukui, Director of Rural Planning, National Development and Vision 2030, Uganda*

10:15 Energy, Livelihoods, and Environmental Security
Mr. Mersie Ejigu, Senior Fellow, FESS
(Perspectives on the paper prepared by Dr. Henry Aryamanya-Mugisha, Executive Director, National Environmental Management Authority, Uganda)

10:45 Discussion

11:15 COFFEE BREAK

Moderator: *Mr. Seyoum Zenebe Woldemichael, Head, Environmental Protection and Community Development Unit, Ministry of Mines and Energy, Ethiopia*

11:45 Natural Resource Extraction: Environmental Degradation and Human Insecurity
Mr. Antonio Pedro, Director, Eastern Africa, United Nations Economic Commission for Africa

Mr. Kwadwo Tutu, Environment and Development Officer, Sustainable Development Division, United Nations Economic Commission for Africa
(In response to the session topic, Mr. Pedro prepared a paper entitled "The Stakes for Africa in Mineral Resource Development" and Mr. Tutu prepared a paper entitled "Timber Exploitation, Environmental Insecurity, and Conflicts in Africa.")

12:15 Discussion

13:15 LUNCH

SESSION VII. ENVIRONMENTAL SECURITY ASSESSMENT, CONTINUED

Moderator: *Dr. Balgis Osman-Elasha, Senior Researcher, Higher Council for Environment and Natural Resources, Sudan*

14:15 ESAF Work in Progress: The Lake Tana Study
Mr. Jeffrey Stark, Director of Research and Studies, FESS
Dr. Yeshanew Ashagrie, Head Forest Resources Development, Organization for Rehabilitation and Development in Amhara

14:45 Discussion

SESSION VIII. COMPONENTS OF ENVIRONMENTAL SECURITY IN THE IGAD REGION, CONTINUED

Moderator: *Mr. Mustafa Mohamed Garun, Ministry of Foreign Affairs, Somalia*

15:30 The Draft IGAD Peace and Security Strategy
Dr. Daniel Yifru, Director, IGAD Peace and Security Division, IGAD

16:00 Discussion

16:15 COFFEE BREAK

16:15 Pastoralism, Livelihoods, and Conflict
Mr. Tezera Getahun, Executive Director, Pastoralist Forum of Ethiopia
(Paper not presented)

SESSION IX. THE WAY FORWARD

Moderator: *Mr. Mersie Ejigu, Senior Fellow, FESS*
16:45 Embedding Environmental Security in Policymaking in the IGAD Region: Toward an Action Plan

17:00 Formation of Small Group Sessions

17:45 Closing

18:30 Reception

7 May 2009

SESSION X. THE WAY FORWARD, CONTINUED

8:00 Small Group Sessions

10:30 COFFEE BREAK

11:00 Continuation of Small Group Sessions

12:00 Small Group Session Reports

12:30 Summary and Conclusions from the Small Group Discussions: An Agenda for Action
Dr. Debalkew Berhe, Program Manager, Environmental Protection, IGAD
Mr. Mersie Ejigu, Senior Fellow, FESS

13:00 Closing Statements
Mr. Mersie Ejigu, Senior Fellow, FESS
Mr. Ray Simmons, President, FESS
Mr. Maina Karaba, Acting Director Agriculture and Environment, IGAD
Debalkew Berhe, Program Manager, Environmental Protection, IGAD

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ANNEX III:
THE ENVIRONMENTAL SECURITY ASSESSMENT FRAMEWORK (ESAF) FOR COUNTRIES, NATURAL RESOURCE SECTORS, SUBNATIONAL REGIONS, AND ECOSYSTEMS

PHASE I: Profile of the Study Area

OBJECTIVES

Generate an initial overview of the study area to provide background and context for the assessment.

Develop a preliminary assessment of potential political, economic, and social cleavages that may contribute to instability and/or insecurity.

Identify the concerns, grievances, and tensions that may be present. This profile should focus on the local unit of analysis, but incorporate national, regional, and international influences.

METHOD

1. Conduct preliminary research through data collection, literature reviews, and interviews.

TASKS

a. Draft preliminary profile, surveying the following areas for sources of instability or insecurity:
   i. History
   ii. Governance
   iii. Economy
   iv. Society
   v. Regional, national, or international influences
   vi. Relations with neighboring groups
b. Compile an overview of governmental, bilateral and multilateral aid (technical and material) by organization/agency operating in the area.
c. Collect climate vulnerability assessments and materials describing historical adaptation responses to climate-related stress, if any.

PRODUCTS

(1) Preliminary profile of the study area
(2) Matrix of local/national programs and international development assistance

For the purposes of its work, FESS uses the following definitions as a guide:

Environmental security is a condition in which a nation or region, through sound governance, capable management, and sustainable utilization of its natural resources and environment, takes effective steps toward creating social, economic, and political stability and ensuring the welfare of its population.

Environmental insecurity is a condition in which a nation or region fails to effectively govern, manage, and utilize its natural resources and environment, causing social, economic, or political instability that leads over time to heightened tensions, social turmoil, or conflict.

PHASE II: Analysis of Environmentally Linked Data

OBJECTIVES

Analyze three sets of environmentally linked data to focus the scope of the assessment.

Understand the linkages among economic, social, and environmental factors.

METHOD

1. DATA COLLECTION: Complete *enviro-sustainability*, *econo-environmental*, and *socio-environmental* baseline data worksheets, by collecting baseline and trend data through data compilation, literature reviews, and interviews. Disaggregate national-level data to uncover local scarcities and vulnerabilities.

   Where data is lacking, complete the qualitative profile for the three environmentally linked data.

2. ANALYSIS: Perform enviro-sustainability, econo-environmental, and socio-environmental analyses to determine key aspects integral to economic and social stability based on the quantitative or qualitative data collected.

Enviro-Sustainability: A condition in which a nation and/or region, through effective governance, accountable management, and sustainable utilization of its natural resources and environment meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Environmental sustainability does not imply absolute limits. It includes those limitations imposed by the present state of technology and social organization on natural resources and the ability of the environment to absorb the effects of human activity.

Econo-Environmental Analysis: An evaluation of economic activities that are dependent on the natural resource base of a country, such as agriculture and its use of land and water, extraction and refinement of minerals and fuels, exports of raw materials and other environmentally derived goods, power generation, production of finished commodities, and the use of the natural environment for subsistence livelihoods.

Socio-Environmental Analysis: An evaluation of a population's sustained and secure access to the necessary requirements for life. This is assessed through consideration of livelihood security, food security, health, and education.

Qualitative Profile

Enviro-Sustainability Profile

Land and Agriculture
What is the size of the land area under study?
Approximately what percentage is employed for agriculture?
What kind and level of inputs are used by farmers, if any (e.g., irrigation, fertilizer, pesticides)?
What is known and what is perceived by the inhabitants about the degree of land degradation?
What is the type of land on which people are farming (hilly, flat, forested) and what techniques are they using?
What is the average size of farming plots?
What is the state of land tenure (practices and ownership) including differences between men and women, and what is the general predicted trend for land ownership rights and plot sizes in the future?
What are some of the challenges with respect to soil conditions (e.g., erosion, salinization, desertification)?
Is climate change contributing to land degradation? If so, how?

Land and Forests
To what extent is the area forested?
What is the historical and future trend of forested areas in the area under study?
Is there a high or low rate of dependency on fuel wood or biomass?
Is climate change a factor in the condition and sustainability of forested areas?

Water Sources and Availability
Where do the communities receive water from (e.g., well, collection, pipe)?
Are there any sustainability concerns in relation to water withdrawal?
Will current water withdrawal practices be affected by climate change? If so, how?

Water Use
What are the primary uses of water (e.g., agriculture, domestic, industrial, hydropower diversion)?
Which sources withdraw the most water?
Are there any planned projects, changes in population, or other factors that might change the current water usage?

Water Quality
How do communities and health officials perceive the quality of water?
Is it known to be relatively clean or contaminated?
If polluted, what are the sources/causes?
What water-borne diseases are endemic to the area?
How will climate change affect water quality?

Energy
What sources of energy are used and at what levels (e.g., biomass, hydroelectric, fossil fuels, biofuels, solar)?
Where do the energy sources originate from (e.g., local forest or ground cover, public or private electricity agency)?
What sectors consume the most energy (e.g., household, agriculture, industry, transportation)?
Is climate change affecting current or future sources of energy?

Natural Hazards
Are there local authorities responsible for monitoring and responding to hazards (e.g., earthquakes, droughts, floods)?
What are the most serious natural hazards likely to occur in the area under study?
How frequently do natural hazards occur and what is their average level of intensity?
How prepared are communities to respond to a hazard event?
Is climate change contributing to the frequency or severity of natural hazards?

Econo-Environmental Profile

General Economic Indicators
What is the estimated level of income for the average family in the area under study?
Is the area's income more, less, or similar to the country's GNI or GDP per capita?
Is the region experiencing economic growth, stagnation, or loss?
Are there identified causes or influences?
What is the level of employment/unemployment?
Is the informal sector critical to livelihoods?
What factors are contributing to economic stability or instability?

Sectoral Breakdown
What economic sectors employ people and what is their relative importance to the local economy (e.g., agriculture, mining, manufacturing, construction, trade, public administration)?
To what extent are key economic sectors of the economy susceptible to climate change?
What economic roles do women play in the economy versus men?
Does this division of labor result in instability or tensions?
Are there economic opportunities for youths?
If not, do they remain without jobs, migrate, etc.?
Does the area produce any important exports for the country?
To what extent are these exports providing stability to the local economy?
How critical is the natural resource base to any export sector?

Socio-Environmental Profile

Livelihoods
What is the estimated total population of the area?
How rural versus urban is the area under study?
Is the population growing, decreasing, or remaining stable?
Are there obvious forces affecting the demographic profile (e.g., migration, health, economic decline, conflict)?
What is the relationship between arable land and historical, current, and future population?
What is the age distribution of the population?
What ethnic or tribal groups live in the area?
Is there a history of grievance among these groups?
Are there internally displaced persons or refugees inhabiting the region?
In what numbers and from where?
What is the prevalence of female-headed households?

Education
What is the literacy rate for the area and to what extent is it functional?
What is the level of primary and secondary enrollment?
What are the differences by gender for literacy and enrollment rates?

How many teachers work in the area under study, serving how many students?
How does the area compare in relation to the country as a whole?

Food Security
Is the area known for chronic or severe undernourishment and periodic food shortages?
How does the area compare to the country as a whole?
What are the primary items of consumption (e.g., cereals, fruits, vegetables, meats, other)?
Has this changed recently?
What food items are grown locally?
Does the area have access to markets where local or regional food products are sold and traded?
Does the community or do individual households have a food reserve?
Is climate change affecting food security?

Health
What health care facilities does the area under study have access to?
How easy is it to reach a doctor or health center?
What are the primary diseases endemic to the area (e.g., malaria, cholera, TB)?
To what extent is HIV/AIDS prevalence a concern, and what is the general level of awareness?
How does access to health care compare with the rest of the country?
Do inhabitants have access to an improved water source?
Are there any sanitation facilities in the area?
Are changes in the climate contributing to new health problems or exacerbating the prevalence of existing diseases?

TASKS

a. Complete enviro-sustainability data baseline or qualitative profile (e.g., land, energy, water).
b. Complete econo-environmental data baseline or qualitative profile (e.g., PPP per capita, productive sectors, trade, labor).
c. Complete socio-environmental data baseline or qualitative profile (e.g., food security, livelihoods, health).
d. Draft enviro-sustainability analysis based on the baseline data.
e. Draft econo-environmental analysis based on the baseline data.
f. Draft socio-environmental analysis based on the baseline data.

PRODUCTS

(1) Enviro-sustainability baseline and analysis or qualitative profile
(2) Socio-environmental baseline and analysis or qualitative profile
(3) Econo-environmental baseline and analysis or qualitative profile

PHASE III: Analysis of Critical Concerns

OBJECTIVES

Identify Critical Concerns (CCs) and associated contributing factors and environmental linkages.

Understand which underlying issues, sectors, and resources are critical to stability. How are they critical? Who is affected when these are threatened? What are the potential consequences?

Assess environmental governance to examine its impact on CCs in the context of natural resource management.

Critical Concerns: Problematic issues, sectors, or resources that may be directly or indirectly integral to stability based on their value and significance to economic, political, and social well-being.

Environmental Governance: The traditions and institutions by which power, responsibility, and authority over natural resources are exercised.

METHOD

1. IDENTIFICATION: Through the analyses completed in phases I and II, determine the CCs relevant to the study area.

2. ANALYSIS: Analyze each CC to determine key aspects integral to economic, political, and social stability.

3. CONTEXT: Evaluate the impact of environmental governance on each CC to understand its possible mitigating and/or aggravating role.

TASKS

a. Complete a list of CCs.
b. Collect data and relevant written materials for each CC.
c. Assess the strength and effectiveness of environmental governance for each CC through an examination of:
    i) Existing legal and regulatory frameworks
    ii) Sociocultural values
    iii) Institutional structure, capacity, and integrity
    iv) Public access and local governance
    v) Public perceptions of government accessibility, accountability, and effectiveness
    vi) Political will

d. Draft CC analysis and related environmental governmental findings, including identification of contributing factors and their links to environmental security.

PRODUCTS

(1) CC List
(2) CC and Environmental Governance Analysis

PHASE IV: Identify Environmental Security Factors

OBJECTIVES

Further refine and focus the assessment by examining each Critical Concern to identify provisional *Environmental Security Factors* (ESF)—those issues and problems related to the environment that potentially pose a concern for stability or contribute to its creation.

Environmental Security Factor: Issues and problems related to the environment with significant implications for economic and social stability and welfare, potentially posing a threat to security or contributing to its creation.

Identify mitigation efforts, coping mechanisms, and preventive strategies already in place.

METHOD

1. Review the CC list as necessary based on input from interviews and ongoing research and analysis.

2. Departing from the preceding assessment of the relative condition and vulnerability of the CCs, assess security implications of the contributing factors to determine if the CC qualifies as an Environmental Security Factor.

Environmental Security Factors Profile Worksheet *Complete for each CC*			
Insert Name of CC			
Contributing Factors	**Effects**	**Affected Stakeholders**	**Security Implications**

Environmental Security Factors Assessment	
CC Evaluation	**Check Box as Appropriate**
Environmental Security Factor	
Environmental Problem Only	
Significant Non-Environmental Problem	

TASKS

a. Assess security implications of contributing factors to help identify which CCs are ESFs.

b. Profile problems and ESFs according to issues, primary causes, effects/security implications, and affected stakeholders.
c. Identify predicted effects of climate change on the ESFs.
d. List current and future coping strategies reducing the negative effects of the ESFs.
e. Draft targeted question sets for identified ESFs.

PRODUCTS

(1) Revised CC list, as appropriate
(2) ESF profile
(3) List of mitigation efforts for each ESF
(4) List of predicted climate change effects on each ESF

PHASE V: TEST HYPOTHESES

OBJECTIVE

Verify (or revise) the relative significance of each Environmental Security Factor through ongoing interviews and discussions with national, local, and sectoral experts.

METHOD

Test preliminary findings and hypotheses through field research.

TASKS

a. Finalize research on ESFs.
b. Develop list of field interviews.
c. Conduct interviews.
d. Revise ESF list based on field research.

PRODUCTS

(1) Interview list
(2) Revised ESF list

PHASE VI: COMPLETE STAKEHOLDER PROFILE AND ANALYSIS

OBJECTIVE

Identify constituencies interested in and affected by the ESFs.

Assess stakeholder uses of and needs for ESF-related resources.

Determine areas where uses and interests could conflict.

METHOD

Conduct interviews with stakeholders.

TASKS

a. Collect information from stakeholders.
b. Identify impacts of revised ESFs.
c. Assess potential conflict areas.
d. Finalize ESF list.

PRODUCTS

(1) ESF stakeholder chart
(2) Final ESF list

ESF Stakeholder Chart *Complete for each ESF*				
Insert ESF Title				
Stakeholders	**Stakeholder Concerns**	**Degree Affected by ESF (High, Medium, Low)**	**Response Capacity (High, Medium, Low)**	**Points of Conflict**

PHASE VII: Generate Scenarios

OBJECTIVE

Establish the relative urgency and significance of the final list of Environmental Security Factors by developing potential scenarios and possible outcomes.

Create participatory discussions for developing and evaluating potential future scenarios based on local experience and expertise.

METHOD

Test preliminary findings and hypotheses through field research.

Conduct scenario development discussions or exercises with local stakeholders, national officials, civil society, academics, private sector representatives, and donors, when feasible.

TASKS

a. Formulate preliminary scenarios through interviews.
b. Test preliminary hypotheses.
c. Conduct scenario development and evaluation exercise.

PRODUCTS

(1) Develop three scenarios through field research and participatory discussions. One will project likely outcomes if trends remain relatively constant; the second will posit shocks to the system and project likely outcomes given the present capacity to respond; the third will describe potential outcomes if the country were to take many of the necessary steps to address identified environmental security threats. Each scenario will be evaluated in terms of probability and potential impact. The scenarios will incorporate consideration of estimated impacts of climate change, when available.

PHASE VIII: Review of Local/National Programs and International Development Assistance

OBJECTIVE

Identify gaps and target areas to improve the provision and coordination of local, national, bilateral, and multilateral initiatives.

METHOD

In the context of local initiatives and international assistance, review strategies across agencies and assess their role and value in addressing environmental security problems.

TASKS

a. Review local initiatives and development assistance matrix.
b. Compare assistance against potential scenarios and assess results.

PRODUCTS

(1) Evaluation of relevant institutions and assistance with preliminary recommendations for improved coordination and/or targeted assistance

PHASE IX: COMPLETE FINAL REPORT

OBJECTIVE

Review and evaluate appropriate responses to the principal environmental security problems and propose additional or alternative remedial actions.

Provide a comprehensive assessment and recommended actions that present options for policymakers and stakeholders to make informed decisions on environmental security problems.

METHOD

Consolidate ESAF findings, stakeholder analysis, scenario development, and recommendations.

Develop recommendations that consider policy options, entertaining the full range of actions available to policymakers and stakeholders.

TASKS

a. Draft final report.
b. Finalize scenarios.
c. Finalize recommendations.
d. Identify possible dissemination formats and channels.

PRODUCTS

(1) Final report with annexes

ANNEX IV: SMALL GROUP SESSION REPORTS

Group One: Environmental security and conflict early warning, management, and peacebuilding

Vulnerabilities:

- Poor environmental governance
- Climate change
- Poverty
- Lack of education and awareness
- Absence of bilateral cooperation between countries
- Lack of infrastructure
- Lack of early warning systems
- Ethnic differences and proximity
- Fragile environment
- Lack of diverse economic activities

Triggers/Causes of Instability:

- Cattle rustling
- Migration
- Political change
- Media misinformation
- Threatened livelihoods

Incorporating Environmental Security/Conducting Environmental Security Assessments:

- Ensure tool is not too anthropocentric
- Ensure tool is not too data intensive
- Ensure tool is relevant to the domestic situation
- Greater exposure to environmental security and training on the ESAF are needed

Recommendations:

- Strengthen information systems and sharing
- Training skills and development
- Technical support (satellite dishes, etc.)
- Capacity building in environmental security
- Information sharing
- Reinforce bilateral agreements
- Hold regular technical meetings leading to protocols for the region
- Build early warning systems on threats to environmental security in the region (locusts, drought, East Coast Fever, etc.)
- Cooperation in adaptation to climate change

Group Two: Environmental security and livelihoods (food, water, and energy), minerals, and timber

Vulnerabilities:
Food

- Encroachment (forest and wetland for food production)
- Scarcity
- Accessibility

Water

- Scarcity – domestic and productive, accessibility, availability, and distribution
- Quality – pollution, salinity

Energy

- Inadequate supplies of energy
- Over-dependence on biomass-based fuels and associated problems (supply and end-use)
- Inefficient utilization of energy
- Displacement of families/communities in potential mineral/oil production areas
- Environmental problems across the production cycle

Minerals

- Displacement problems
- Distortion/change in livelihoods
- Changes in socio-economic structures
- Potential for health hazards
- Pressure on local facilities/infrastructure

Timber (Forests)

- Deforestation
- Environmental degradation
- Illegal harvesting/logging

Triggers/Causes of Instability:
Food

- Encroachment on grasslands, forests, wetlands, and woodlands
- Scarcity
- Accessibility

Water

- Scarcity and quality of water

Energy

- Inadequate supplies of energy
- Speculation and land grabbing

Minerals

- Displacement of people; no proper resettlement
- Benefits sharing
- Land grabbing and speculation

Incorporating Environmental Security/Conducting Environmental Security Assessments:

- Findings of assessments need to contain monetary values in order to appeal to policymakers.
- Clarify the relationships/purposes of Environmental Impact Assessments, Strategic Environmental Assessments, Environmental Security Assessments, and other planning tools.
- A manual covering the assessment tool is needed to apply it to the region.
- The methodology should be reviewed in greater detail to provide further recommendations.

Recommendations:

- Need to have coherent land use policy and plan in IGAD countries
- Mechanism to support diversification of household incomes is needed
- A series of specific recommendations were provided for each paper

Group Three: Environmental security and economic cooperation, transboundary resources management (water, energy), and economic diversification

Vulnerabilities:

- Lack of cooperative framework for shared water/energy resources and other natural resources
- Lack of trust between member countries
- Informal trade and illegal exploit of natural resources
- Lack of bilateral trade relations
- Lack of appropriate information on transboundary resources
- Shortness of competition

Triggers/Causes of Instability:
Same as vulnerabilities

Incorporating Environmental Security/Conducting Environmental Security Assessments:

- Need to clarify further the methodology for specific recommendations to be made.
- To better understand environmental security assessments and the FESS framework, more training is needed.
- Member countries could further test the methodology, develop a manual, and link it to other strategies such as Environmental Impact Assessments.

Recommendations:

- IGAD should establish cooperative frameworks on energy, water, and wildlife, etc.
- IGAD should undertake assessments of transboundary natural resources. For example, there are water resources linking Djibouti and Ethiopia that could be considered for assessment, alleviating tensions between the two countries.
- IGAD should expedite the implementation of various strategies, such as the ones covering food security, environment and natural resources, and peace and security.
- IGAD should expedite the establishment of a water platform.
- IGAD should undertake periodic environmental security assessment studies.
- IGAD should encourage the joint development of projects based on comparative advantages and synergies. For example, if the region wants to develop hydropower, consider Ethiopia. Food productivity projects could take place in Sudan.
- IGAD could help further research on alternative sources of energy.
- It would be good to conduct a separate training on the ESAF methodology before it is employed in the IGAD region.
- Members should undertake measures to build confidence and trust.
- The international community should support these needs through IGAD.