

**LINKAGES BETWEEN ENVIRONMENTAL
DEGRADATION AND POLITICAL AND SOCIAL
STABILITY IN THE HORN OF AFRICA**

Dissertation submitted to Jawaharlal Nehru University
in partial fulfilment of the requirements for
the award of the Degree of

MASTER OF PHILOSOPHY

TRILOKNATH MISHRA

**CENTRE FOR WEST-ASIAN & AFRICAN STUDIES
SCHOOL OF INTERNATIONAL STUDIES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI - 110067
INDIA
1995**



जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI-110067

Centre for West Asian & African Studies,
School of International Studies

21 July, 1995

CERTIFICATE

This is to certify that this dissertation entitled "LINKAGES BETWEEN ENVIRONMENTAL DEGRADATION AND POLITICAL AND SOCIAL STABILITY IN THE HORN OF AFRICA" submitted by *Mr. TRILOKNATH MISHRA*, in partial fulfilment of the requirements for the award of the Degree of **MASTER OF PHILOSOPHY** of this University, is his original work. To the best of our knowledge, this dissertation has not been previously submitted for the award of any other degree of this University or any other University.

We recommend that this dissertation be placed before the examiners for evaluation.

Prof. Vijay Gupta
SUPERVISOR

Centre for West Asian and African Studies
School of International Studies
Jawaharlal Nehru University
NEW DELHI

Dr. (Mrs.) Gulshan Dietl
CHAIRPERSON

Chairman
Centre for West Asian and African Studies
School of International Studies
Jawaharlal Nehru University
NEW DELHI

to my grand-parents

CONTENTS

	Page No.
List of Tables and Figures	iii
Acknowledgements	iv-v
INTRODUCTION : THE PROBLEM DEFINED	1-15
Social Conflicts and Environmental Degradation	
Chapter - I : ENVIRONMENTAL DEGRADATION IN THE HORN OF AFRICA : PRESENT STATE AND CAUSES	16-38
Environment in the Horn - Ethiopia - Somalia - Sudan	
Chapter - II : ENVIRONMENTAL DEGRADATION AND POLITICAL AND SOCIAL STABILITY IN THE HORN	39-68
Decline in Economy and Agricultural Production	
Environmental Degradation and Social Stability - Breakdown of Rural Life - Population Movements and Disrupted Institutions - The Street Children and the Child Soldiers	
Environmental Degradation and Political Stability - Environmental Degradation and Government Policies - Drought and Famines and its Impact on Political Institutions - Conflict and Confrontation - Environmental Conflicts and Politics	

Chapter - III	:	DYNAMICS OF ENVIRONMENTAL CONFLICTS IN THE HORN	69-97
		Environmental Conflicts in the Horn of Africa - Environmental Conflicts among Pastoralists - Environmental Conflicts Between Pastoralists and Agriculturalists - Environmental Conflicts between Rural and Urban People Environmental Degradation and Ethnic Conflict - Effect of War and Ethnic Conflict on the Environment - Role of Environment in Ethnic Conflict and War - Mountain Terrain - Forest Terrain - Desert Terrain - Human and Ecological Consequences of Warfare in Somalia - Human and Ecological Consequences of Warfare in Ethiopia - Human and Ecological Consequences of Warfare in Sudan	
CONCLUSION	:	EMERGING LINKAGES BETWEEN ENVIRONMENTAL DEGRADATION AND SOCIO-POLITICAL STABILITY IN THE HORN OF AFRICA	98-104
		The Causal Role of Environmental Degradation	
BIBLIOGRAPHY	:		105-130

List of Figures and Tables

List of Figures	Page No.
Chapter - I	
Some sources and consequences of Environmental Scarcity	7
From Damage to Displacement	11
Population Growth & Environmental Stress : A Conceptual Framework for the Countries of Horn of Africa	14
 List of Tables	
Chapter - I	
Table 1 Size and Growth of Population in the Horn	17
Table 2 Growing stocks and Deforestation Rates by Country	18
Table 3 Rates of Environmental Degradation in the Horn of Africa	19
Table 4 Land use Pattern in the Countries of Horn	20
Table 5 Population and Areas of Extent of Aridity in the Horn of Africa	21
 Chapter - II	
Table 1 No. of Livestock ('000, year ending September) Countrywise	40
Table 2 Population affected by Drought (in million), April, 1986	45
Table 3 Growth Rates of Gross Domestic Product (GDP) and Population for Selected Periods	60
 Chapter - III	
Table 1. Reduction in Number of Livestock between 1988 and 1991 in Somalia due to Civil-Strife	88
Table 2 Relative Decline of Livestock During 1977-1992 in Ethiopia	92

ACKNOWLEDGEMENTS

This is my most opportune moment to express my deep sense of gratitude to *Prof. Vijay Gupta* under whose guidance I was able to complete this dissertation. Throughout the study he stimulated my thoughts with his observation and critical comments and effectively moulded my way of presentation. He has been always accessible to remove my doubts and instill confidence in my endeavour.

I am also indebted to *Prof. Anirudha Gupta, Prof. K.R. Singh, Dr. (Mrs.) Gulshan Dietl* and other faculty members who initiated me to basics of inquiry through their interaction at various levels.

I thankfully appreciate the timely help rendered by *Mr. Val Percival*, University College, University of Toronto, *Dr. Sabiha Alam* and *Dr. Subodh Malakar*, Academy of Third World Studies, Jamia Millia Islamia, New Delhi for providing research materials at their command.

Among my friends I am especially thankful to *Mr. Amalendu Misra* who suggested me the broad area of my research and to *Mr Uttam Kumar Sinha* with whom I had lot of discussions on "*Environment and Security*" as he is also pursuing his research encompassing "*Environment and Security*" focussing South Asia.

I am very thankful to members and staff of JNU Library, American Center Library and British Council Library who were always eager to render assistance.

My thanks are also due in particular to University Grants Commission for enabling me an independent research through their Junior Research Fellowship Award Scheme.

I owe a deep sense of gratitude to *Prof. Ganesh Mishra* under whom I successfully completed my graduation and moved to J.N.U., New Delhi.

Special thanks are also due to my wife *Mrs. Bidya Mishra* who has to bear tense agonising moments for my being considerable time away pursuing research. Without her encouragement and moral support it would have been impossible to complete this dissertation.

Last, but not the least, I owe everything to my parents for constant encouragement and support to me all through. My younger brothers *Mr. Onkarnath Mishra* and *Mr Somnath Mishra* and sister *Miss Renu Mishra* deserve special mention for their constant inquiry regarding my health and progress in academic endeavour.

I reserve my appreciation for my friend *Mr. Amitabh Misra* who went through proofreading and *Mr. Govind* and *Mr. Chandan* of *Sanjay Photostat* for their meticulous typing.

21 July, 1995
New Delhi-110 067

(Triloknath Mishra)

INTRODUCTION

THE PROBLEM DEFINED

The issue of environmental degradation has been a major concern in global debate. Factors including natural resources as soil, water, forests, grasslands and fisheries are all prime components of a nation's natural resource base. They also include climatic patterns and physiobiotic cycles that maintain the life support system of all nations. If a nation's environmental foundations are depleted, the idea goes, its economy may well decline, its social fabric may become destabilized. The outcome, all too likely, is conflict, whether in the form of disorder and insurrection within the nation or tension and hostilities with other nations. One can expect this new scope for conflict to expand as more people seek to sustain themselves from declining resource stocks. Today, interaction between environmental and political forces seems to mediate development in many ways as they are closely interlinked to each other. Thus, on one hand environmental problems assume greater political significance, the need for an analytical approach integrating environmental and political understanding becomes more pressing.

Social facts, such as conflict could only be explained by other social facts and not by natural facts, such as the environment. The question arises whether

people living in environmentally degraded areas can come to perceive such degradation as a threat to their way of life (e.g. nomadism) or to their very survival : for example, at times of severe drought, either as a temporary or a permanent turn for the worse in the natural life support systems. It further raises the question that whether such environmental changes for the worse have been the direct cause of conflicts or a contributing (*minor or decisive or triggering*) cause. What kinds of conflict arise - social tensions or disputes (*e.g. over rights to the use of land*) or armed conflicts having local phenomena or reaching the level of government involving entire states and perhaps regions? Do the environmental deficiencies supply the conditions that render the conflict? Materially these deficiencies can be used to pinpoint the source of conflict, and they can shape the nature of conflict. Moreover, they not only can contribute to conflict, they can stimulate the growing use of force to repress disaffection among suffering the consequences of environmental decline.

In the contemporary world much of the social conflict stems from the competition over vital resources. It is the competition which brings the currents of conflicts into play. *Dahlberg asserts that, "Conflict over natural resources*

continues to be a real possibility today and the whole concept of national security has broadened to include these resources.¹ Priages notes that resource conflict appears to be more plentiful as demand increases in the face of environmental constraints and disruptions and as the manipulation of scarce resources becomes a more crucial dimension of international conflict and domestic ethnic conflict.²

Conflict induced environmental degradation relates to the tendency of clashes of interest in order to highlight the most critical environmental tensions in the international arena. These clashes of interest are most of the time related to the intrinsic importance of territory which is governed by its natural resources like minerals, energy sources, water and land itself. *Desmond Morris and Peter Marsh explain territoriality as a deeply ingrained aspect of human life specially if the ecology is such that there is a need to defend access to scarce resources.³* *Kratochurl, Rohrlich and Mahajan identify three different types of disputes over*

-
1. Philip A. Nehre, Natural Resources : Economics, Conservation and Exploitation (Cambridge : Cambridge University Press, 1990) P. 17.
 2. Ibid, pp. 75-77.
 3. Robert Mandel, Conflict over the World Resources (Connecticut: Greenwood Press, 1988) p. 53

*territory.*⁴ A "*Positional-dispute*" which derives from the uncertainty over the exact location of boundary lines. A "*functional boundary dispute*", which involves disagreement over the utilization of a transboundary resource. They also define a third kind i.e. "*territorial dispute evolving from the social-systems*", which relates to the competition and rivalry of one community with similar ethnic and cultural background against another. Mandel further explains that an *ethnic conflict rather than just a desire for more resources has a greater livelihood of producing a broader dispute.*⁵

Competition and rivalry becomes more intense if the resources are scarce. Scarcity is an extremely complex and multifaceted concept and many writers deal only with some of its facts or attempt to define it through rises in the cost of extracting resources or the price of buying them. But for the precise purpose of this dissertation, *scarcity of a given resource for a given nation at a given point of time will be defined as the ratio of the human demand for the resource to the*

4. Bruce Byers, "Eco-regions State Sovereignty and Conflict", Bulletin of Peace Proposals, vol.22, No.1, 1991, pp.65-67.

5. Robert Mandel, "Conflict Over the World Resources (Connecticut : Greenwood Press, 1988) p. 57.

environment's ability to supply it. The demand can be taken as a function of the size of the human population and the resource use per person. The supply can be taken as a function of the physical depletion of resource from the earth.⁶ The two (demand and supply) are highly interactive and the effect is potentially present, exemplified by greater resource depletion frequently connecting with population pressure on resource access and a greater disregard for environmental carrying capacities. To put it briefly scarcity would imply the ecological/physical combination of a relatively depleted resource with a relatively large human population comprising of numerous ethnic groups with various cultural backgrounds and religious attachments.⁷

SOCIAL CONFLICTS AND ENVIRONMENTAL DEGRADATION

The connection between social conflict and environmental degradation can be put forward in three different dimensions. First, where there is a social

6. Michael Chisholm and David M. Smith, eds., Shared Space Divided Space: Essay on Conflict and Territorial Organisation (London: Unwin Hyman, 1991) pp. 181-190.

7. Bjorn Heltne, "Conflicts concerning the control of Scarce-Natural Resources". Contemporary South Asia, vol.2. No.2, 1993 pp.123-149.

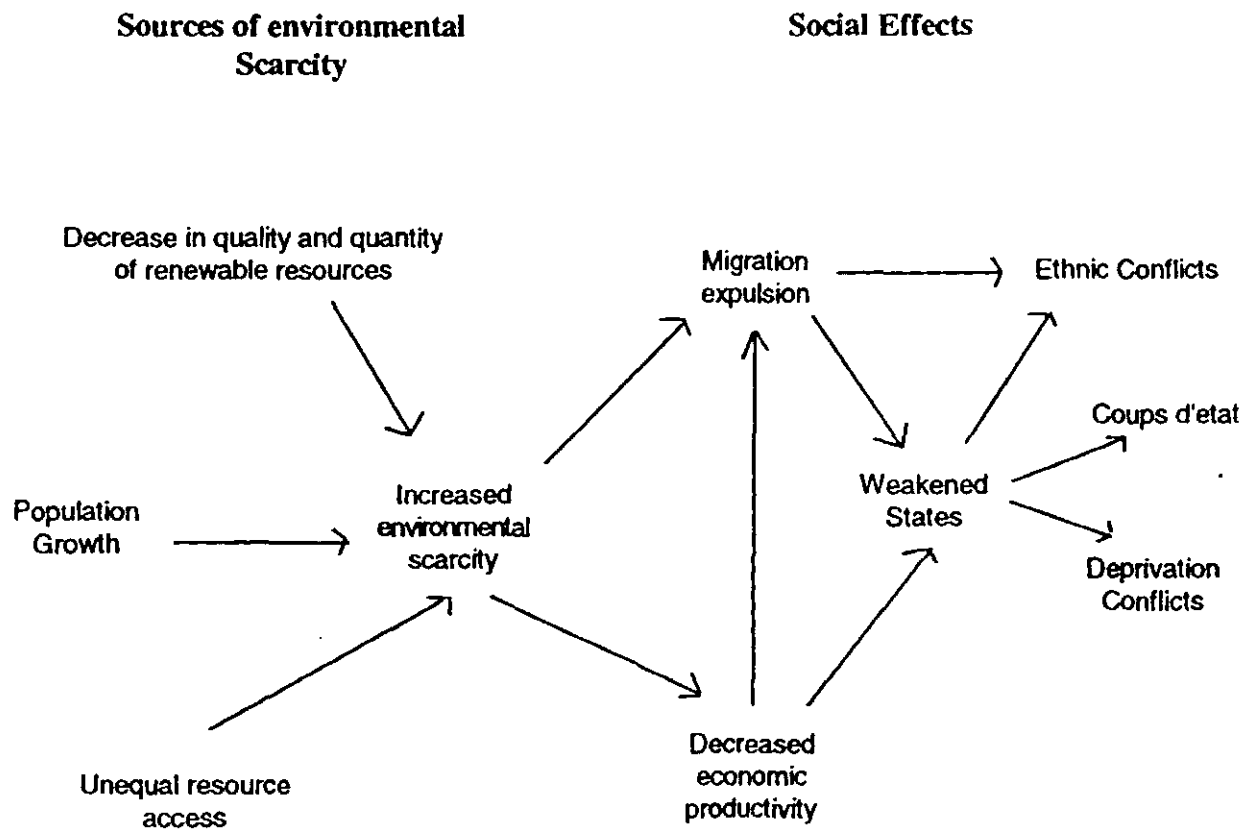
conflict, environmental destruction takes place as a result of it. Second, environmental destruction may itself bring about social-conflict and finally besides being the cause or the consequence of social conflict, environmental destruction may in some cases add fuel to the flames of social-conflict. Researchers and scholars like *Homer-Dixon, Peter Wallenstein and Stephen Libiszewski*⁸ have through their effort brought out a conceptual framework of *conflict and environment, throwing light on both "conflict related environmental degradation" and "environmentally induced social conflicts" which has been analytically outlined in Flowchart 1 (See p.7). It provides the basis for a detailed causal-path analysis of the links between environmental change and conflict.*

According to *Anthony Oberschall*, social conflict is one of the most ubiquitous of events and encompasses a broad range of phenomena, including class, racial, religious and community conflicts plus riots, rebellions,

8. For details Please refer, Thomas F.Homer Dixon, "On the Threshold: Environmental changes as Causes of Acute Conflict", International Security, vol.16, No.2, Fall 1991 pp.76-116.

Peter Wallenstein, "Environmental Destruction and Serious Social conflict: Developing a Research Design", PRIO Report, No.3, May 1992, pp.47-54 and

Stephen Libiszewski, "What is an Evironmental Conflict? Environment and Conflict Project (ENCOP) Occassional Paper 1, 1992, pp.75-82.



Flowchart 1 : *"Some Sources and Consequences of Environmental Scarcity"*

Source: Thomas F. Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases". International Security, Vol.19, No.1, Summer 1994, p. 31. /

revolutions, strikes, marches, demonstrations and protest rallies.⁹ Conflict has a wide range of connotation and is a pervasive social process occurring at all levels of social life but to precisely put it on relationship with environmental destruction, *Peter Wallenstein's* definition becomes very appropriate. He puts forward a situation in which two or more parties strive and compete at the same moment to get hold of the same set of scarce resource. Here, scarcity can be defined as insufficiency of material as well as ideological resources to meet a demand or requirement. Its bizzare character in a conflict is that it has the potential of spawning organised actors and at the same time devising an issue of contention or incompatibility among existing organised actors. As *Wallenstein* further argues, scarcity is the necessary condition to originate the conflict, its materialisation need three essential requirements: organised actors, a minimum of, one incompatibility in their objective and their conscious behavior to achieve the goals.

In a given environmental territory which encompasses natural-resources,

9. Anthony Oberschall, "Theories of Social Conflict", Annual Review of Sociology, vol.4, 1978, pp.291-315.

the conflicting behaviour of social conflict will lead to degradation of the environment and the eco-system of the region. "This acts as a catalyst for migration of people both internal (*exit or displaced population*) and external (*refugees*) and takes the nature of both "*Intra-state and Inter-state tension*".

Some scholars fear that environmental degradation will produce "*waves of environmental refugees*" with destabilizing effects at home and abroad.¹⁰ Much of the focus is on Africa, presumably the most vulnerable area, where some argue, the general pressure of people on land and, in particular, deepening desertification have displaced millions of people and will displace more in years to come.¹¹ This view is supported by following facts.

Life in Africa revolves around the land, and when the land is degraded, the quality of people's lives deteriorates accordingly. Whenever land degradation is coupled with other push and pull factors, like political pressure, armed conflict, ethnic tension, deteriorating services and infrastructure, and growing

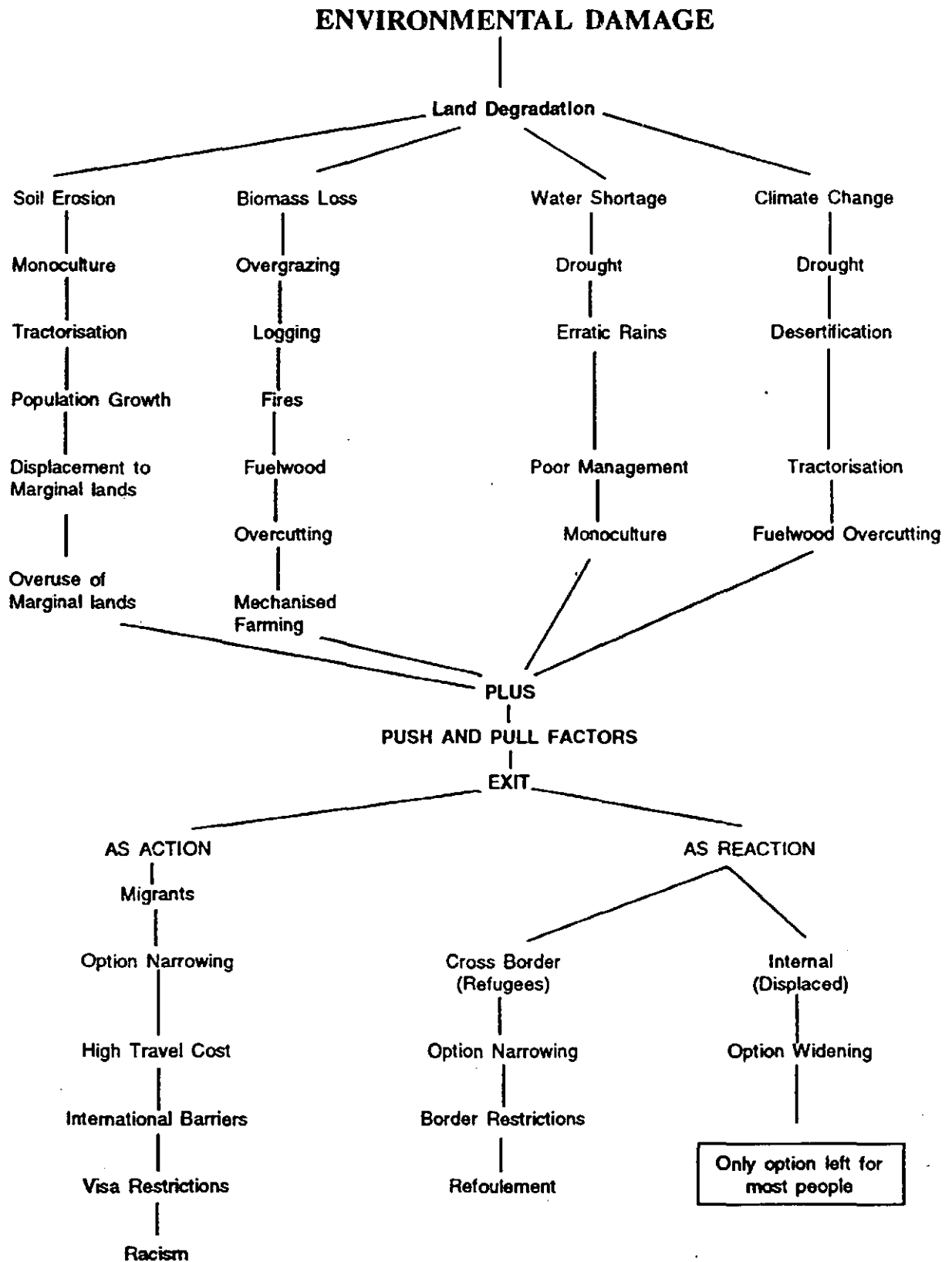
-
10. Thomas F.Homer-Dixon, "On the Threshold : Environmental changes as causes of Acute conflict", International Security, 16 no.2 (Fall 1991) p.77.
 11. For this viewpoint see eds. Anders of Hjort and M.A. Mohammed Salih, Ecology and Politics (Uppsala : Scandinavian Insititute of African Studies, 1989) and Oliva Benett ed., Greenwar : Environment and Conflict (London : the Panos Institute, 1991)

poverty, people begin to move. The *Flowchart 2* (See p. 11) shows the factors leading to the decision to move, and the subsequent narrowing of options which follows such a decision. As restrictions on cross-border movement increase, internal displacement is more likely to be the end result.

There are two different opposing perspectives on migration of people as classified by Astri Suhrke. In one, which can be called minimalist view, environmental change is a contextual variable that can contribute to migration but analytical difficulties and empirical shortcomings make it hazardous to draw firm conclusions while the other perspective which sets out a maximalist view, posits that environmental degradation is direct cause of large-scale displacement of people.¹²

The maximalists produced the first generation of literature on what they call "*environmental refugees*". In a now classic study prepared for the United Nations Environmental Programme in 1985 *Essam-El-Hinnawi* wrote that "*all displaced people can be described as environmental refugees, having been forced*

12. Astri Suhrke, "Environmental Degradation and Population Flows", Journal of International Affairs, Winter 1994 no.2, pp.474.



Flowchart 2. "From Damage to Displacement"

Source: After Mohamed Suliman, "Environmental Degradation and Migration in Africa", ENCOP/IFAA Sudan Paper II, p.9.

to leave their original habitat (or having left voluntarily) to protect themselves from harm and/or to seek a better quality of life."¹³ He then identified three sub-categories : those who temporarily have had to leave their traditional habitat due to a natural disaster or similar event; those who have been permanently displaced and resettled in a new area; and those who have migrated on their own.

A 1988 paper on "*environmental refugees*", written by Jodi Jacobson for the Worldwatch Institute, dramatized the problem and was given wide publicity. Like *EL-Hinnawi*, Jacobson based her analysis on a very general notion of refugees - "*People fleeing from environmental decline*" — and made no distinction between internally and internationally displaced persons.¹⁴ Nevertheless, the paper moved the debate forward by identifying major types of "*natural disasters*" leading to displacement of people namely floods, droughts, toxification, deforestation and rising sea water levels. At about the same time, the report of the International Panel on Climate Change focussed international

13. Essam El-Hinnawi, Environmental Refugees (New York: UNDP, 1985) p.4.

14. Jodi Jacobson, Environmental Refugees : Yardstick of Habitability, Worldwatch Paper no.86, 1988, p.6.

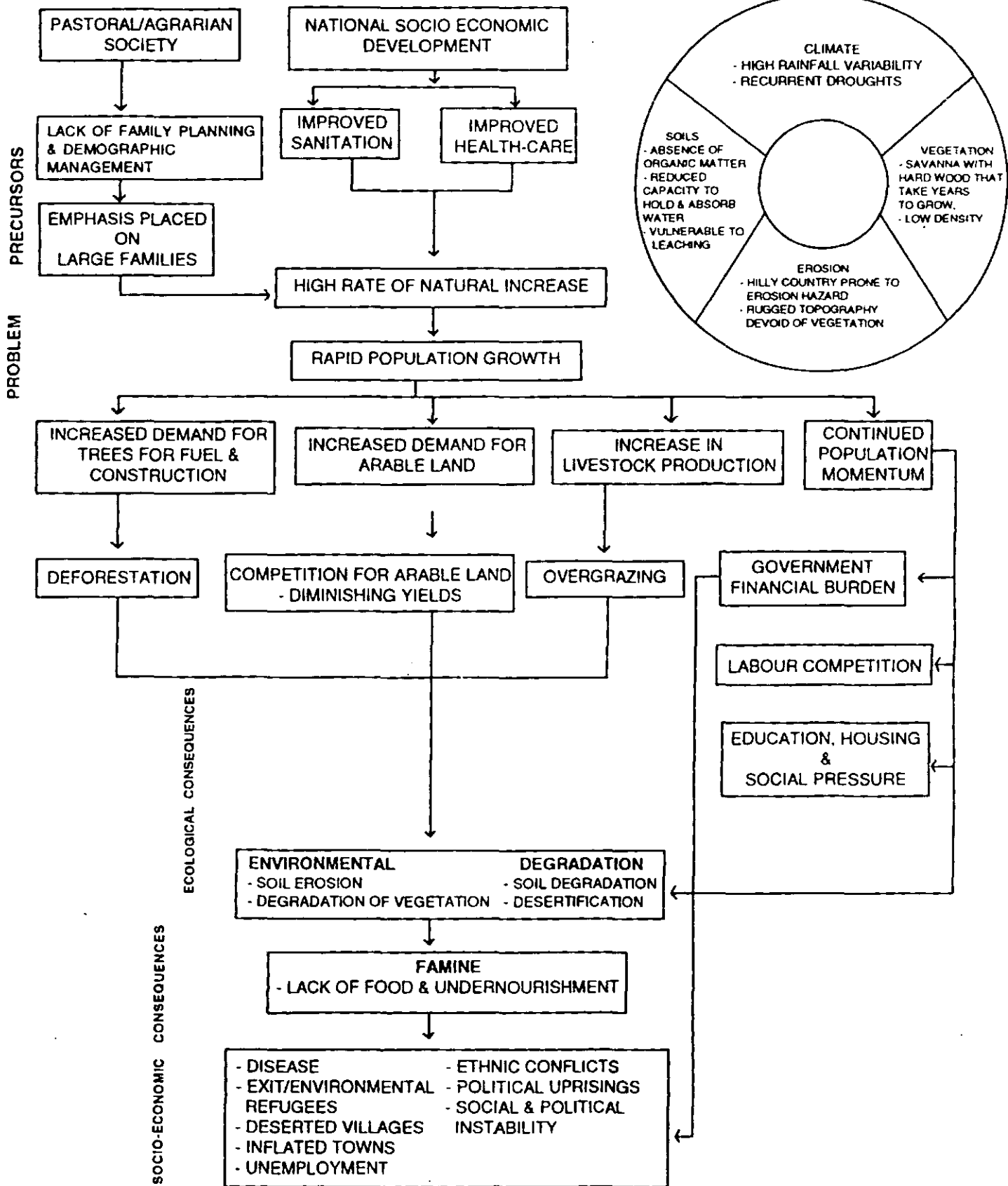
attention on greenhouse effect and rising sea levels, suggesting that tens of millions of people might eventually be displaced. Today, in a broader development perspective, environmental degradation appears as a proximate cause of migration, while the underlying factors are population pressures of resource base.

This study focuses on the Horn of Africa considered as an eco-region consisting of Ethiopia and its neighbours; Djibouti, Somalia, (northern) Kenya and parts of Sudan. *In our analysis we take Ethiopia, Somalia and parts of Sudan because there is acute lack of research materials on Djibouti and (northern) Kenya except for references which we may come across in relation to migration of refugees.*

In trying to understand the intricate relationship between population growth and environmental stress arising out of environmental degradation a conceptual framework has been developed highlighting the four main phases which would form the basis of hypothesis to be tested (Refer Fig.3 on p.14).

**"POPULATION GROWTH & ENVIRONMENTAL STRESS:
A CONCEPTUAL FRAMEWORK FOR THE COUNTRIES
OF HORN OF AFRICA"**

DELICATE ECO-SYSTEM



Our effort is to find out the linkages between environmental degradation and socio-political stability in the Horn of Africa. This study proposes to discuss land degradation due to agricultural practices, deforestation and desertification, water shortage, migration of pastoralists and the concept of environmental refugees and population explosion in relation to environmental degradation.

Subsequently to discuss environmental degradation and political and social stability in the Horn. We would deal in two parts. The first part will discuss - environmental degradation and social stability and the second part would entail environmental degradation and government policies and drought and famines and its impact on political institutions to show the linkages between environmental degradation and political institutions.

We progress to discuss "*dynamics of environmental conflicts in the Horn*" at two levels i.e. environment and ethnic conflict which would focus on deterioration of environment due to war and ethnic conflict and thereby causing political and social instability. In conclusion we entail how far environmental degradation has acted in causing political and social instability in the Horn? Whether it has been an immediate factor or a contributing factor in triggering the political and social instability.

CHAPTER - I

**ENVIRONMENTAL DEGRADATION IN THE HORN OF
AFRICA : PRESENT STATE AND CAUSES**

ENVIRONMENT IN THE HORN

The Horn of Africa (*Ethiopia and its neighbours: Djibouti, Somalia, Northern Kenya and parts of Sudan*) consists of highlands with a good climate and usually sufficient rain for cultivation and mostly lowlands, with often very severe climatic conditions. Agriculturalists live in the highlands, while pastoralists (*the highest concentration of pastoralists in the world live in the Horn*) wander the lowlands in search of water and grazing grounds. For hundreds of years there has been pressure of people from the lowlands to the highlands and the pressure continues even today. For a long time, the highlands managed to absorb such surges of people, but this is no longer the case as the highlands have themselves become an area prone to drought and famine. The situation has become so severe that large parts of these highlands, especially in the north of Ethiopia are today degraded and it is difficult to retain them for agriculture. Process of denudation and deforestation have been accentuated by demographic and other factors as well. The countries of the Horn have shown population growing at the rates of 3.1 to 4.0 per cent a year (*Refer Table 1*). The continued increase in population has created the need for more land

SIZE & GROWTH OF POPULATION IN THE HORN

Countries	Population (millions)				Average Annual Population Change (per cent)		
	1950	1990	1995	2025	1980-85	1990-95	2000-2005
DJIBOUTI	0.06	0.44	0.51	1.16	4.46	3.04	2.88
ETHIOPIA	19.57	49.83	58.04	130.67	2.12	3.05	3.12
KENYA	6.27	23.59	27.89	63.83	3.56	3.35	3.12
SOMALIA	3.07	8.68	10.17	23.40	3.20	3.18	2.99
SUDAN	9.19	25.20	28.96	60.60	3.11	2.78	2.65

SOURCE: WORLD RESOURCE 1994-1995 (New Delhi: Oxford University Press, 1994)]

Table : 1

settlement and agricultural purposes. There is a sustained demand for more construction material and firewood for domestic fuel. (*Refer Table 2 & 3 for Deforestation Rates by countries of the Horn & Rates of Environmental Degradation in the Horn*). All the above factors have led to extreme shortage of habitable land and as a consequence of it more and more people have moved to

over steeper slopes. The natural vegetation cover has been threatened by this migration of people. Due to rugged topography and seasonably heavy rainfall soil erosion has become rampant.

GROWING STOCKS AND DEFORESTATION RATES BY COUNTRY

<u>ANNUAL DEFORESTATION RATE 1981-85</u>				
Countries	Vol. of Forests & Savannas 10 ⁶ m ³	Total Deforestation 1000 ha ⁽¹⁾	Savannas % Savanna Area	Forests % of Forests Area
A LARGELY DESERT COUNTRIES (OVER 66% OF AREA ARID)				
Djibouti	N.A.	N.A.	N.A.	N.A.
Kenya	116	39	1.6	1.7
Somalia	156	13	0.1	0.2
B COUNTRIES WITH OVER 30% AREA IN ARID AND SEMI-ARID ZONES				
Ethiopia	752	88 ²	0.4	0.2
Sudan	997	504	1.1	0.6

Sources: FAO/UNEP (1982), FAO (1984), J.Kotschi et al (1986)

(1) Mean Gross Volume Over Bark

(2) J.Kotschi et al Calculation

N.A. - Not Available

Remark: The given wood volume exclude shrubs and woody fallows.

Table 2

RATES OF ENVIRONMENTAL DEGRADATION IN THE HORN OF AFRICA

COUNTRIES	SAND-DUNE ENCROACHMENT	DETERIORATION IN RANGE LANDS	FOREST DEPLETION	DETERIORATION IN IRRIGATION	RAINFED AGRICULTURAL PROBLEMS	GENERAL ASSESSMENT
DJIBOUTI	.	**	.	.	NA	*/**
ETHIOPIA	.	**	**	.	.	*/**
KENYA	O	**	**	.	.	.
SOMALIA	.	.	.	**	.	.
SUDAN	**	.	.	.	O	.

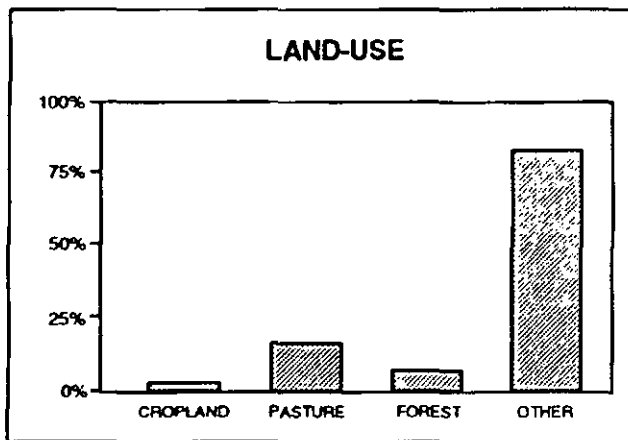
KEY: O = STABLE
 * = SOME INCREASE
 ** = SIGNIFICANT INCREASE
 NA = NOT APPLICABLE

SOURCE(ADAPTED): "DESETRIFICATION CONTROL BULLETIN",
 UN ENVIRONMENT PROGRAMME, NUMBER
 10, MAY 1984, P.26 and National Data.

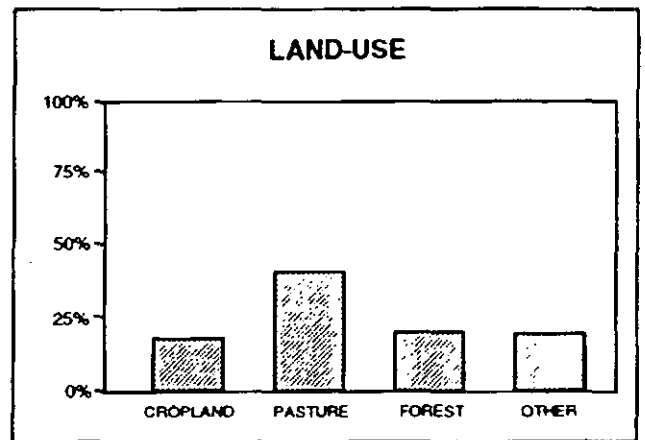
Table 3

Due to the shortage of arable land, the Land has been continuously utilized year after year, (*Refer Table 4 for Land-Use Pattern in the countries of Horn*) thus giving diminishing yields. Animal manure and even crop residues and stubble are used for fuel due to firewood shortages, thus depriving, farm lands of badly needed nutrients and organic matter. The absence of organic

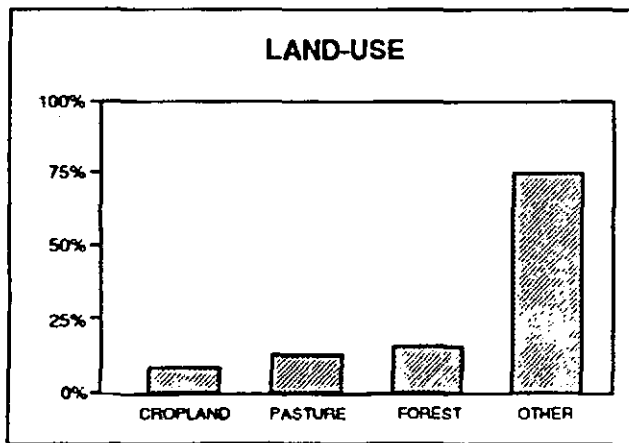
"LAND USE PATTERN IN THE COUNTRIES OF HORN"



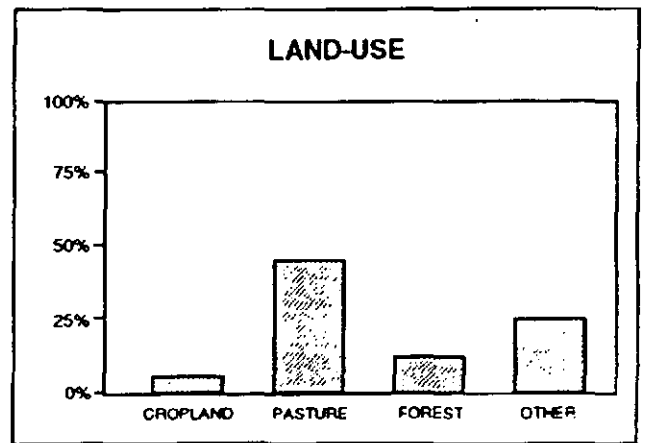
DJIBOUTI



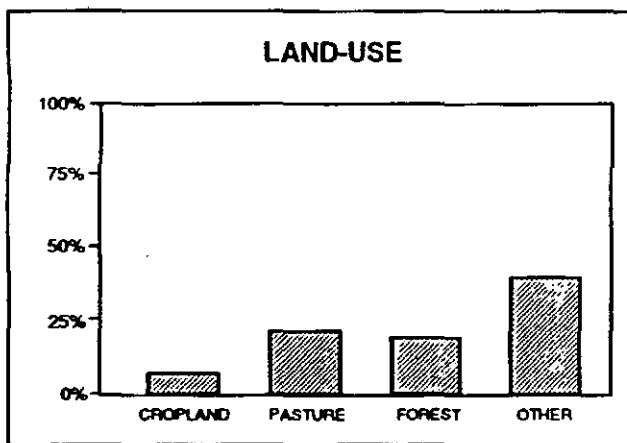
ETHIOPIA



KENYA



SOMALIA



SUDAN

SOURCE: *Environment Almanac: The 1992 Information Please* (Boston: Houghton Mifflin Co., 1992)

Table : 4

matter in the soil has reduced its capacity to absorb and hold water. *Table 5 shows the population and areas of extent of aridity in the Horn of Africa.* During the last few years the productivity of the land has considerably decreased as a result of the factors discussed above.

**POPULATION AND AREAS OF EXTENT OF
ARIDITY IN THE HORN OF AFRICA**

Countries	Population (in million)	Land Area ² (000 ml ²)	Arid & Semi-Arid (000 ml ²)	
DJIBOUTI	0.51	8.5	8.49	100
ETHIOPIA	58.04	471.8	330.24	70
KENYA	27.89	225.0	168.72	75
SOMALIA	10.17	246.2	246.20	100
SUDAN	28.96	967.5	870.75	90

SOURCE : Population Figures from World Resources, 1994-95
(New Delhi: OUP, 1995) p. 268.
ARID-LAND News Letter, No. 10, April 1979
(Office of Arid lands Studies, Univ. of Arizona, Tucson)



DISS
363.70096773
M6877 Li

TH6293

Table 5

TH-6293

Environmental degradation has been so severe in the Horn that the ability to withstand anomalies has completely diminished over years. The region has continuously experienced a prolonged period of drought during which more and more people have supported themselves on a dwindling land resource resulting in further denudation of land surface vegetation. Landforms, soil and vegetation have completely been transformed during such extended drought periods.

The countries of Horn have been also afflicted with drought, famine and civil wars. The consequences of all these have traversed through the borders of one country to another in the form of refugees and migrants. These refugees have become a constant source of internal conflict between new arrivals and established urbanites in the countries of Horn especially Ethiopia, Somalia, Sudan and Djibouti. In 1991, it was estimated by the *UN special Emergency Programme for the Horn of Africa* that there were 22.89 million displaced people in the Horn : 2.172 million people were refugees or returnees, 13.446 million affected by food shortages and drought and 7.22 million displaced by war and political co-ercion.¹ The refugees cannot be easily classified into Sudanese,

1. Maria Brons et al., "War and the Somali refugees in Eastern Haraghe, Ethiopia", in Terje Tvedt ed., Conflicts in the Horn of Africa: human and ecological consequences of warfare (Uppsala: Deptt. of Social and Economic Geography, 1993) p. 47.

Somalis, Eritreans, Ethiopians or Djiboutians simply because most of them are people sharing the burden of

- (a) being in the periphery of the state, both spatially and politically, and
- (b) having closer ethnic, social, political and economic ties with people on the periphery of the neighbouring state. Most of the refugees belong to border societies and moved to areas which traditionally formed extensions to their traditional territories - before the present artificial colonial boundaries were imposed on them.

Dislocation and displacement of large rural population compounded the human misery of the famines that occurred at the peak of the drought during the eighties and continue even today. This situation was in turn exacerbated by political instability in countries like Ethiopia, Somalia and Sudan where sectarian interests and military upstarts were battling with each other to gain the seat of government. The regimes that emerged from the struggle were more concerned about "*management of survival*" than addressing the increasing problems of development which were merely dismissed as "*discontent*".

Government didn't pursue the policies that encouraged herders to check their herds by putting a floor on grain prices and a ceiling on prices that

pastoralists could have received for their livestock pushing the pastoralists into less fertile and marginal areas. The pastoralists were forced into over grazing the land. Whatever vegetation was available had to be used as fodder thus exposing the land to various agents of soil erosion.

The above discussion helps us to acquire a general understanding, of the environmental trends in the Horn and leads us to discuss specific changes that have occurred in Ethiopia, Somalia and Sudan.

Ethiopia

Ethiopia constitutes the largest part of the Horn of Africa.² It spans an area of 1223600 km² (*one of the largest countries in Africa*) and has an altitude ranging from 100 m below sea level to more than 4000 m above sea level. Ethiopia's western neighbour is Sudan; to the south it shares a border with Kenya and to the east and south-east lie the Republic of Djibouti and Somalia. It has a population of 58.04 million³ and comprises of the Amhara — who till 1991 dominated the government, the Tigre, (*who are in commanding position in*

2. Eritrea officially independent since may 1993, is included in most of the reported data because of insufficient information to permit systemic reporting on Ethiopia only.

3. 1995- Estimates - World Resources, 1994-95 (New Delhi : OUP, 1995)

the present government) and many other ethnic groups. The Ogaden region has a population of 1 million, majority is of Somali ethnic origin. Eritreans who attained independence in 1994 number 2.95 million.

The main characteristic of the climate is its erratic rainfall patterns. The south-west highlands receive the highest average rainfall of nearly 1,000 mm of rain a year with the exception of Tigrean plateau, while precipitation decreases towards the northeast and the east where there is a widespread dependence upon the spring rains (*belg*). The lowlands receive less than 500 mm of rain, with the exception of the Baro and Akobo river plains to the south-west, which lie in the path of summer rain bearing winds.

Even in areas with a high mean annual rainfall, the variations can be extreme. Chronically drought prone areas i.e. particularly in the low lying pastoral areas and along the eastern escarpment cover almost 50% of the country's total area and affect about 20 million people.⁴ Drought was at the root of at least ten famine episodes in the last 40 years which have affected large areas and significant portions of the population. In the last 20 years the most

4. T. Desta, Disaster Management in Ethiopia: past efforts and future directions (Addis Ababa : United Nations Sahelian office : Workshop on Drought Preparedness and Mitigation, May 1993)

serious droughts in terms of human sufferings were those of 1972-73 and 1984-85.

The natural vegetation of the plateau and highlands have fallen prey to deforestation and forest vegetation is only found in Bale Highlands and the slopes of Mt. Jiba, to the west of the Addis Ababa. Encroachment by shifting cultivators to newer areas of highlands is today a common phenomena.

According to FAO and the Ethiopian Ministry of Agriculture, about half of the highlands (270,000 km²) are already significantly eroded, of this 140,000 km² are seriously eroded and have been left with relatively shallow soils. Close to 20,000 km² of agricultural lands are so badly eroded that they are unlikely to sustain cropping in future. About 1900 million tones of soil are being eroded annually, of which about 10 per cent is being carried away by rivers and cannot be retrieved, while the rest is redeposited as sediment within the highlands but mostly in places that cannot be of much agricultural use. If this trend continues, land covered by soil with a depth of less than 10 cm will constitute 18 per cent of the highland area by the year 2010. This implies a dramatic fall in yields, frequent crop failures and a high probability of famines, especially in the low potential areas of the highlands. In addition to on-site agricultural production losses, erosion reduces the effective lives of dams and reservoirs through

siltation as well as increasing the extent and intensity of droughts and flooding.

The pressure of population and traditional agricultural practices has exacerbated soil erosion and degradation and have contributed to the denudation of tree cover. In the Ethiopian highlands, population pressures forced the cultivation of increasingly steeper slopes and progressively shortened the fallow between periods of annual cropping. It is estimated that four-fifths of the erosion in the highlands occurs from the over exploitation of croplands, while most of the remainder is caused by the overgrazing of grasslands and deforested areas.

In less than a century, the country's forest and woodland cover has been reduced from 40 percent of the total area to 16 percent in the 1950s and an estimated 4 percent at present. The extensive natural range lands particularly in the Borenn and Ogaden plains in the South are in fact responsible for country's estimated cattle population of around 31 million. Ethiopia has the largest cattle population in Africa, and ranks about 10th in the world in terms of cattle numbers. Most of the livestock is in the hands of peasants and they comprise of about 31 million cattle heads, 23.2 million sheep, 18.1 million goats and 1 million camels.

The fundamental problems of the peasant sector — small plots, erosion, over cultivation — have been worsened by a programme of reform that

nationalized and redistributed land (*individual plots were restricted to 24 areas/10 ha*), forbade the hiring of agricultural labour and fixed artificially low prices for grain. Villagization schemes placed an excessive demand on forest resources for building material. No effort was made to explore and introduce new energy sources in the rural sector so wood and dung remained the only sources of energy. As the demand for such resources grew with population, deforestation and deprivation of land from valuable nutrients increased. Uncertainty about land tenure acted as a disincentive to investments in soil conservation. Inadequate funding for agriculture and its disproportionate distribution in favour of state farms and co-operatives resulted in a shortage of funds for research on appropriate peasant technologies. In general the environment discouraged the integration of conservation activities into the farming practices of peasants. The situation has been exacerbated by a lack of appropriate land use and forest policies. A report from the U.S. Embassy in Addis Ababa in 1978 indicated that the Ethiopian Highlands were losing over a billion tons of top-soil per year through erosion.⁵

5. Lester R. Brown, Edward C. Wolf, "Reversing Africa's Decline", Worldwatch Paper 65, June 1985, p. 7.

Somalia :

Somalia is bounded by Djibouti on the northwest, Ethiopia on the west and Kenya to the southwest. It covers an area of 637, 657 sq.km. Most of the terrain consists of dry Savannah plains, with a high mountain escarpment in the north, facing the coast. The climate is hot and dry with an average annual temperature of 27°C although temperate at higher altitudes and along the coast during June-September with an annual rainfall which rarely exceeds 500 mm in the most favourable regions. Only two permanent rivers the Juba and Webbe Shebelle water this arid land. Both rise in the Ethiopian highlands, but only the Juba regularly flows into the sea. The territory between these two rivers is agriculturally the richest part of Somalia and constitutes a zone of mixed cultivation and pastoralism.

The country's environment is harsh. The northern coastal plains, stretching from the Gulf of Tadjourah to the Mijirtein region are particularly arid and from their scorched appearance are known as guban or "burned". The highlands slope gradually from the north-west and are intersected by low-lying plains and valley towards the south. Most of Somalia is covered by scrub bush that, in places is penetrably dense.

All Somali ethnic groups share a common cultural background, but there are wide differences between the Pastoral Samaale groups — the Dir, Isaq, Hawiya and Darod clans — and the southern sedentary people — the Digil, the Rahanwein, Shidle, Makane and others. The Darod, Hawiya and Isaq are the largest groups but power is found to be concentrated in the Marhen tribe which constitutes about 5% of the population.

In this overwhelmingly pastoral country, permanent settlements are small and widely scattered, except in the agricultural regions. The economy is traditionally based, principally on the herding of camels, sheeps, goats and cattle (the latter mainly in the southern region) which still provides for the subsistence needs of 75% of the population.

There has been much overgrazing of the Somali bush with concomitant desertification of grazing lands, and famines and droughts seem to occur at shorter intervals than in the past. In addition, the various pastoralist groups are not able to move over vast areas as before; competition for water and grazing lands has increased and conflicts between them have intensified. Inter-state disputes have occurred among pastoralists in Northern Somalia and the Ogaden in Ethiopia. This led to outbreak of war in 1977-'78. Since the war, Somalia has been faced with an influx of refugees from Ogaden. There are 750,000 to 1

million refugees, mostly ethnic Somalis (*Cattle growers*) from Ethiopian Ogaden with a similar number of Ethiopian Oromos. In 1984-'85 the number of refugees increased as thousands more entered the country in an effort to escape the drought. The pressure of the refugee on the border has placed an enormous burden on the country, which already has difficulties feeding its own populations.

In Somalia, nearly 60 per cent of the population are nomadic herdsman therefore protecting pasture and scrubland is vital. Rangelands cover 79 per cent of Somalia's land area or about 503,000 sq.km and they provide grazing for 1 million cattlehead, 4 million sheep, 6 million goats and 4 million camels which aptly shows that the livestock industry is of greater relative importance in Somalia than in any other country of Africa. It accounted for about 46 per cent of the gross domestic product and provided for over 80 per cent of the export earnings in 1979.⁶ The likely outcome has been the diminishing of the grass resource that sustains the increasing livestock. Heavy growing, combined with declining rainfall, gradually has changed the character of rangeland vegetation and its capacity to support livestock.

6. Report of the UNSO Rangeland Mission that visited Somalia 27 April-13 May 1981, United Nations Sudano-Sahelian office.

Sudan :

In its sheer size and diversity of geography and people, Sudan resembles the entire African continent. More than 80 per cent of its 25 million population live in rural areas, making up 132 tribes and sub-tribal groups in an area of 2.5 million sq.km. The Nile flows through the Republic of Sudan from South to North and broadly determines the agricultural activity within Africa's largest country. It enters Sudan, South of Juba and spills into the Sudan, the largest marsh in Africa, where a high proportion of its water is lost by evaporation. The Blue Nile rising in the Ethiopian Highlands, has been dammed at Roseires and Sennar, creating an 20,005 sq. km area of intensive irrigation where cotton and sorghum are grown.

There are wide variations in vegetation, ranging from the deserts of the north to the rainforest of the Imatong mountains in the South-east. The topography is generally flat, featureless plateau. The fertile, clay soils of the eastern and central portions of the country are little cultivated due to low precipitation, while the low, woodland of the Savanna of the South supports pastoralists and a large proportion of the national cattle herd. According to June

1993 census Sudan has a population of 24.94 million of whom 71% are rural, 18% urban and 11% nomadic.

Sudan has some 36 million ha of arable land, of which only one third is cultivated, owing to constraints of water availability or the heavy nature of the soil. A further 100 mha are usable as growing land and 76.6% mha are natural forest. Of the 13.5 mha grass cultivated area, some 19 mha are under irrigation, 7.5 mha under rainfed mechanised farming and 4 mha under traditional cultivation.

Some 60% of Sudan's area is occupied by the 11% of the population (estimated at 26 m in 1990) who are partly or fully nomadic - combining cultivating of subsistence crops and some cash crops with seasonal migration, with their herds, along well defined routes, determined by the location of source of drinking water during the wet and dry seasons.

The current livestock population is estimated at 27.7% million Animal Units (AU), much greater than the optimum stocking rate of 22.1 AU (*1 AU = 1 Cow + 1 Calf or their equivalent*) and includes 21.6 million cattle heads, 22.6 million sheep, 18.7 million goats and 2.8 million camels. The range resources have been reduced by expansion of cultivation, by deforestation and by grass

fires, which burn upto 30% of the forage production.⁷

Independence in 1956 created the political conditions for the Jellaba (*who are the urbanized trading class*) to break away from the pump-irrigated cotton schemes of the 1990s (*such as the White Nile schemes*) to large scale mechanised farming of Sorghum and Sesame in rainland areas. The large scale mechanised farming spread from eastern Sudan southwards into Blue Nile Province and then west into southern Kordofan and Darfur.

Today the area under licensed mechanised cultivation, at more than 4 million ha, exceeds that under traditional rainfed agriculture (*3.8 million ha*). The former "supports" some 8,000 largely absentee farmer landlords, while the latter is the livelihood of 2-3 million "peasant" farmers.

The tractorisation and intensification of agriculture dealt a severe blow to traditional peasant farming, because it brought about a gross social and environmental change on peasant and pastoralist societies by abandoning their traditional methods of farming. Low technology agro-pastoralism began to collapse across the central clay plains of northern Sudan, and a new burgeoning category of impoverished people emerged who were dependent on selling their

7. A. Mngabi, Hydrobiology Unit, University of Khartoum (Unpublished Paper),

labour to the merchant class who owned large scale mechanised farms to survive. Many migrated to towns, considerably swelling the numbers of the urban poor. This migration was towards the area of greater food availability - mainly through food-aid.

Another consequence of the rapid impoverishment of the northern Sudanese traditional peasants and pastoralists is the abandonment of relatively benign methods of exploitation of nature (*which included a considerable fallow period between crop cycle*) and their replacement with aggressive methods which assume that *"the natural resources are limitless."* Even forests were decimated in the North by the expansion of mechanized farming and increasing demand for fuelwood. At current rates of consumption vs regeneration and afforestation, all forest areas in Northern Sudan will be denuded by the year 2003.⁸

Degradation of the Nile watershed contributed to flooding in Sudan. The headwaters of the Blue Nile are in the highlands in Ethiopia where a rich and diverse agriculture developed thousands of years ago. Today the highlands constitute 90 per cent of the arable land, supporting 88 per cent of the country's population and 60 per cent of its livestock. But deforestation and poor soil

8. M.Suliman, Greenhouse Effect and its Impact on Africa, IFAA, 1990.

boundary coupled with rapid population growth, have undermined the nations agriculture base.⁹

Because, land degradation has disrupted the hydrological cycle, in which water is recycled to and from the atmosphere through soil absorption and plant transpiration, the entire region is considerably drier than in the past. Extensive floods are not normally a feature of the region downstream of the highlands but in 1988 an exceptionally heavy rainfall together with the watersheds reduced holding capacity allowed a torrent to wreak havoc in the Sudanese plain below.

All the disastrous factors which have descended on Sudan within the life span of one generation can be summarised in :

- Micro and Macro climatic change (the practically continuous Sahel drought since 1967)
- Diminishing and erratic rainfall and accelerating desertification (*the floods and torrential rains of 1988*)
- Near doubling of population in less than than a quarter of century (*15.4 m in 1970 to 25.4 m in 1990*)
- Displacement of livestock numbers within 20 years.

9. "Degradation and Conservation of the Resources in the Ethiopian Highlands", Mountain Research & Development, vol.8, no.2-3, 1988, p.19.

- Deforestation on a massive scale.
- Aggressive expansion of legal and illegal rainfed mechanized farming from 0.42 m ha in 1967 to 7.5 m ha in 1989.

The above analysis shows that the countries of Horn have experienced severe environmental degradation and consequently have been afflicted by severe drought and famines as a result of which there has been large-scale migration of various pastoralist groups to marginal lands and at times from one region to the other putting a severe strain on the economy and acting as a source of conflict with native population. The region has also experienced acute population pressure as the population growth (*nearly 3%*) has caused acute stress on demands of the eco-system and the state.

Specific problem which have added dimension to the crisis is the large scale influx of environmental refugees from Ethiopia and Somalia to small country like Djibouti which has only 3% of agricultural lands. Individual countries like Ethiopia, Somalia and Sudan have experienced internal migrations due to deterioration of environment in the form of shifting cultivators and various pastoral groups. As a consequence of it the vegetation of the plateau and highlands has seriously been impaired and soil-erosion have become a more

common feature. There has been severe competition for scarce resources e.g. water and pasture between pastoralists in the Ogaden region bordering Somalia in Ethiopia resulting in large scale transmigration of pastoralists. With recurring droughts the depletion of vegetative cover in Somalia has increased over the years and the ability to support more and more livestock has receded resulting in erosion of Somalia's economy. In Sudan the drought conditions have affected the water availability and irrigation schemes thereby affecting the farming sector. Consequently aggressive methods of farming e.g. mechanized farming have been adopted - severely impairing the farming sector forcing people in rural areas to switch over to deforestation. Thus, environment in the Horn today is more threatened due to climatic factors, population pressures, migration of people to more and more fertile regions and adoption of mechanized farming in some countries especially Sudan.

CHAPTER - II

**ENVIRONMENTAL DEGRADATION AND POLITICAL AND
SOCIAL STABILITY IN THE HORN**

Environmental degradation in the countries of Horn have increased economic deprivation and disrupted key social institutions which in turn has caused "*deprivation*" conflicts such as civil strife and insurgency (*women and children were the worst affected*). A glaring aspect that contributed to the vulnerability of the population is the fact that the slightest deviation from normal income for most households in the rural sector among the countries of Horn plunged them into destitution. A number of studies have reflected the suffering of the households in the face of oncoming environmental degradation.

DECLINE IN ECONOMY AND AGRICULTURAL PRODUCTION :

The response to the drought in highland Ethiopia and other countries of Horn facing drought had been the distress sale of livestock and other cattle assets, as the options to the peasants are limited by poor communications and intense competition for access to additional and alternative sources of income. Table 1 shows the decline over three consecutive years in the number of livestock in the horn countries except Sudan where there has been a slight increase in their numbers.

No. of LIVESTOCK ('000, year ending September) Countrywise

COUNTRY	1990	1991	1992
DJIBOUTI			
Cattle	-	-	180
Sheep	-	-	450
Goats	-	-	506
Camels	-	-	61
ETHIOPIA			
Cattle	30,000	30,000	31,000
Sheep	22,960	23,000	23,200
Goats	17,200	18,000	18,100
Camels	1,050	1,060	1,070
KENYA			
Cattle	13,793	13,000	11,000
Sheep	6,576	6,500	6,000
Goats	8,000	8,000	7,000
Camels	810	820	810
SOMALIA			
Cattle	3,800	2,000	1,000
Sheep	12,000	8,000	4,000
Goats	18,000	12,000	6,000
Camels	6,000	5,000	4,000
SUDAN			
Cattle	20,583	21,028	21,600
Sheep	20,168	20,700	22,600
Goats	14,843	15,277	18,700
Camels	2,742	2,757	2,800

SOURCE : FAO Production Year-book (Rome respective years)

TABLE : 1

Besides distress sales of farm assets, the options open to a household faced with a shortfall of production over subsistence requirements includes the search for wild food to supplement food supplies; search for off-farm employment opportunities by adults, through migrating to towns in search of charity. Such migrants demanded food, shelter, transport, energy and employment.

During last few decades and particularly since 1970s, the Ethiopian highlands which constitute as a whole 53.6 million hectares or roughly 44 per cent of the total area of the country were effected by environmental degradation. Some 6 million hectares of land was highly degraded, 8.5 million hectares degraded, and 13 million were moderately degraded. This means that more than 20 per cent of the highlands area became unsuitable for agriculture production using the present technology and knowhow and therefore the agricultural production was severely affected.

The gravity of the problem of degradation and agricultural output has

been highlighted by *Bezzabeh*¹ who concludes that within one zone of Wollo province 1.5 million people are living in a hostile environment for agriculture. The situation in terms of degradation in Tigray, northern Shoa, eastern Harrarge, eastern Gondar (and also a large part of highland Eritrea) is believed to be worse than Wollo and it is believed that millions of people have lost their capacity for subsistence and survival.²

Constant deterioration of environment due to recurrent droughts has caused fall in economic standards of Ethiopia. With a GNP capita of 130 US dollars in 1987 and a growth rate of 0.1 per cent from 1965-67, Ethiopia remained as one of the poorest countries in the world in light of the averaged 290 US dollars and growth rate of 3.1 per cent for low income countries. Using similar indicators, we find that the GDP grew by 2.7 per cent from 1965-80 and only by 0.9 per cent from 1980-87 as compared to 5.4 and 6.18 for the low income countries. Agriculture grew by 1.2 per cent between 1965-80 while it

-
1. M.Bezzabeh, Resolution and Land Reform : A Study of the Impacts of Agrarian Changes in Wollo Region (Rome : FAO, ESH, 1980) p.5-6.
 2. M.Bezzabeh, "Attempts in the Transformation of Ethiopia's Agriculture : Problems and Prospects" in Martin Doornbos et al. eds., Beyond Conflict in the Horn: The Prospects for Peace, Recovery Development in Ethiopia, Somalia, Eritrea and Sudan (London: James Currey, 1992) p.147.

declined by 2.1 per cent per annum between 1980-7. During this period Ethiopia's economy has suffered due to environmental degradation, caused by drought which is a recurrent feature.³

Similarly Somalia has experienced decline in economic performance. Agricultural performance in Somalia from 1970 to 1984 has been extremely poor - sectoral output (54% of total GDP) grew by only 0.4% per year, slightly more rapidly in the livestock sector (35% of GDP) and considerably slower in the crop sector (11% of GDP). Per capita food production declined during these years by nearly 3% per year, and the country's dependence on imported farm and cereal aid rose from 40,000 to 350,000 tons.⁴

Since the drought of 1972/1975, Somalia has been subjected to severe climatic changes, which hampered agricultural and livestock production. This further created social instability and civil-strife. It was estimated by the Government of Somalia, in 1974, that about 250,000 Somali nomads were displaced, about 20,000 died, and the country had lost 30 per cent of the entire

3. Ibid p.148.

4. P. Conze and T. Labahn, eds., Somalia : Agriculture in the Winds of Change (epiverlag : Saarbrucken - Schafruche, 1986) p.18.

livestock population. In a nation which had a predominance of nomads, and which earned about 80 per cent of its foreign exchange from livestock, losses of that magnitude placed severe strain on the economy and people's ability to survive. Subsequent droughts (1984, 1988, 1990), war and the total collapse of the state apparatus displaced a million Somalis and made another million destitute.⁵

ENVIRONMENTAL DEGRADATION AND SOCIAL STABILITY :

Environmental degradation disrupts the society disintegrating the social life of common people. In the countries of the Horn the pastoralists were the most severely affected as they had to abandon their homes and move to marginal lands. Men moved out of the family in search of better habitat whereas women later followed them. Destitution crept in which soon led to complete breakdown of social order.

5. Maria Brons et al, "War and the Somali refugees in Eastern Hararghe, Ethiopia", in Terje Tvedt, ed., Conflicts in the Horn of Africa : human and ecological consequences of warfare (Uppsala : Department of Social and Economic Geography, 1993) p.48.

Breakdown of Rural Life : Population Movement and Disrupted Institutions

The flux of environmental refugees and displaced people that followed the last drought in the countries of the Horn was the largest ever witnessed in Africa. By early 1986 nearly 13 million in three countries of the Horn were affected and more than one million of them had to abandon their homelands in search of food and water (Refer Table 2).

POPULATION AFFECTED BY DROUGHT (IN MILLION) : APRIL, 1986

	TOTAL	AFFECTED	DISPLACED
ETHIOPIA	43.6	6.8	0.3
SOMALIA	4.7	0.2	0.2
SUDAN	21.6	6.0	0.9

SOURCE: Office for Emergency Operations (OEOA) : Status Report on the Emergency Situation in Africa as of 1st April, 1986. (New-York: United Nations Organisation, 1986)

Table 2

In such competition to survive under adversity, it is sad and paradoxical that the main losers are the pastoralists and their ecologically balanced way of

strife, between hosts and migrants, between neighbouring communities, between the people and state or between states themselves.

Such large scale displacement was evident in Ethiopia where it is believed that nearly one million Eritreans crossed international borders to live as refugees and nearly quarter of a million people were internally displaced. These displacements tore away at the most profound layers of society by splitting families.⁶

Towards the end of 1988, it was estimated that about 400,000 Somalis sought asylum in neighbouring countries including more than 300,000 in Ethiopia. Many pastoralists and rural populations moved deeper into the northern mountains or across into the Somali-inhabited regions of adjacent provinces in Ethiopia.

One of the results of the civil war in Somalia was displacement of millions of Somalis to Ethiopia using different entry points across the border with Somalia. The total number of registered Somali refugees to the end of 1990

6. Anderberhan W. Giorgis, "The human and ecological consequences of the war in Eritrea", in Terje Tvedt, ed., Conflicts in the Horn of Africa : human and ecological consequences of warfare (Uppsala : Deptt. of Social and Economic Geography, 1993) p.82-83.

was 381,369. In October 1991, the number of Somali refugees was estimated at about 486,995; the majority of whom were from Isaq clan.⁷

The recurrent droughts of past decades led to the deterioration of the living conditions of all Somali-Ethiopian Pastoralists. They lost most of their livestock and were forced to move closer to towns, such as Jijiga. When the Somali (Isaq) refugees were supplied with basic needs, Ogadeeni pastoralists in the area began to feel deceived. Brons et al report that the old disputes between the Somali clans, especially between the Gada bursi and the Ogadeeni, on one hand and the Ogadeeni and the Isaqs, on the other were revived.⁸

In Sudan, too millions of people have been forced to flee their homelands and become displaced (in Arabic Naziheen) in the vast arid and semi-arid areas of the northern half of the country. The total number of displaced "Naziheen" in the Sudan is about four million.⁹ Of this total number more than three million

7. Maria Brons et al, "War and the Somali refugees in Eastern Hararghe, Ethiopia, in Terje Tvedt, ed., Conflicts in the Horn of Africa : human and ecological consequences of warfare (Uppsala : Deptt. of Social and Economic Geography, 1993) p.53.

8. Ibid, p.55.

9. Mohamed Suliman, "Environmental Degradation and Migration in Africa", ENCOP/IFAA Sudan Paper II, p.18.

are women and children. The ratio of women and children to men is even greater for the Khartoum area, at more than 9:1. Besides the internally displaced "Naziheen" there are over 942,000 refugees from neighbouring countries living in the Sudan today and only one third of them receive official assistance from UNHCR.

There are two ethnic groups among the internally displaced; the war Naziheen who are mostly Southerners and drought Naziheen mainly Westerners. Both groups were forced to move to Urban Sudan, to live in Camps or in Slums. Neither one is well tolerated or allowed to integrate into the host communities because of general poverty and meagre work opportunities, of clear ethnic differences, historic hostilities, or simply because Urban Dwellers consider the "Naziheen" a burden on scarce resources and services.

The "Naziheen" find themselves in alien natural and social surroundings. Their traditional skills as peasants and pastoralists are not in demand, and their social habits and language mark them out as rural. Life in camps or as urban outcasts is dreary and meaningless, but there are no real prospects for an early return to the familiar environment and its flora and fauna, or even to the

ancestral burial grounds. Soon their very souls begin to crumble, and destitution drives them to begging, virtual slavery as domestic servants, prostitution or crime.¹⁰

The Street Children and the Child Soldiers

In the countries of Horn, with the collapse of group cohesion the nuclear family has fallen apart. The men run-away from their family responsibilities, the burden on the women increases enormously and the children lose their apprehension of their rural culture. With no chance of integrating into the urban society the children began to abandon the families that cannot feed them. They often end up on the street, where they are at least sure of the mutual solidarity and understanding of other street children.

Those children who don't manage to reach the urban streets are usually abandoned in rural roads and become easy prey for the growing number of African armed groups¹¹ in Ethiopia, Somalia and Sudan.

10. Mohamed Suliman, "Environment Degradation and Migration in Africa", ENCOP/IFAA Sudan Paper II, p.19.

11. In Case of Somalia, some of them addressed as warlords.

Thus in other countries of the Horn, a drop in agricultural, output has weakened rural communities by encouraging to abandon their homes; economic decline has corroded confidence in the national institutions, weakened the tax base, and undermined financial, legal and political markets, shifted class-relations, and upset the traditional balance of economic and political authority between various ethnic-groups.

ENVIRONMENTAL DEGRADATION AND POLITICAL STABILITY :

Environmental Degradation has serious repercussions on the political stability of a region. We analyse how environmental degradation are closely interlinked with government policies and what are the impact of Drought and Famines on Political Institutions.

Environmental Degradation and Government Policies

In Ethiopia, in the inhospitable dry lowlands, the Afar people have traditionally been able to support themselves by carefully using the flood plains of the Awash rivers for their transhumant, pastoral way of life and the land was

their traditional grazing ground for the cattle (*over 10 million*). But the post 1974 political and economic changes acquired (*Rural Land Proclamation of 1975*)¹² vast tracts of land for development of fruits, sugarcane and cotton cultivation without providing alternative sites to the nomadic population of over two million cattle keepers. The uprooted nomads and pastoralists migrated to neighbouring hill devouring them off of the upper crust of the soil. This led to two consequences. *First*, the stage was set for the ecological degradation of the already fragile environment by curtailing the pastoralists traditional mobility and pushing them into less fertile, marginal areas. The pastoralists were forced into overgrazing the land. Whatever vegetation was available had to be used as fodder thus exposing the land to various agents of soil erosion. *Second* this process increased the vulnerability of the pastoralists to drought and famine.

Similarly the introduction of modern commercial agriculture in the Awash lowlands resulted in profound environmental changes, increasing the aridity of

12. For a detailed discussion Please refer Maknum Gamaledin, "Pastoralism : Existing Limitations Possibilities for the Future", in Martin Doornbos, et al., eds., Beyond Conflict in the Horn: The Prospects for Peace Recovery and Development in Ethiopia, Somalia, Eritrea & Sudan (London : James Carrey, 1992), pp.178-184.

the already semi-Arid Awash valley. A series of dams were constructed on the Awash River in order to regulate water flow to provide irrigation for the commercial farms. The reduced flow in the Awash river reduced the size of the flood plain. Additionally, the riparian forests, an important source of forage for Afar herds and an ecological means of maintaining water in the ecosystem were cut down and used for building and fuel on the commercial farms. As roads were built through the Awash Valley to connect the new farms to large cities, the process of deforestation accelerated since wood could be easily transported to a greater distance to fetch higher prices in cities.¹³

A problem closely related to degradation is the extreme fragmentation of cultivable land by political decision of land re-distribution. Fragmentation of holdings, which had its historic basis in the evolution of the land tenure and production systems of the country, increased tremendously since land reform of 1975. This involved land redistribution and land allocation to new adult members of rural households. In one decade the fragmentation of cultivable land increased

13. Kebede Girma and Mary J. Jacob, "Drought, famine and the political economy of environmental degradation in Ethiopia", *Geography*, vol.73, no.318, Jan 1988, p.68.

by at least 25 per cent. This resulted in a situation where by 1989, 51.3 per cent of the farming population had less than one hectare to work. At present the national average landholding per farming household is 1.2 hectares, down from 1.5 only decade ago. With increased fragmentation, given the present level of technology, there is little doubt that output and productivity will also have declined.¹⁴

In Somalia too, the reason for the failure of, Somali rural production systems to meet food security and employment requirements, has been the integration of an export oriented Somali State into the global capitalist economy.

Abdi Samatar has argued this point extensively :

The transformation of northern Somali rural life since the turn of the century entailed more than just agrarian change. It encompassed the entirety of the Somali political economy, material, cultural, and social. The development of peripheral-capitalist "tribal" politics and the mercantilist nature of accumulation spawned a politico-economic development strategy dependent on foreign sources, and led to the exploitation of rural

14. Mulugetta Bezzabeh, "Attempts in the Transformation of Ethiopia's Agriculture ; Problems and Prospects", in Martin Doornbos et al, eds. Beyond Conflict in the Horn: The Prospects for Peace, Recovery and Development in Ethiopia, Somalia, Eritrea and Sudan (London : James Currey, 1992) p.147.

producers in the sphere of circulation for its maintenance and to the demise of rural production.¹⁵

In Sudan, the Government in late 1960s and 1970s pursued the policy of introduction of monoculture, mainly Sorghum for export through large scale mechanised farming. The environmental effects of this mechanised farming has been devastating. Traditional agriculture in the Sudan follows crop rotation systems and fallow periods to conserve and regenerate the fragile land. The owners of mechanised farms, however are interested in quick economic returns; knowing that they can move on to new areas, migrant workers employed on these farms tend to neglect the fallow periods of land for several years. Such monoculture, particularly on marginal soils with low rainfall, degrades the soil quickly. Productivity is high in the first two to four years, after which yields start to decline. The severely exhausted and eroded land is abandoned around the seventh year when the yield falls below profitable levels.

15. Abdi I.Samatar, The State and Rural Transformation in Northern Somalia, 1884-1986 (Madison : Wisconsin University Press, 1989) p.161.

An estimated 17 million hectares of rainfed arable land in the Sudan - have lost their top soil and turned to dust, eliminating the prospect of cultivation in the immediate future.¹⁶ The area east of the Nile has been most affected. Loss of tree and plant cover there has exposed the clay soils to wind erosion and compaction, enhancing surface run-off, particularly in the three months when rain falls, often in heavy storms. Loss of plant cover, particularly of trees producing gum arabic, also contributes to overuse of remaining Woodlands and bushes depreciating the vital local sources of revenue. About 95 per cent of forests in eastern Sudan will be gone soon after the turn of the century.¹⁷

When crop production is less secure, peasants consider animals a good investment. As large mechanised farms have cut into nomads grazing areas and migration routes, the number of livestock has accordingly risen sharply, contributing further to soil erosion and deforestation. From 1962 to 1983, the number of cattle more than doubled from 9.1 million to 21.4 million while the

16. L.A. Lewis and L.Berry, "African Environment and Resources (London : Unwin Hyman Ltd, 1988) p.221.

17. M. Suliman, Greenhouse Effect and its Impact on Africa (London : Institute for African Alternatives; 1990) p.21.

number of sheep trebled from 8.66 million nearly 30 million, bringing the total number of livestock (including goats and camels) to nearly 67 million.¹⁸

Drought and Famines and its Impact on Political Institutions

An analysis of the Ethiopian drought during early 80's reveals clearly the indications which were available as early as 1983 that food production would continue to fall below 6.3 million tons and during 1984 the food production tremendously decreased. The harvest was much below expectations even in the provinces of Shoa, Gajam and Arusi and the grain production fell to 5.1 million tons. All this led to the migration of "environmental-refugees" — the uprooted peasants into the country's lowlands which include the Ogaden Zone straddling the border with Somalia - an area of long standing dispute between the two countries. This large scale migration was one of the contributing factors which propelled Somalia and Ethiopia towards Ogaden war. As a consequence of drought and its effect on declining food production the Ethiopian government

18. M. Suliman, "Civil-War in the Sudan ; From Ethnic to Ecological Conflict" The Ecologist, vol.23, No.3, May/June 1993, p.106.

had to import a minimum of 1.5 million tons of supplies of food in the form of food-aid which further put a strain on foreign exchange and increased the debt.

Besides this large scale migration of environmental-refugees have also been a source of discontent as some of them have joined guerrilla movements. This seems to give them a feeling that they can "do something about the matter", fight back to get their land back. This gives purpose to their lives, instead of vegetating for years in refugee camps or in miserable conditions far from home, in idleness and misery. There is also evidence that refugees have been commandeered by guerrilla movements to become "active-fighters" in liberation wars, e.g. in Eritrea.¹⁹

The condition of drought affected people gave rise to large-scale discontent and as a result opposition to government became stronger and stronger. To offset the opposition demands the government decided to resettle the people from the drought stricken regions in the north to other areas of the country mainly in the South. Government authorities adopted various means to

19. Reidulf K. Molvaer, "Environmentally induced Conflicts? A discussion based on Studies from the Horn of Africa", Bulletin of Peace Proposals, vol.22, no.2, p.181.

persuade unwilling peasants to move to South. Tigray was the focus of this effort, and the Tigray Peoples' Liberation Front saw it as an attempt to depopulate the province and deprive it of support. Therefore it felt justified to take harsh measures, despite the fact that they jeopardised the relief operations in its province.

Another scheme pursued by the authorities was called "villagisation" and involved the uprooting of peasants and pastoralists from their widely dispersed homesteads in order to cluster them in villages chosen by the authorities. The authorities justified the villagisation scheme. They argued that providing relief and services to the people under existing conditions was almost impossible. The region chosen by the Ethiopian authorities to implement this scheme was the Ogaden, Arusi and Southern Balle. All these areas were drought prone and were affected by ethnic conflicts. The pastoralists most of them affected by drought rallied to the various dissident movements opposing Ethiopian government and suffered catastrophic losses as a result. The process of destruction was hastened by the drought which has - plagued the lowlands intermittently for more than a decade. Due to disintegration of pastoralist economy the regime and its

opponents were fighting, over what was actually a no-man's land devoid of any political institutions. Suppressing the rebels became the top priority of the regime and it launched the biggest offensive against the Eritreans in 1982.²⁰ This war proved another failure and encouraged the Eritreans to go on the offensive for the first time since 1978. Political struggle continued and became so strong that in few years Eritreans declared independence and emerged as a separate state.

The continued neglect of the subsistence sector even after drought conditions led to decline in production and loss of labour and given the high rate of population growth, Ethiopia was forced to import food crippling its financial institutions, the backbone of a country's economy.

The country's economic performance indicators during the past three decades showed that the per capita gross domestic product (GDP) decreased from 5 per cent in the 1950s to less than 1 per cent in the late 1980s while the population has been growing. (Refer Table 3)

20. Eritreans were demanding separation from Ethiopia.

**Growth rates of Gross Domestic Product (GDP) and
population for Selected Periods**

Years	Total GDP	Population Growth-rate
1960-64	4.1	2.1
1965-69	5.0	2.2
1970-74	2.6	2.3
1975-79	2.5	2.6
1980-85	-1.0	2.3

Source : Central Statistics office, Addis Ababa, Ethiopia, 1963-1984.

After Asmerom Kidane, "Demographic Consequences of the 1984-1985 Ethiopian Famine", *Demography*, vol.26, August 1989, p.516.

Table 3

Conflict and Confrontation

Far reaching changes were introduced in the land tenure laws and traditional practices by the Sudanese government from mid-1970s. For example, the 1970 *Unregistered Land Act* declared that all land, occupied or unoccupied, belonged to the state and entitlement could no longer be acquired by long use.

Only about one per cent of crop and grazing land was privately owned. The subsequent distribution of "State land" to absentee landlords, encouraged the reorientation of agricultural production for export purposes i.e., favouring cash crops for export rather than food for the internal market. It devastated the social fabric of the traditional farming population as they were unable to sustain their livelihood due to changes introduced while the commercial interest of the Jellaba (*urbanized trading class having considerable economic and political influence*) were strengthened. Continuous extraction of resources through mechanised farming degraded large fertile areas uprooting traditional cultivators and pastoralists.

As a consequence of large-scale mechanised farming internal conflicts emerged at various levels. Conflict between traditional farmers and owners of large farms; conflict among local people living near large farms over scarce cultivable land, and over the obstruction of animal herding routes and conflict between the state, as the major backer of the mechanised farm owners, and small farmers and pastoralists were most evident. With less land available to traditional pastoralists and farmers as well as less family labour because of large-scale

migration, many peasants intensified their traditional cultivation methods, leading to further environmental degradation.

By 1984, at least 4.5 million people had become destitute and homeless. The only way for many of them to survive was to migrate to the towns and relief centres, where food was more available - mainly through food-aid. When victims of drought and famine as well as those impoverished moved to wetter zone in search of survival alternatives, the government resorted to arrests, detentions and forced repatriation as they were perceived as a source of threat to growing opposition to government.

Even in towns these people were treated as third class citizens. The police were mobilised in arbitrary round-ups known as "*Kasha*", which sought to repatriate the migrants to their homelands, despite the fact that the land could no longer sustain them. These uprooted and homeless people are collectively known to the authorities as "*Shamasa*", literally those who have no roof but the sun.

State aggression escalated in line with the growing poverty and resistance particularly on *Shamasa*. Resistance grew with the *Shamasa*, providing the spark for the 1985 popular uprising which, in informal alliance with the impoverished

middle class of public employees, teachers and professionals, overthrew *Jafar Numeiri's* military regime in April 1985.

Environmental Conflicts and Politics

In the countries of the Horn there has been evidences to show that there are links between environmental stress and High politics at central government level as environmental conflicts have led to country wide turmoil and to changes of government.

The Beja of northern Sudan have reacted in various ways when there were environmental stress due to severe drought. *Dahl* found out that the *Beja* looked for scapegoats for their worsening situation.²¹ Environmental refugees from Ethiopia and Eritrea who now competed with the native population (*Beja*) were blamed for causing hardships to *Beja* people. The conflict became violent with the famine due to drought of 1984-1986 when the government tried to conceal and deny the worsening situation. Most of the native *Beja* people lost their

21. G. Dahl, "Who can be Blamed? Interpreting the Beja Drought", paper presented to the International Conference on Environmental Stress and Security, convened by the Royal Swedish Academy of Sciences, Stockholm, 13-15 December 1985, p.23.

livestock and had to explore new means for survival. Consequently they migrated to towns and joined the ranks of growing opposition to the government. Widespread complaint about the neglect of the government during this time of stress was one of the contributing factors in strengthening the movement which finally led to the fall of Numeiri regime in 1985.

Similarly in Ethiopia, the government of Haile Selassie tried to hide the famine of 1972-74. Officials of the government were pre-occupied more with competition for the favour of the Emperor rather than carrying on the administrative functions. They were locked up in the wide ranging corruption under which food items were even exported from Ethiopia when Ethiopians died of hunger. The Emperor and his Ministers often presented the food problem with extreme caution and understatement. Consequently, several months elapsed before even the inadequate decision was translated into action. Thus, famine which was a catastrophic process, made a catastrophic event. The long process of famine which started with a worsening food shortage in a rural condition was allowed to continue, often for a year or longer, to reach its full maturity of mass starvation.

Groups began (e.g. of teachers at the University in Addis Ababa) to organise public support for effective relief effort to deal with the famine victims. It was further publicised by international media particularly BBC. All this created a strong support among the rural masses mostly famine victims that the government was indifferent towards them and therefore should go. The strong support fuelling the opposition to government had definite linkages to the vulnerability to famine which in the long run combined with several other factors culminated in the fall of Emperor *Haile Selassie* in September 1974.

In Somalia, too when on one hand there were large scale nomadic populations made destitute by the 1973-74 drought the government of *Siad Barre* (took power in a coup d'etat in 1969) continued to pursue policies which were conflicting in nature.

The small and medium scale private farmers constituted majority of the farming community in Somalia but the government pursued the policy which favoured large-state controlled farms and discouraged small scale sector. To achieve large-scale crop production through these state controlled farms the government established centrally organised services for effective production

and distribution. The government was very optimistic about their effective production and output and therefore declared that Somalia would attain food-sufficiency by 1980.²² But mismanagement and corruption coupled with continuous neglect of small and medium scale private farmers increased the demand for food as the production of food-crop was never achieved to the optimum level either from state controlled farms or through private small farmers.

Subsequent droughts (1984, 1988 and 1990), civil-war and floods in 1981 put a severe strain on Somalia's economy. Large scale population migration took place. Those who opposed *Siad Barre's* regime in the civil-war began to cross the borders into Ethiopia in 1986 and the Somalis fearing the *President Mengistu* regime in Ethiopia continued to pour into Somalia. It was during this period of influx of population on both sides of the border that the civil-war intensified in Somalia as large number of destitute population arising out of drought joined the opposition movement to overthrow the government. The civil-war in the long

22. Hussain M. Adam, "Somalia: Rural Production Organization and Prospects for Reconstruction", in Martin Doornbos et al. eds., Beyond Conflict in the Horn: The Prospects for Peace Recovery and Development in Ethiopia, Somalia, Eritrea and Sudan (London : James Currey, 1992), p.155.

run reached its climax with the fall of the regime when *Siad Barre* went into exile in January 1991. Thus, the beginning of the civil-war in Somalia could be attributed to large scale population movements due to drought and civil-war in the region and the linkages between the present day crisis and clan politics could be traced to late 1980s.

Environmental degradation in the countries of the Horn have caused economic deprivation due to decline in economy and agriculture production. Continuous decline in agricultural production have disintegrated rural-life as there has been migration of family members to newer areas in search of survival. Influx of people to new areas generated conflicts with the native population causing civil-strife and insurgency. Main sufferers were the pastoralists and among them worst were women and street children. The children were also lured to fight back by joining armed groups against the government.

Environmental degradation also occurred due to pursuance of government policies which were conflicting in nature. Governments in the Horn have pursued vigorously large-scale mechanised farming practices to facilitate exports abandoning small-scale traditional farming. In the process new land laws act

have been enacted and intensive farming practices replaced traditional farming assuming land to be an inexhaustible resource. Since no fallow-period was followed in crop-system, harvest was severely affected impairing the desired self-sufficiency in food-production. Consequently, destitution and dispossessions grew and led to various kinds of conflicts. The government perceived the uprooted peasants and pastoralists as a source of conflicts and often pursued the policy of segregation and resettlement to new areas so that opposition to government remained weak. To suppress dissensions they also adopted co-ercive measures.

Thus, the roots of present day socio-political instability in Somalia, Ethiopia and Sudan could be traced to 1980s when the region was experiencing large-scale population movement due to drought, famines and ethnic-conflicts. The large scale population movement joined the oposition groups which in the long run subsequently became so strong that it was successful for fall of government in Sudan, Somalia and Ethiopia causing political instability.

CHAPTER - III

DYNAMICS OF ENVIRONMENTAL CONFLICTS IN THE HORN

ENVIRONMENTAL CONFLICTS IN THE HORN OF AFRICA

Environmental Conflicts Among Pastoralists

The countries of Horn have experienced environmental degradation at such a level that famines and droughts seem to occur at shorter intervals than in the past.¹ In addition the various pastoralist groups are not able to move over vast areas as before; competition for water and grazing lands has increased, and conflicts have intensified to gain control over the available resources.

Interstate disputes have occurred among pastoralists in northern Somalia (and for a time all of Somalia) and the Ogaden in Ethiopia. *John Markakis*² notes that disputes among the Ishaq and Ogaden Somali have been going on for decades. The history of their long struggles is recorded by various government reports. In 1947 an official report about Northern Somalia had expressed fear of "irreversible ruin" that could hit the soil and vegetation of the area due to congestion and overgrazing. This could lead to increased violence among the

-
1. D.D. Laitin and S.S. Samatar, Somalia: Nation in Search of a State (Boulder, Colorado; 1987) p.1827.
 2. J. Markakis, "The Ishaq-Ogaden Dispute", in A. Hjort and M.A.M. Salih, eds., Ecology and Politics: Environmental Stress and Security in Africa (Uppsala: Scandinavian Institute of African Studies, 1989), pp.157-167.

clans, and the official Report for 1952-53 stated that 80 persons had died in disputes over grazing and watering rights.³ Environmental stress in northern Somalia caused many Ishaq to move into the Ogaden, giving rise to extended disputes between the Ishaq and Ogaden Somalis. Environmental stresses were intensified as the animal population increased vastly with the growing demand for meat exports of the Middle East in the following decades. The whole problem contributed to the tense situation that led to the war between Somalia and Ethiopia in 1977-78. The dispute between the two main clan families has had repercussions on internal Somali politics right up to the present.

*Odingo*⁴ reports that Somali nomadic pastoralists in southern Somalia traditionally used to go for the best pastures across areas in present day Somalia, Ethiopia and Kenya. Colonial authorities didn't bother much if such movements occurred across their respective borders. But with independence the new governments insisted on more strictly regulated border crossings, making it more

-
3. Reidulf K. Molvaer, "Environmentally Induced Conflicts? Discussion based on studies from the Horn of Africa", Bulletin of Peace Proposals, vol.22, no.2, p.177.
 4. R. Odingo, "Nomadic Pastoralist Migrations and Resource use conflicts in the border areas between Kenya and Somalia", paper presented to the International Conference on Environmental Stress and Security, convened by the Royal Swedish Academy of Sciences, Stockholm, 13-15 December 1988.

difficult for nomads to cross into neighbouring countries. This led to political tensions between for example Somalia and Kenya from 1963 (*the year of independence for Kenya and three years after Somalia had become independent*) to 1977 (*the year Somalia went to war against Ethiopia*). This situation should also be seen in the wider context of the Sahelian drought of the 1970s. Attempts to settle the nomads resulted in their land becoming overgrazed, and desertification set in, especially where there were improved watering facilities. Such a situation had been avoided earlier when nomads would move away from degraded areas to more fertile lands. Now for e.g., Kenya could offer better facilities for nomads, with veterinary services, markets, schools, health facilities, cattle dips, etc. This attracted many Somali pastoralists to cross the border illegally.

Those who continued the old pattern of keeping as many animals as possible found that with drought and population growth they soon exceeded the carrying capacity of the land, which as a result began to deteriorate severely. This led to general impoverishment and famine in the area, with armed conflict as the potential outcome.

There has also been international tension on the borders between Uganda,

Kenya and Sudan when nomads crossed borders in search of grazing for their flocks.⁵

Environmental Conflicts Between Pastoralists and Agriculturalists

During the drought in Ethiopia in the mid 1980s, *Afar pastoralist* invaded settled agricultural areas, which led to clashes between the two groups. As the land traditionally used by the pastoralists had become so degraded, many of the Afar became despaired of ever returning to their traditional way of life, and the conflicts with neighbours became protracted.⁶

These conflicts also involved people who had settled after having previously lived as nomads, and people who were still continuing their former pastoralist way of life, increasing their flocks as much as possible - for reasons of traditional prestige as much as for economic reasons. This over grazing first degraded the land and then led to disputes that threatened to lead to more serious fighting.

5. D. Johnson and D. Anderson, eds., The Ecology of Survival: Case studies from Northeast African History (London; 1988).

6. Ibid.

*Ahmed*⁷ surveys that developments in the Sahel region (*which in the east extends to the Horn of Africa*), taking most of his examples from Sudan. He writes that the continuing deforestation, desertification, drought and population growth in the region have led to widespread ecological degradation and have limited the food production potential. In addition, over-intensive farming and over stocking of animals, with no consideration for the carrying capacity of the land, have caused environmental stress even in previously fertile areas. This has led to an unprecedented migration of people and domestic and wild animals, and in turn, has brought more ecological stress in new areas. *Ahmed* also finds that many development projects, including those intended to ameliorate the ecological situation, have contributed to further environmental degradation and resulted in "major conflicts".

The present situation in the Sudan was predicted from observed indicators as early as the 1940s. But nothing was done to reverse the situation, neither then nor after independence in 1956. The local inhabitants in marginal lands continued to use the land as if its resources were inexhaustible. This trend

7. A.G.M. Ahmed, "Ecological Degradation in the Sahel: the Political Dimension", in A.Hjort and M.A.M. Salih, eds., Ecology and Politics : Environmental Stress and Security in Africa (Uppsala: Scandinavian Insittute of African Studies, 1989) pp.89-99.

continued and in 1970s, Sudan observed a decade of expanded agricultural production. This scheme was concerned mainly with cash crops production intended for the world market. The initial success of this scheme resulted in the cultivation also of poor marginal land traditionally used by nomads. This started the process of land erosion and degradation that has not yet been reversed. It also drove pastoralists away from their areas and congested them into increasingly smaller and poorer areas for grazing, unless they gave up their way of life and became wage labourers. *Ahmed* sums up the situation in following words:-

This competition for land led to conflict between nomads and mechanised rain-fed scheme owners. Nomads had to fight their way through these schemes in their seasonal migration since the schemes have taken areas which the nomads' traditional migration routes used to cover. This also led to competition between settled villagers and nomads who were in the past maintaining peaceful symbiotic relations.⁸

By the late 1970s, both nomads and settled villagers from marginal areas of the semi-desert region started to move south in order to survive. This resulted

8. A.G.M.Ahmed, "Ecological Degradation in the Sahel: the Political Dimension", in A.Hjort and M.A.M.Salih, eds., Ecology and Politics : Environmental Stress and Security in Africa (Uppsala : Scandinavian Institute of African Studies, 1989) p.98.

in political instability throughout the region, frequently nearing to the point of tribal wars, due to different management systems of available resources. One example is the continuing conflicts between the "*Bani Hebla*" cattle herders and the settled villagers and the Rizegat camel herders in northern Darfur. Many have died in conflicts between them since 1976. *Ahmed* concludes that the ecological degradation in the Sahel has "generated unprecedented mobility and led to conflicts in almost all parts of the Horn".

Environmental Conflicts Among Agriculturalists

Several cases of conflict between different groups of settled agriculturalists caused due to the competition over deteriorating soils are known from the Horn of Africa. This has also led to continuous migration between rural areas, sometimes over international borders. There has also been some movements towards the towns, although farmers have generally put up a fight before they moved. Perhaps one of the most interesting developments has taken place in Sudan, over several decades. There has also been competition between "traditional" farmers and "modern" mechanized rainfed "schemes". Such competitions dates back to colonial days. It has been intensified ever since

independence (1 January 1956). The cultivation of cash crops for export became more important with the increasing need for foreign currency to buy foreign goods and to repay foreign loans. More and more land came under mechanized cultivation, and as the state increasingly took over these schemes in the form of state farms, both "traditional" and other private farmers were pushed onto more and more marginal land. Many of them gave up their way of life and began to sell their labour to state or to other industrialized farms. Many moved to towns. Increasing number of conflicts followed in the wake of these developments. The population became disappointed and angered over the broken promises and false hopes given by the government in relation to the state and other modern agricultural schemes. The failure of these schemes seemed to be partly due to the one sided emphasis on technical factors and the neglect of social and environmental factors in the development process.⁹ In the process, a largely migrant seasonal agricultural labour force was formed, which has gradually developed into a national labour market. Competition for scarce jobs provided a pool of cheap labour. It has also increased competition and tension among

9. I. Kursany, "Peasants of the Nuba Mountain Region", Review of African Political Economy, no.26, 1983, pp.35-44.

agricultural labourers.¹⁰ Conflicts of interests between tenant farmers and agricultural capitalists (many of them outsiders) led to an "incident of horrific proportions". *Ali* writes that at Jouda in 1956, just after independence, due to these conflicts there were high number of casualties".¹¹

Environmental Conflicts Between Rural and Urban People

Environmental stress has given rise to migrations to towns in many parts of the Horn of Africa. After the famine in Ethiopia in 1972-74, many of those who survived the Wollo population (which had been the hardest hit) found their way to towns. For a long time they occupied jobs for which there was no real demand, surviving on starvation incomes. There was considerable friction between new arrivals and more established urbanites; in the end many trickled back to rural areas. But the government became so cautious of possible conflicts that they used the armed forces to try to stop these environmental refugees from entering towns.

-
10. J. O'Brien, "The Formation of the Agricultural Labour Force in Sudan", Review of African Political Economy, no.26, 1983, pp.15-34.
 11. T.M. Ali, "The Road to Jouda", Review of African Political Economy no.26, 1983, pp.15-34.

In Sudan, refugees from Eritrea, often tried to make a living in or around towns, including Khartoum. Also internally:

a large number of rural areas have been abandoned and the local population has moved to the towns on or near the banks of the Nile, or in many cases, towards the capital, i.e. greater Khartoum.... The state apparatus has failed to handle the situation and political chaos and economic disaster seem to be the main features at present in everyday life.¹²

An informative example of rural-urban tension and conflict is the case of the (*still largely pastoral*) Beja tribesman from their rural home to Port Sudan during the severe drought of 1984-86. Both Beja and other ethnic groups (Eritrean and Ethiopians and people from other parts of Sudan) live and work in Port Sudan, but the Beja regard the areas as their land. As trade has fallen into the hands of Arab merchants in towns, the Beja find it natural to see these merchants as the cause of their misery particularly since the major drought of 1984-86. Consequently there exists a strong feeling of discontent against the "intruders." creating the divide between the rural and urban people.

12. A.G.M. Ahmed, "Ecological Degradation in the Sahel: the Political Dimensions", in A Hjort and M.A.M. Salih eds., Ecology and Politics: Environmental Stress and Security in Africa (Uppsala: Scandinavian Institute of African Studies, 1989, pp.89-99.

ENVIRONMENTAL DEGRADATION AND ETHNIC CONFLICT

Environmental degradation is one of the factors that has contributed to the distorted growth of towns. With increased size, demands for food and fuel, work and shelter have become harder to meet. Food and fuel costs have risen and clashes of rich and poor, weak and powerful have been polarized often with political consequences.

In 1986, what was considered a pan-Beja symbol in Port Sudan led to violent ethnic riots between Beja and non-Beja. The cases of ethnic and perhaps religious discrimination contributed to uniting and organising the Beja. This enabled them to present their demands more and more forcefully. Old and new sections of the town population came into opposition. This coincided with the rich and the poor, and the Arabs and the Beja, and also between different representatives of modes of production (merchants and manual workers, etc.)

Similar situations developed elsewhere in Sudan. In the South, *Burton* writes, "one sees.. a radical transformation of indigenous societies as they are denied the resources and security once promised in their homelands, being

exploited and manipulated by for example rich merchants from the north."¹³ *Ahmed* records, "tension and aggression is a common feature of daily life in the urban setting of the countries of the Sahelian Zone",¹⁴ because intensified competition over resources has destroyed the traditional ethics of co-operation and sharing.

An example of militarization of conflict has been reported from western Sudan in DarFur by *Sharif Harir*. In DarFur, localised famines which were a result of the advanced state of deterioration of the natural resource base coupled with the sharp decline in rainfall, were reported as far back as the early 1970s. By the mid-seventies, a sizeable population movement from the northern part of the region to the central farming belt in the southern parts of the region was underway. Since this belt was the abode of farming communities, including the Fur, Birgid and Tunjur, in addition to pastoral groups, such as the Rezaiqat,

-
13. J.W. Burton, "When the North Winds Blow: A Note on Small Towns and Social Transformation in the Nilotic Sudan", *Africa Studies Review*, vol.31, 1988, no.3, pp.49-60.
 14. A.G.M. Ahmed, "Ecological Degradation in the Sahel: The Political Dimension", in *Ecology and Politics: Environmental Stress and Security in Africa* (Uppsala: Scandinavian Institute of African Studies, 1989) pp.90.

Beni Hebla and Habaniya, the heavy influx of farming and nomadic groups from the northern part of the region created competition for resources. This competition intensified not only between migrants and the original population, but also between the different units that constitute the tribal groups of the original population. The tribal conflicts arising from intense competition for resources soon developed an ominous military character where modern weapons were used in raids and counter raids.¹⁵

Similarly, the presence of the Somalis in Ethiopia has, in a sense revived some of the old disputes between the Somali clans, especially between the Gadabursi and Ogadeeni, on the one hand, and the Ogadeeni and the Isaqs, on the other.¹⁶

15. Sharif Harir, "Militarization of conflict, displacement and the legitimacy of the state: a case from Dar Fur, Western Sudan", in Terje Tvedt, Conflicts in the Horn of Africa ; human and ecological consequences of warfare (Uppsala: Department of Social and Economic Geography, 1993) p.20-21.

16. Maria Brons et al, "War and the Somali refugees in Eastern Hararghe; Ethiopia" in Ibid, p.55

Effect of War and Ethnic-Conflict on the Environment

The causes and consequences of famine and civil-conflict in Africa are of great importance. Many scholars now see a significant link between them. They directly affect upon food-availability in the region. The continuing secessionist civil-war in Southern Sudan and clan-wars in Somalia have all had damaging effects upon food-supply. As an experienced observer describes it, "War is and will continue to be the major cause of famine in Africa".¹⁷

It is also argued that famine has become an instrument of war in modern Africa. Governments have been active in denying food-aid to rebel or potentially secessionist regions in the Horn. This was a tactics of the Ethiopian government under President Mengistu Haile Mariam in the 1970s and 1980s, and has also been used elsewhere in the Horn particularly in Sudan. Demands of food-aid have also been exploited to try and co-erce rebel populations into submission. This has been the case in southern Sudan, where successive Khartoum governments have laid siege to the city of Juba - a siege which is the longest

17. A de Waal, "War and Famine in Africa", IDS Bulletin, vol.24, No.4, Oct.1993, p.40.

running in contemporary Africa.¹⁸

When warfare precipitated, the development of underground economies which is essentially based on asset stripping, also increased. Many researchers have highlighted the role of environmental factors such as drought, and the contribution of economic and social conditions to civil-conflicts but it becomes aptly clear that there exists a link between war and famine prevalent in the countries of the Horn. It is estimated that approximately 15 children were dying everyday in the refugee camps in the countries of Horn. During the period 1982-1992, 2 million people died in the Horn of Africa — primarily because of war and famine and still more famine threatens over the region.¹⁹

Role of Environment in Ethnic Conflict and War:

Environment has played a critical role in the continuing, Ethnic conflict, carrying out Guerrilla warfare and counter insurgency operations in the countries

18. Stephen P.Riley, "War and Famine in Africa", Conflict Studies, Feb.1994, p.7.

19. Stephen P.Riley, "War and Famine in Africa", Conflict Studies, February 1994, p.3.

of Horn as it has some of the typical features to promote such activities.

Mountain Terrain :

The effectiveness and strength of defensive mountain warfare is derived from two main factors : *first*, the difficulty of moving long columns over mountain roads, and *second*, the extraordinary degree of strength attained by a small post whose front is covered by a steep mountain side while its flanks are supported by deep ravines. Keeping these two points in perspective it viably has become an area of immense strength for the guerrilla movement in the countries of the Horn. The terrain offers powerful resistance through its natural obstacles. The guerrillas concentrate on forming a union of its outfit to the terrain. By doing so, they defend the mountain and the mountain defends them but in the process the vegetation and the environment faces the consequences. Mountain terrain has been very effective for guerrillas in Ethiopia in the northern part and in the Omo Valley.

Forest Terrain :

The insurgent movements in the countries of the Horn have kept forest in their defensive line of planning as they have used it as a screen for movements and as a cover to facilitate eventual retreat. Forests have also acted as a launch-board for ambush and skirmishes. As a result of counter insurgency operations larg parts of forest in Tigray province were deforested to prevent camouflage for insurgents.

Desert Terrain:

In the Horn, as most of the mountaineous region is a semi-desert area, their erosion has produced steeper and more angular hill-sides. The steep slopes with "Wadi" banks have created obstacles to cross country movement. The lack of vegetation has further affected observation and concealment. The local guerrillas have been so well habituated to the environment and the topography of the region that it has made them superior players in applying their tactical modes against the counter-operators, who are much hindered by the extremely harsh desert environment. Large part of northern coastal plains of Somalia is an example of desert terrain as they are particularly arid and favours Somali armed groups to operate freely.

Human and Ecological Consequences of Warfare in Somalia :

Displacement is one of the main consequences of the civil war in Somalia. It was estimated in October 1991 that about 2.5 million Somalis were affected by shortage of food, 2 million were displaced, and 100,000 have returned, making the total number of affected people 4.6 millions (63% of the total population of Somalia).²⁰ The food situation has been aggravated by the destruction of roads and the hundreds of thousands of mines which were planted in and around the major towns in northern Somalia.²¹ The war has virtually destroyed the whole infrastructure, including schools, the health service, water supply facilities and government buildings.²²

Many of the displaced people in southern Somalia are outside the reach of medical services and food relief is at times obstructed for weeks and months,

-
20. SEPHA, Situation Report, Special Emergency Programme for the Horn of Africa (New York: SEPHA, 1991) p.66.
 21. M. Bongartz, The Civil War in Somalia: Its Genesis and Dynamics Current African Issues No.11, (Uppsala: Scandinavian Institute of African Studies, 1991)
 22. Maria Brons et al., "War and the Somali refugees in Eastern Haraghe, Ethiopia", in Terje Tvedt ed., Conflicts in the Horn of Africa: Human and ecological consequences of warfare (Uppsala: Deptt. of Social and Economic Geography, 1993) P.55.

leading to hunger and malnutrition. The situation can be described as disastrous; the continuous fighting between rival *United Somali Congress* factions resulting in the death of about 4,000 people between October 1991 and January 1992.²³

As result, the formal economy collapsed and exports of livestock which make up Somalia's main source of foreign exchange came to a halt. The veterinary facilities were destroyed and because of unavailability of drugs and vaccines the likelihood of the spread of epidemics increased. In October 1991 the *Special Emergency Programme for the Horn of Africa*²⁴ reported that a survey in central and southern Somalia indicated that livestock numbers have been reduced by 15 per cent in the past year. Further, nearly one third of the animals in the survey showed signs of severe malnutrition. In the north, it is reported that about half of the goats and sheep have died in the past two years. In Adwal (bordering Djibouti), an estimated reduction in the livestock population of around one-third is directly attributed to civil-strife and consequential lack of

23. EIU 1991-1992, Uganda, Ethiopia, Somalia and Djibouti: "Country Profile (London: Economist Intelligence Unit).

24. SEPHA, Situation Report, Special Emergency Programme for the Horn of Africa (New York: SEPHA; 1991) p.67.

veterinary care. Table 1 shows the number of livestock owned before and after the 1988 fighting.

**Reduction in the Number of Livestock between 1988 and 1991
in Somalia due to civil-strife**

Livestock	1988	1991
Cattle	1,469	1,247
Camels	191	28
Sheep	3,508	2,475
Goats	2,500	1,972
Total Livestock Units	7,668	5,722

SOURCE After Maria Brons et al., "War and the Somali refugees in Eastern Haraghe, Ethiopia", in Terje Tvedt ed. Conflicts in the Horn of Africa: human and ecological consequences of Warfare (Uppsala: Deptt. of Social and Economic Geography, 1993) p.67.

Table 1

Human and Ecological Consequences of Warfare in Ethiopia :

According to Sivard²⁵ 609,000 Ethiopians died between 1974 and 1990, more than 500,000 of them civilians and about 2 million Ethiopians and 700,000 Eritreans became refugees in Sudan and Somalia in the 1980s.²⁶

In the course of separatist Eritrean war, the ecology suffered extreme damage. At the advent of Italian colonialism, 35,000 km², or 30% of Eritrea, was covered by forest. These forests were richly endowed with wildlife. After a century, Eritrea was left with less than 5,000 km² of forest, covering only about 4% of its surface area. Most of its wildlife perished in the fighting or, haunted by the incessant reverberations of air and ground fire, fled the country *en masse*. Large areas of forests and woodlands, were virtually decimated whose main causes as put forward by *Anderberhan W.Giorgis*²⁷ are as under:-

-
25. R.Sivard, World Military and Social Expenditures (Washington, DC: World Priorities).
 26. UNHCR, UNHCR Fact Sheet No.13, Somalia (Geneva: United Nations High Commissioner for Refugees, 1987).
 27. Anderberhan W.Giorgis, "The human and ecological consequences of the war in Eritrea", in Terje Tvedt ed., Conflict in the Horn of Africa: human and ecological consequences of warfare (Uppsala: Dept of Social and Economic Geography, 1993) pp.80-81.

- a) The requirements for the construction of shelter (housing), bunkers and trenches along and around the hundreds of kms of frontlines, as well as for firewood and charcoal, mainly by the huge Ethiopian occupation army but also, to a much lesser extent, by the Eritrean People's Liberation Army itself.
- b) The active involvement of the Ethiopian army in the highly lucrative sale of firewood and charcoal to captive consumers in the hitherto occupied cities and towns of Eritrea such as Asmara, Keren, Dekemhare and Mende fera.
- c) The Ethiopian army's practice of clearing "dangerous" areas of their tree and wood cover so as to create a reliable "security-belt" around its various garrisons and fortifications. Such victims include Biet Giorgis on the eastern outskirts of Asmara, Kebre Bizen on the Asmara-Massawa road, Halhal north of Keren and the forests of Sahel in the north and Semienawi Bahri along the Eastern Escarpment.
- d) The prolonged internal displacement of hundreds of thousands of people, which necessitated the construction of new shelters to accommodate them

in the liberated and base areas. The concomitant clearing for new farmlands and the additional needs for firewood and charcoal aggravated the process of denudation.

- e) The pastoralists practice of cutting trees at their stems in an effort to provide fodder to their dying livestock, imposed by their inability to tackle the impact of drought under the then prevailing conditions of war.

In the course of the long war, the back of the Eritrean countryside has also been criss-crossed by a network of trenches, fortifications, heavy military pathways, tank-traps and mine fields. In addition, much of the shrub and vegetation have been the direct casualties of heavy military traffic, as well as saturated ground and aerial bombardment. The resulting loss of vegetation cover has also exposed these zones to accelerated soil erosion, via running water or wind.

In addition to damage to topsoil, large numbers of livestock were decimated through a combination of mass requisition and killing by the Ethiopian army and airforce. Land mines have also claimed a heavy toll on livestock. In

the fifteen years extending from 1977 to 1992, Eritrea's livestock wealth was reduced by 50% to 70%.²⁸ The following table shows the relative decline for the different categories of livestock:

Relative Decline of Livestock during 1977-1992 in Ethiopia

Category	Year		Percentage Reduction
	1977	1992	
Cattle	3.4m	1m	70%
Sheep & Goats	13.9m	5m	62%
Oxen	554,000	273,000	51%
Camels	554,500	185,000	66%
Pack Animals	479,000	268,000	44%

SOURCE: PGE Department of Agriculture (Unpublished). After Anderberhan W.Giorgis, "The human and ecological consequences of the War in Eritrea", in Terje Tvedt ed., Conflict in the Horn of Africa: human and ecological consequences of warfare (Uppsala: Deptt. of Social and Economic Geography, 1993) p.81.

Table 2

28. Ibid., p.82.

In Tigray province of Ethiopia, war's impact was the direct out-migration of some 200,000 people to Sudan beginning in late 1984. The counter-insurgency campaign resulted in the direct destruction of civilian lives and livelihoods. Aggregate losses for the attack during the counter insurgency operations between 1980-1985 includes thousands of tons of grainstocks and crop standing in fields, several thousand heads of cattle and as many as ten thousand goats and sheeps as well as some 10,000 buildings.²⁹

In addition to above, tens of thousands of civilians were displaced from their homes as a result of ground offensives. These population displacements greatly exacerbated the problems posed by internal migrations that were already occurring in response to drought conditions during these years.

The links between environmental degradation and warfare in Tigray fall into two broad categories: environmental destruction through military means or related activity, and damage caused by human and animal populations as a consequence of economic stress, brought about warfare combined with other factors.

29. B. Hendrie, Report on a Visit to Tigray: February 1985 (Khartoum: Interfam Information Project, 1985) p.18.

Various factors as a consequence of direct destruction of war in Tigray province of Ethiopia can be listed as³⁰:-

- The indiscriminate movement of heavy machinery such as tanks and artillery pieces through areas with already weakened top soil and sparsely vegetated grazing areas.
- The damage caused by cutting down trees around army encampments, or over to large areas to deny insurgents camouflage.
- The cutting of trees and shrubs by the civilian population as well as TPLF forced to cover houses, grain stores and military installations, in order to avoid attracting fighter aircraft. This also includes the cutting of shrubs to cover food aid provided in shiny white polypropylene bags that were easily detectable from the air.
- The burning of ecologically sensitive rangelands by incendiary devices, probably including napalm, which inhibits the growth of vegetation.

30. Barbara Hendrie, "The impact of war in Tigray province, Ethiopia", in Terje Tvedt, "Conflicts in the Horn of Africa: human and ecological consequences of warfare" (Uppsala: Deptt. of Social and Economic Geography, 1993) p.96-97.

In addition to these factors, war-related population displacements also had the effect of interrupting land management activities such as weeding, crop rotation and additional turning of topsoil.

Human and Ecological Consequences of Warfare in Sudan:

The most important aspect of the civil-war in the Sudan is its multidimensional nature, and the fact that its continuity is a result of both internal and external factors.³¹ Further, the conflict is no longer confined to one region or one category of the population. It cuts across ethnic and social interest groups, as well as across regions.

The increasing pressure on land, leading to environmental degradation and loss of the resource base for a large proportion of the people, has led to a high mobility and displacement. A high percentage of the Southern Region has either become refugees in neighbouring countries, or moved to central Sudan to seek means of survival in the shanty areas around large towns such as Khartoum. The conditions under which such people live are extremely poor. They lack all basic necessities for survival. Further, such conditions subjects the displaced and

31. M. Mohamed Salih et al, The Impact of War on the Sudan Report Submitted to UNICEF (Nairobi: UNICEF, Sept. 1990).

their host towns to environmental hazards.³²

Some of the practices and survival strategies of the refugees, such as wood-collecting and charcoal-making for the urban market, have led to deforestation. Pastoralists, however are contributing to this process by cutting branches off trees to feed their small ruminants.

Our study of environmental conflicts (*conflicts that arise when the environment fails to supply people with what they expect from it*) in the countries of the Horn have shown that there has been conflicts between various groups of pastoralists; between pastoralists and agriculturalists; among agriculturalists; between rural and urban people and all these have led to violent ethnic conflicts in the region. Conflicts have mainly occurred because the environment has been seriously degraded and various groups have competed for ownership of land that produces the food. There has also been opposition to modern innovations, where the claim has been traditional land-use rights and severe opposition to influx of people from migrating zones to town areas or areas where chances of better survival are bright.

32. Abdel Ghaffer M. Ahmed, "The human and ecological impact of the civil war in the Sudan", in Terje Tvedt, Conflicts in the Horn of Africa: human and ecological consequences of warfare (Uppsala: Deptt. of Social and Economic Geography, 1993) p.117.

Degradation of environment has been brought about also by various low intensity conflicts and wars which inflict the countries of the Horn.

Our analysis has reflected that the natural environment too have provided conditions for guerrilla operations, either as partisans in the hills and mountain or as units in the jungle or desert. To carry their goal they have generally involved various methods of warfare which has affected the ecology of the region. it has become more adverse when counter measure operations have been taken in order to overpower the guerrillas in their natural habitat. Such measures have often involved defoliant weapons or other chemical weapons. Measures like clearing forests to flush out the activists has left out a big scar on the ecosystem of the region. In fact in order to maintain the initiative in the fighting; counter forces have employed a "search and destroy means", having acute consequences on the environment as the topography and the general eco-system is so inextricably linked to the means and modes of operation.

CONCLUSION

**EMERGING LINKAGES BETWEEN ENVIRONMENTAL
DEGRADATION & SOCIO-POLITICAL STABILITY IN
THE HORN OF AFRICA**

In the countries of the Horn, the links between environmental degradation and the strains on natural and social systems have created regional impacts. The states and nations have been destabilized by environmental collapse-leading to famine, migration and rebellion. The carrying capacity of the land is reduced and life conditions for human beings, animals and vegetation have been eroded with the soil. Number of "*environmental-refugees*", or people who are fleeing the land which can no longer support them have grown over the years and they have joined the "*traditional*" refugees fleeing war and depression.

Environmental refugees have exerted pressure not only on the carrying capacities of the land but also on the politics involved (particularly in Ethiopia, Somalia and Djibouti). They have come under pressure from shanty towns and squatters encircling the cities, particularly the medium-sized cities and today it seems that they threaten to strangle them. Food-riots and urban violence have been a contributing factor in triggering the Political and Social - instability. The incapacity of the Political institutions to cope with the problems is likely to stimulate propensities for easy solutions through repressive practices.

Environmental degradation has exacerbated conflicts among competing groups of pastoralists and between *pastoralists and settled farmers* (as discussed in *Chapter III*). Such conflicts are to some extent traditional in the countries of the Horn but under the impact of recent droughts they have multiplied and intensified. Herds are exceeding the carrying capacities of the vegetation leading to a deterioration of the soil and thereby to a further lowering of the capacity in a downward spiral.

Civil-wars which afflict the countries of Horn (*mostly in Somalia and Sudan*) and environmental degradation have mutually reinforcing effects — combining to undermine the basis for development. In most of the war-zones, hospitals, clinics, schools and all other social services were curtailed or closed. (as discussed in *Chapter II under Section Effect of War and Ethnic conflict on the Environment*). Similarly, commercial activities, trade and communications were disrupted [*in Tigray in Ethiopia; in Eritrea (now independent); in Somalia and in southern Sudan*]. Consequently the traditional food security system broke down because war rendered production difficult, and farming was constrained by the inaccessibility of seeds, agricultural tools, fertilizers and other inputs. Rich

agricultural areas are devastated and the food crop cycle is at least temporarily disrupted. Many armies also loot and pillage (*as evidenced in Somalia between various clan warring groups and in SPLA controlled areas of southern Sudan*). Unpleasant by-products of war include the spread of disease, the forced conscription of farmers and children, and the landmines.

The link between war and famine is aptly demonstrated in the countries of the Horn where famines have become an instrument of war. Governments have generally denied food-aid to rebel or potentially secessionist regions [*as in Eritrean (earlier part of Ethiopia) and Tigray province of Ethiopia and SPLA and SPLM dominated areas in southern Sudan and conflict ridden areas in Somalia*]. They have also sought to use a variety of counter-insurgency tactics, such as forced population movements to protected villages (*especially in Ethiopia*). Intense warfare have turned near famine conditions into mass-starvation (*as evidenced in Ethiopia, Somalia and Southern Sudan*). There were two culprits. In one condition, the national government which sought to avoid being toppled and acted to defend themselves, as was in Ethiopia during Haile Selassie's regime, and the other in which rebel or secessionist groups destroyed

the infrastructure as in Somalia. In these circumstances the linkage between conflict and famine become distinct where there is much more damage done : the destruction of the environment, increase in the number of refugees, both internally displaced and in exile, the opportunity cost of government expenditure upon the weaponry of war, the numbers of war related or famine-related deaths due to disease, and the immensely destructive effects of war upon the infrastructure of society, such as roads, hospitals and schools.

The Causal Role of Environmental Degradation:

In the Horn of Africa, environmental degradation often acted as a powerful long term social stressor but did it have any independent role as a cause of conflict leading to socio-political instability? Many analysts assumed that it was no more than a fully endogenous variable linking political, economic, and social factors to conflict. Interpreting this, environmental degradation may be an important indicator that political and economic development have gone wrong, but doesn't merit, in and itself, intensive research and policy attention at the expense of more fundamental political and economic factors.

But in our study of the countries in the Horn we have come across enough evidences which proves the above view wrong. *First*, as we saw how conflicts have led to nation-wide turmoil and changes of government in Sudan (*overthrow of Numeirie's regime*); Ethiopia (*fall of Haile Selassie's government in September 1974*) and in Somalia (*fall of Siyad Barre's regime in January 1991*) and they have intricate relationship to environmental degradation and its subsequent effect. *Secondly*, in the countries of Horn - environmental degradation have crossed a threshold of irreversibility thereby becoming an exogenous variable having a chain of consequences. Most important of them is the large scale transmigration of pastoralists to marginal lands (*as discussed in chapter II under Section Breakdown of Rural Life: Population Movement and Disrupted Institutions*) and putting a severe strain on economy (*especially small country like Djibouti which has suffered from the flow of refugees from the Eritrean and Ogaden conflicts in Ethiopia*) and acting as a source of conflict with native population. *Thirdly*, environmental degradation has insidious and cumulative social impacts, such as population movement, economic-decline and the weakening of states in all the countries of the Horn under study. They have not

only contributed to diffused and persistent national violence (*e.g. civil-strife in Somalia and southern Sudan*) but their rate and extent might increase as scarcities worsen in future.

Thus, environmental degradation has acted as a contributing factor to social and political instability as evidenced from the countries of the Horn of Africa. They are the source of large-out-migrations and have inflicted a severe strain on state systems progressively decreasing the capacity to adapt to environmental stress.

In the Horn of Africa, the environment has deteriorated so badly that much of the land may be forever lost as productive soil unless the trend can be reversed in next few years. The gravity of the situation has now been realized by government in the Horn (*an example is the formation of Inter-governmental Authority on Drought and Development with its headquarters in Djibouti*), and ordinary people are becoming increasingly concerned with what is happening in their natural surroundings. They see their work on the land producing less and less, and many have to look for means of survival away from home. Droughts are occurring in shorter and shorter cycles and may become permanent in areas

that are gradually turning into desert. Forests are disappearing at a faster rate and more and more people are migrating to areas of better survival.

Among the countries of the Horn co-operation is lacking in the area of environmental issues - both resources and hazards - and today it seems one of the more promising areas of common efforts that could yield a harvest of peace, prosperity, reduced tension and greater social and human well-being. For this vast amounts of planning, information gathering and financial inputs will be needed if success is to be achieved in upgrading the environment and bringing people in the Horn of Africa closer together.

BIBLIOGRAPHY

BIBLIOGRAPHY

PRIMARY - SOURCES

Central Statistics Office, Ethiopia, 1963-1984 (Addis Ababa: CSO, 1984).

DANIDA, Sudan Environment Profile. (Denmark : Ministry of Foreign Affairs, 1989).

EIU 1991-1992, Uganda, Ethiopia, Somalia and Djibouti: Country Profile. (London: Economic Intelligence Unit).

Environment Almanac : The 1992 Information Please. (Boston : Houghton Mifflin Co., 1992).

FAO Production year-book, various years. (Rome).

Lecture delivered by Mrs. Gro H. Bruntland for SIPRI on 18th Nov, 1992, Environment and, Security and Development.

Mngrabi, A., Hydrobiology Unit, University of Khartoum. (Unpublished paper).

OEOA : Status Report on the Emergency Situation in Africa as of 1st April, 1986. (New York : United Nations Organisation, 1986).

PGE Department of Agriculture. (Unpublished)

SEPHA, Situation Report, Special Emergency Programme for the Horn of Africa. (New York : SEPHA, 1991).

United Nations Environment Programme, UNEP Profile. (Nairobi, 1990).

United Nations Environment Programme, UNEP : Two Decades of Achievement and Challenges. (Nairobi, 1992).

UNHCR, UNHCR Fact Sheet No. 13, Somalia (Geneva : United Nations High Commission for Refugees, 1987).

United Nations Population Fund, Population and the Environment ; The Challenges Ahead (New York, 1991).

World Bank; Accelerated Development in Sub-Saharan Africa ; A Joint Programme of Action (Washington, DC : The World Bank, 1981).

World Bank, Ensuring Food Security in the Developing World (Washington, DC: The World Bank, 1985).

World Bank, Hunger and Poverty (Washington, DC: The World Bank, 1986).

World Bank, World Development Report 1992 : Development and the Environment (Oxford: Oxford University Press, 1992).

World Commission on Environment and Development; Our Common Future (New Delhi : Oxford University Press, 1987).

World Resource Institute, A Guide to the Global Environment (Oxford : Oxford University Press, 1990).

World Resource Institute, World Resource 1994-1995 (New Delhi : Oxford University Press, 1994).

SECONDARY SOURCES

Books

Adams, W.M., Green Development : Environment and Sustainability in the Third World (London : Routledge & Kegan Paul, 1990).

- Adedeji, Adebaya and Shaw, Timothy M., eds., Economic Crisis in Africa : African Perspectives on Development Problems and Potentials (Boulder, Colorado : Lynne Rienner Publishers, 1985).
- Agarwal A. And S. Narain, Global Warming in a Unequal World : A Case of Environmental Colonialism (New Delhi : Centre for Science and Environment, 1991).
- Amnesty International, Somalia : A Human Rights Disaster (London : Amnesty International, 1992).
- Angell, D.J.R., Comer, J.D. and Wilkinson, M.L.N., eds., Sustaining Earth : Response to the Environmental Threat (London : Macmillan, 1990).
- Assefa, H. and Khadiagala, G., eds., Conflict and Conflict Resolution in the Horn of Africa (Washington, D.C.: Brookings Institution, 1994).
- Benett, Olivia, ed., Greenwar : Environment and Conflict (London : The Panos Institute, 1991).
- Beshir, M.O., ed., The Nile Valley Countries : Continuity and Change (Khartoum : University of Khartoum, Institute of African and Asian Studies, Sudanese Library Series No.12, 1984).
- Bezzabeh. M., Revolution and Land Reform : A Study of the Impacts of Agrarian Changes in Wollo Region (Rome : FAO, ESH, 1980).
- Blaikie, P., The Political Economy of Soil Erosion in Developing Countries(London : Longman, 1985).
- Blaikie, P. and Brookfield, H., eds., Land Degradation and Society (London : Methuen, 1987).

- Bongartz, M., The Civil War in Somalia : Its Genesis and Dynamics, Current African Issues No.11 (Uppsala : Scandinavian Institute of African Studies, 1991).
- Brown, Lester R., Building a Sustainable Society (New York : W.W. Norton and Company, 1981).
- Brown, Lester R., ed., The Worldwatch Reader : On Global Environmental Issues (New York : W.W. Norton and Company, 1991).
- Chisholm, Michael and Smith, David M., eds., Shared Space, Divided Space : Essay on Conflict and Territorial Organization (London : Unwin Hyman, 1991).
- Chole, Eshetu, ed., Food Crisis in Africa : Policy and Management Issues, (New Delhi : Vikas Publishing House Pvt. Ltd., 1990).
- Colburn, F.D., ed., Everyday Forms of Peasant Resistance (London : M.E. Sharpe, 1989).
- Commins, Stephan K. et al., eds., Africa's Agrarian Crisis: The Roots of Famine (Boulder; Colorado : Lynne Rienner Publishers, 1986).
- Conze, P. & Labahn, T. eds., Somalia : Agriculture in the Winds of Change (epiverlag: Saarbrucken schafruche, 1986).
- Coser, Lewis., Continuities in the Study of Social Conflict. (New York : Free Press, 1976).
- Dahl, G., and Hjort af Ornas, A., Having Herds (Stockholm : University of Stockholm, 1976).
- Davis, Kingsley and Bernstam, Mikhail S., eds., Resources, Environment, and Population : Present Knowledge, Future Options (New York : Oxford University Press, 1991).

- de Waal, A., Famine That Kills (Oxford : Clarendon Press, 1989)
- de Waal, A., War in Sudan - An Analysis of Conflict (London : Peace in Sudan Group, 1990).
- Desta, T., Disaster Management in Ethiopia : Past efforts and future directions (Addis Ababa : United Nations Sudano - Sahelian Office : Workshop on Drought Preparedness and Mitigation, May 1993).
- Dinham, B. & Hines, C., Agribusiness in Africa (London : Earth Resource Research, 1983).
- Dreze, J. and Sen, A., Hunger : Economics and Policy (Helsinki : UN University; World Institute for Development Economics Research, 1986).
- Dryzek, J.S., Rational Ecology : Environment and Political Economy (Oxford : Basil Blackwell, 1989).
- Doornbos, Martin et.al., eds., Beyond Conflict in the Horn : The Prospects for Peace, Recovery & Development in Ethiopia, Somalia, Eritrea & Sudan (London : James Currey, 1992).
- Echolm, Erick P., Losing Ground : Environmental Stress and World Food Prospects (New York : W.W. Norton, 1976).
- El-Hinnawi, E., Environmental Refugees (Nairobi : UNEP, 1985).
- Farer, T.J., War Clouds in the Horn of Africa (Washington, D.C.: Carnegie Endowment for International Peace, 1979).
- Fowler, Cary and Mooney Pat., Shattering : Food Politics and the Loss of Genetic Diversity (Tucson; University of Arizona Press, 1990).

- Giorgis, Dawit Wolde, Red Tears : War, Famine and Revolution in Ethiopia (Africa World Books, 1989).
- Glantz, Michael H., eds., Drought and Hunger in Africa : Denying Famine a Future (Cambridge : Cambridge Univeristy Press, 1987).
- Glantz, Michael H., ed., Desertification : Environmental Degradation in and Around Arid Lands (Boulde; Colorado: Westview Press, 1977).
- Goldsmith, E. and Hilyard N., The Social and Environmental Effects of Large Dams (U.K.: Waterbridge Ecological Centre, 1984).
- Grainger, A., The Threatening Desert : Controlling Desertification (London : Earthscan Publications, 1990).
- Gurr, Tedd Robert, Why Men Rebel? (New Jersey : Princeton Univeristy Press, 1970).
- Hamilton, A.C., Environmental History of East Africa (New - York : Academic Press, 1982).
- Hancock, Graham, Ethiopia : The Challenges of Hunger (London : Gollancz, 1985).
- Hansen, Art and McMillan, Della E., eds., Food in Sub-Saharan Africa(Boulder, Colorado : Lynne Rienner Publishers, 1986).
- Heltne, B., Development Theory and the Three Worlds (London : Longman, 1990).
- Hjort of Ornas, A., and M.A.M. Salih, eds., Ecology and Politics : Environmental Stress and Security in Africa (Uppsala : Uppsala University, 1989).

- Independent Commission on International Humanitarian Issues, Famine : A Man-Made Disaster? (London : Pan Books, 1985).
- Jacobson, D. and Anderson D., eds., Refugees : A Yardstick of Habitability (Washington; D.C.: Worldwatch Institute, 1989).
- Jansson, Kurt, Michael Harris and Angela Penrose, The Ethiopian Famine (London & New Jersey : Zed Books Ltd., 1987).
- Johnson, D. and Anderson D., eds., The Ecology of Survival : Case Studies from Northeast African History (London: 1988).
- Johnston, R.J., Environmental Problems : Nature, Economy and State (London: Belhaven Press, 1989).
- Laitin, David D. and Said S. Samatar, Somalia : Nation in Search of a State (Boulder; Colorado: Westview Press, 1987).
- Lawrence, Peter, ed., World Recession and the Food Crisis in Africa (London: Review of African Political Economy, James Currey, 1985).
- Lewis, L.A. and Berry, L., African Environment and Resources (London: Unwin Hyman Ltd., 1988).
- Mandel, Robert, Conflict over the World Resources (Connecticut: Greenwood Press, 1988).
- Mariam, Mesfin Wolde, Rural Vulnerability to Famine in Ethiopia : 1958-1977 (New Delhi: Vikas Publishing House in association with Addis Ababa University, 1984).
- Markakis, J., National and Class Conflict in the Horn of Africa (London : Zed Books, 1990).
- Myers, Norman, Not Far Afield : U.S. Interests and the Global Environment (Washington, D.C.: 1987).

- Myrdal, Gunnar, Asian Drama : An Inquiry into the Poverty of Nations, 3 vols. (New-York: Pantheon, 1968).
- Neher, Philip A., Natural Resources : Economics, Conservation and Exploitation (Cambridge: Cambridge Universtiy Press, 1990).
- Raikes, Philip, Modernising Hunger : Famine, Food Surplus & Farm Policy in EEC & Africa (London: James Currey, 1990).
- Redclift, M., Development and the Environmental Criiss : Red or Green Alternatives? (London: Methuen, 1984).
- Redclift, M., Sustainable Development : Exploring the Contradictions (London: Methuen, 1987).
- Ruiz, H., Beyond the Headlines : Refugees in the Horn (Washington, D.C.: U.S. Committee for Refugees, 1988).
- Samatar, Abdi I., The State and Rural Transformation in Northern Somalia, 1884-1986 (Madison: Wisconsin University Press, 1989).
- Samatar, Ahmed I., ed., The Somali Challenge : From Catastrophe to Renewal? (Boulder & London : Lynne Rienner Publishers, Inc., 1994).
- Scott, J.C., Weapons of the Weak : Everyday Forms of Peasant Resistance (London: Yale University Press, 1985).
- Shepherd, J., The Politics of Starvation (Washington, D.C.: Carnegie Endowment for International Peace, 1975).
- Sivard, R., World Military and Social Expenditures (Washington, D.C.: World Priorities, 1984).
- Suliman, M., Greenhouse Effect and its Impact on Africa (London: Institute for African Alternatives, 1990).

- Timberlake, Lloyd, L., Africa in Crisis : The Causes, the Cures of Environmental Bankruptcy (London : Earthscan 2nd ed., 1988).
- Tolba, M.K., Sustainable Development : Constraints and Opportunities (London: Butterworths, 1987).
- Tolba, Mostafa Kamal, Environment and Development : Lessons of the Past, Challenges for the Future (Nairobi, Kenya : Information and Public Affairs, UNEP, 1991).
- Tvedt, Terje, Conflicts in the Horn of Africa : Human and Ecological Consequences of Warfare (Uppsala; Department of Social and Economic Geography, 1993).
- Vayrynen, Raimo, ed., New Directions in Conflict Theory (London : Sage Publications, 1991).
- Warnack, John W., The Politics of Hunger : The Global Food System (Toronto : Methuen, 1987).
- Westing, A.H., ed., Environmental Hazards of War : Releasing Dangerous Forces in an Industrialized World (London : Taylor and Francis, 1990).
- Westing, A.H., ed., Explosive Remnants of War : Mitigating the Environmental Effects (London : Taylor and Francis, 141 pp. , 1985).
- Westing, A.H., ed., Environmental Warfare : A Technical, Legal and Policy Appraisal (London : Taylor and Francis, 141 pp., 1984).
- Westing, A.H., ed., Cultural Norms, War and the Environment (New York : Oxford University Press, 177 pp., 1988).

- Westing, A.H., ed., Global Resources and International Conflict : Environmental Factors in Strategic Policy and Action (Oxford: Oxford University Press, 280 pp., 1986).
- Westing, A.H., ed., Herbicides in War : The Long Term Ecological and Human Consequences (London : Taylor and Francis, 210 pp., 1984).
- Westing, A.H., ed., Warfare in a Fragile World : Military Impact on the Human Environment (London : Taylor and Francis, 1980).
- Wijkman, A. and Timberlake, L., Natural Disasters : Acts of God or Acts of Man? (London : Earthscan, 1984).
- Zolberg, Aristide R. et al., Escape from Violence : Conflict and the Refugee Crisis in the Developing World (Oxford: Oxford University Press, 1989).

**ARTICLES, REPORT, DOCUMENTS, MONOGRAPHS, WORKING-PAPERS,
WORLDATCH PAPERS, NEWSLETTER ETC.**

- Abate Yohannis, "Ethiopia and Political Instability in the Horn of Africa", Canadian Journal of African Studies, Vol.17, No.3, 1983, pp.527-533.
- Adam, H., "Somalia : Militarism, Warlordism or Democracy?" Review of African Political Economy, No.54, July 1992, pp.11-26.
- Adam, M. Hussain, "Somalia : Rural Production Organizations and Prospects for Reconstruction", in Doornbos, Martin et al., eds., Beyond Conflict in the Horn : The Prospects for Peace, Recovery and Development in Ethiopia, Somalia, Eritrea & Sudan (London: James Currey, 1992), pp.154-165.

- Ahmed, A.G.M., "Ecological Degradation in the Sahel : The Political Dimension", in A. Hjort and M.A.M. Salih, eds., Ecology and Politics : Environmental Stress and Security in Africa (Uppsala: Scandinavian Institute of African Studies, 1989), pp.89-99.
- Ahmed, A.G.M., "National Ambivalence and External Hegemony : The negligence of Pastoral Nomads in the Sudan", in Salih, Mohammed M.A. ed., Agrarian Change in the Central Rainlands : A Socio-Economic Analysis (Uppsala: Scandinavian Institute of African Studies, 1987), pp.129-148.
- Ahmed, M. Abdel Ghaffer, "The human and ecological impact of the civil-war in the Sudan", in Tvedt, Terje, Conflicts in the Horn of Africa : human and ecological consequences of warfare (Uppsala: Department of Social and Economic Geography; 1993), pp.114-124.
- Akililu, Lemma and Malaska Pentti, "Africa Beyond Famine", A Report to the Club of Rome, 1989.
- Ali, T.M., "The Road to Jouda", Review of African Political Economy, No.26, 1983, pp.4-14.
- Amin, Samir, "Environment and Economic Calculations", Mainstream (New Delhi), Feb.12, Vol. XXXII, No.13, 1994.
- Ayoob, Mohammed, "Monograph on Horn of Africa", Occasional Canberra Papers, No.18, Canberra, Australia, 1978.
- Bassett, T.J., "The Political Ecology of Peasant-Herder Conflicts in the Northern Ivory Coast", Association of American Geographers, Vol.78, 1988, pp.453-472.

- Beinart, W., "Soil Erosion, Conservationism, and Ideas About Development", Journal of Southern African Studies, Vol.11, No.1, 1984, pp.52-83.
- Beinart, W., "Introduction : The Politics of Colonial Conservation", Journal of Southern African Studies Vol.15, 1984, pp.143-162.
- Berry, S., "Food Crisis and Agrarian Change in Africa : A review essay", African Studies Review 27(2), 1983, pp.58-112.
- Berry, S., "Social Institutions and Access to Resources in Africa", Africa, Vol.59, 1989, pp.41-55.
- Berry, S., "Access, Control and Use of Resources in African Agriculture : An introduction", Africa, Vol.59, 1989, pp.1-5.
- Bezzabeh, M., "Attempts in the Transformation of Ethiopia's Agriculture : Problems and Prospects", in Doornbos et al., eds., Beyond Conflict in the Horn : The prospects for Peace, Recovery & Development in Ethiopia, Somalia, Eritrea and Sudan (London : James Currey, 1992), pp.143-153.
- Blaikie, P., "Environmental Crisis in Developing Countries : How much, for whom and by whom? An Introduction and Overview", pp.1-6 in Blaikie, P. & T. Unwin, eds., Environmental Crisis in Developing Countries (London : Institute of British Geographers, Developing Areas Research Group, Monograph No.5).
- Blaikie, P., "Environment and Access to Resources in Africa", Africa, Vol.59, 1989, pp.18-40.
- Bliss-Guest, P., "Environmental Stress in the East African Region", Ambio, Vol.12, No.6, 1983, pp.290-295.
- Brien O.J., "The Formation of the Agricultural Labour Force in Sudan", Review of African Political Economy, No.26, 1983, pp.15-34.

- Brien O.J., "Sowing the Seeds of Famine : The Political Economy of Food Deficits in Sudan", Review of African Political Economy, Vol.33, 1985, pp.23-32.
- Brock, Lothar, "Peace Through Parks : The Environment on the Peace Research Agenda", Journal of Peace Research, Vol.28, No.4, 1991.
- Brons, Maria et al., "War and the Somali Refugees in Eastern Hararghe, Ethiopia", in Tvedt, Terje, ed., Conflicts in the Horn of Africa : Human and Ecological Consequences of Warfare (Uppsala : Department of Social and Economic Geography, 1993), pp.46-67.
- Brown, J.W., "U.S. Policy in the Crucial Decade Ahead", in Brown, J.W., ed., In the U.S. Interest : Resources, Growth and Security in the Developing World (London : Westview Press, 1990), pp.165-201.
- Brown, Neville, "Climate, Ecology and International Security", Survival, Vol.31, No.6, November/December 1989.
- Brown, Lester R. and Wolf, Edward C., "Reversing Africa's Decline", Worldwatch Paper 65, June 1985.
- Bryant, Raymond L., "Political Ecology : An Emerging Research Agenda in Third World Studies", Political Geography, Vol.11, No.1, January 1992, pp.12-36.
- Budiardjo, C., "The Politics of Transmigration", Ecologist, No.1,16, 1986, pp.111-116.
- Burton, J.W., "When the North Winds Blow : A Note on Small Towns and Social Transformation in the Nilotic Sudan", African Studies Review, Vol.31, No.3, 1988, pp.49-60.
- Bush, R., "Drought and Famines", Review of African Political Economy No.33, 1985, pp.59-63.

- Byers, Bruce, "Eco-regions, State Sovereignty and Conflict", Bulletin of Peace Proposals, Vol.22, No.1, 1991, pp.65-76.
- Camp, Sharon L., "Population : The Critical Decade", Foreign Policy, No.90, Spring 1993.
- Christopher, Sofis, "Shared Benefits, Shared Problems", PRIO Report No.3, May 1992.
- Clapham, Christopher, "The Political Economy of Conflict in the Horn of Africa", Survival, Vol.32, No.5, September/October 1990, pp.403-420.
- Colchester, M., "Banking on Disaster : International Support for Transmigration", Ecologist, Vol.16, 1986, pp.61-70.
- Coolley, J.K., "The War Over Water", Foreign Policy, No. 75, Spring 1989, pp.3-26.
- Dahl, G., "Who can be Blamed? Interpreting the Beja Drought", Paper presented to the International Conference on Environmental Stress and Security convened by the Royal Swedish Academy of Sciences, 13-15 Dec., 1988.
- Dalby, Simon, "Security, Modernity, Ecology : The Dilemmas of Post cold war Security Discourse", Alternatives, Vol.17, No.1, Winter 1992.
- "Degradation and Conservation of the Resources in the Ethiopian Highlands", Mountain Research & Development, Vol.8, No.2-3, 1988.
- de Waal, A., "War and Famine in Africa", IDS Bulletin, Vol.24, No.4, October 1993.

- Dixon Homer, Thomas F., "Environmental Change and Violent Conflict", Occasional Paper Series of the American Academy of Arts and Sciences, No.4, June 1990.
- Dixon-Homer, Thomas F., "On the Threshold ; Environmental Changes as Causes of Acute Conflict", International Security, Vol.16, No.2, Fall 1991, pp.76-116.
- Dixon-Homer, Thomas F., Jeffrey H. Boutwell and George W.Rathjens, "Environmental Change and Violent Conflict", Scientific American, February 1993, pp.38-45.
- Dixon-Homer, Thomas F., "Environmental Scarcities and Violent Conflict : Evidence from Cases", International Security, Vol.19, No.1, Summer 1994, pp.5-40.
- Dunn, Robert M., Jr., "African vs. Food", Editorial : New-York Times 12th July, 1984.
- Eccles, D.H., "Causes of African Famine", Nature, No.319, pp.715.
- Eicher, Carl K., "Facing up to Africa's Food Crisis", Foreign Affairs, 61(1), 1983, pp.151-174.
- Ejigiri, D., "Deteriorating Trends in Developing African Countries", Scandinavian Journal of Development Alternatives, Vol.9, March 1990, No.1, pp.115-139.
- Endale, Deresh, "The Ethiopian Famines, Entitlements and Governance", Working Papers No.102, UNU World Institute for Development Economics Research, Helsinki, Feb.1993.
- "Ethiopia - 15 Years On", Review of African Political Economy, No.44, 1989, pp.1-78.
- Falkenmark, Malin, "Global Water Issues Confronting Humanity", Journal of Peace Research, Vol.27, No.2, 1990.

- Faroque, Mohiuddin, "Environmental Intervention and Security". Strategic Studies Journal, Vol.5, No.1/2, 1992.
- Gameledin, Maknun, "Pastoralism : Existing Limitations Possibilities for the future", in Doornbos, Martin et al eds., "Beyond Conflict in the Horn : The Prospect for Peace Recovery and Development in Ethiopia, Somalia, Eritrea and Sudan" (London : James Currey, 1992), pp.178-184.
- Ghai, Dharam and De Alcantara, "Crisis of the 1980s in Sub-Saharan Africa, Latin America and the Carribbean : Economic Impact, Social Change and Political Implications", Development and Change, Vol.21, No.3, July 1990, pp.389-426.
- Giorgis, W. Anderberhan, "The human and ecological consequences of the war in Eritrea", in Tvedt, Terje, ed., "Conflicts in the Horn of Africa : human and ecological consequences of warfare" (Uppsala: Department of Social and Economic Geography, 1993) pp.77-84.
- Glantz, Michael H., "Drought in Africa", Scientific American, No.256, June 1987.
- Glantz, M. and Kate, R., "Drought as a Constraint to Development in Sub-Saharan Africa", Ambio, Vol.14, No.6.
- Gunnell, Barbara, "Drought in Africa", Africa Riveiw (Essex, England). World of Information, 10th ed., 1986.
- Gupta, Vijay, "Ethiopian drought and famine and the efforts of the revolutionary government to overcome their effects", Party-Life, Vol.22, No.2, Feb.86, pp.34-42.
- Gurr, Tedd Robert, "On the Political Cnsequences of Security and Economic Decline", International Studies Quarterly, Vol.29, NO.1, March 1985.

- Guyer, J.I. and Peters, P.E., eds., "Conceptualizing the Household : Issues of Theory and Policy in Africa", Development and Change, Vol.18, No.2, 1987, Special Issue.
- Hadley, Cantril, "Sentio, Ergo Sum : 'Motivation' Reconsidered", Journal of Pschyology, Vol. LXV, January 1967.
- Hah, Chong-do and Jeffrey Martin, "Towards a Synthesis of Conflict and Integration Theories of Nationalism", World Politics, Vol.27, No.3, April 1975.
- Hare, F. Kenneth, "Climate, Drought and Desertification", Nature and Resources, Vol.20, No.1, Jan-March, 1984.
- Harir, Sharif, "Militarization of Conflict, displacement and the legitimacy of the State: a case from DarFur, Western Sudan", in Tvedt, Terje, Conflicts in the Horn of Africa : human and ecological Consequences of Warfare (Uppsala: Department of Social and Economic Geography, 1993), pp.14-26.
- Harrison, Paul, " A Green Revolution for Africa", New Scientist, 7th May, 1987.
- Hassan, Shaukat, "Environmental Issues and Security in South Asia", Adelphi Papers, No.262, Autumn 1991.
- Heltne, Bjorn, "Conflicts Concerning the Control of Scarce-Natural Resources", Contemporary South Asia, Vol.1, No.2, 1993.
- Hendrie, B., Report on a Visit to Tigray Feb., 1985 for Interfam Information Project, Khartoum, 1985.
- Hendrie, B., "The impact of War in Tigray Provice, Ethiopia", in Tvedt, Terje, Conflict in the Horn of Africa : human and ecological consequences of Warfare (Uppsala: Deptt. of Social and Economic Geography, 1993) pp.85-98.

- Hjort of Ornas, A. and Christer K., "Environment and International Security", International Environmental Group Issue Paper, No.4, November 1991.
- Hoben, Allen, "The Origins of Famine - The Deadly Mix of Civil-War, Socialism and Depleted Soil", The New Republic (Washington), 21 Jan., 1985.
- Holdgate, Martin W. et al, eds., "The World Environment 1972-1982", A Report, Natural Resources and the Environment Series, UNEP, 1982.
- Holst, Johan Jorgan, "Security and the Environment : A Preliminary Explortion", Bullitin of Peace Proposals, Vol.20, No.2, 1989, pp.123-128.
- Holt, Julius and Seamen, John, "Contemporary Africa : Environmental Hazards", in Roland Oliver and Crowder, Michael, eds., The Cambridge Encyclopaedia of Africa (London : Cambridge University Press, 1981) pp.305-11.
- "Horn of Africa", Africa Quarterly : Special Issue, Vol.34, No.2, 1994.
- Horowitz, M.M. and Little, P.D., "African Pastoralism and Poverty : Some Implications for Drought and Famine", in Glantz, M.H.,ed., Drought and Hunger in Africa : Denying Famine a Future (Cambridge : Cambridge University Press, 1987).
- Independent Commission on International Humanitarian Issues, "Refugees : Dynamics of Development", A Report, 1986.
- Jacobson, Jodi, "Environmental Refugees : Yardstick of Habitability", Worldwatch Paper No:86, 1988.
- Kaplan, Robert D., "Ethiopian Exodus, Drought, Civil-War Refugees inundate Sudan", The New Republic (Washington; DC) 21 Jan., 1985.

- Karmeshu, V.P. Jain and A.K. Mahajan, "A Dynamic Model of Domestic Political Conflict Process", Journal of Conflict Resolution, Vol.34, No.2, June 1990, pp.252-69.
- Kebbede, Girma and Jacob Mary J., "Drought, Famine and the Political Economy of Environmental Degradation in Ethiopia", Geography Vol.73, No.318, pp.65-70.
- Kidane, Asmerom, "Demographic Consequences of the 1984-85 Ethiopian Famine", Demography, Vol.26, No.3, August 89, pp.515-22.
- Kloos, Helmut, "Development, Drought and Famine in the Awash Valley of Ethiopia", The African Studies Review, vol.XXV, No.4, 1982, pp.21-48.
- Kursany, I., "Peasants of the Nuba Mountain Region", Review of African Political Economy, No.26, 1983, pp.35-44.
- Lauren, P.G., "War, Peace and the Environment", in Barrett, R.N., ed., International Dimensions of the Environmental Crisis (Boulder, Colorado : Westview Press, 1982).
- Lemma, Hailu, "The Politics of Famine in Ethiopia", Review of African Political Economy, Vol.33, 1985.
- Leonard, H.J., "Political and Economic Causes of Third World Environmental Degradation", in Leonard, H.J., Divesting Nature's Capital: The Political Economy of Environmental Abuse the Third World (London : Holmes and Meier), pp.93-136.
- Libiszewski, Stephan, "What is an Environmental Conflict?" Environmental and Conflict Project (ENCOP), Occasional Paper No.1, Zurich and Bern, July 1992.
- Lofchie, M.F., "Political and Economic Origins of African Hunger", Journal of Modern African Studies, 13(4), 1975, pp.557-67.

- Luckham, R. and D. Bekele, "Foreign Powers and Militarism in the Horn of Africa", Review of African Political Economy, No.30, 1984, pp.8-20; No.31, pp.7-28.
- Markakis, John, "Famine and Politics in the Horn of Africa", Capital and Class, Vol.31, Spring 87, pp.16-23.
- Markakis, John, "The Ishaq-Ogaden Dispute", in Hjort A. of Ornas and Salih, M.A.M., eds., Ecology and Politics : Environmental Stress and Security in Africa, (Uppsala: Scandinavian Institute of African Studies, 1989), pp.157-167.
- Martin, Susan F., "The Inhospitable Earth", Refugees, No.89, May 1992.
- Mathews, Jessica T., "Redefining Security", Foreign Affairs, Vol.68, No.2, Spring 1989.
- Megisteab, Kidane, "Nature of the State and Agricultural Crisis in Post 1975 Ethiopia", Studies in Comparative International Development, Vol.24, No.1, Spring 1989, pp.20-38.
- Meyer, Carrie, "Migration Patterns Unravel the Population, Poverty, Environmental Tangle", Development, No.1, 1993.
- Milas, Seifulaziz, "Soil Erosion, Real Cause of Ethiopian Famine", Environmental Conservation, Vol.10, No.2, 1983, pp.157-159.
- Mische, Patricia M., "Ecological Security in an Interdependent World", Breakthrough, Summer/Fall 1989, pp.7-17.
- Mische, Patricia M., "Ecological Security and the Need to Reconceptualize Sovereignty", Alternatives, Vol.14, No.4, October 1989, pp.389-427.

- Molvaer, Reidulf K., "Environmental Co-operation in the Horn of Africa: A UNEP Perspective", Bulletin of Peace Proposals, Vol.21, No.2, 1990, pp.135-142.
- Molvaer, Reidulf K., "Environmentally Induced Conflicts? A Discussion Based on Studies from the Horn of Africa", Bulletin of Peace Proposals, Vol.22, No.2, 1991, pp.175-188.
- Mortan, Cf. J., "Ethnicity and Politics in Red Sea Province Sudan", African Affairs, Vol.88, No.350, January 1989, pp.63-76.
- Mortimer, Edward J., "New Fault Lines: Is a North-South Confrontation Inevitable in Security Terms?" Adelphi Papers, No.266, Part II, Winter 1991-92, pp.74-86.
- Moussalli, Michel, "The Challenge of the 1990's", Refugees, No.85, May 1991.
- Myers, Norman, "The Environmental dimension to Security Issues", The Environmentalist, Vol.6, No.4, 1986.
- Myers, Norman, "Economics and Ecology in the International Arena : The Phenomenon of 'Linked Linkages' ", Ambio, Vol.15 (10) 5, 1986, pp.296-300.
- Myers, Norman, "Linking Environment and Security", Bulletin of the Atomic Scientists, June 1987, pp.46-47.
- Myers, Norman, "Environment and Security", Foreign Policy, No.74, Spring 1989.
- Myers, Norman, "Population Growth, Environmental Decline and Security Issues in Sub-Saharan Africa", in Hjort A. of Ornas and M.A. Mohamed Salih, eds., Ecology and Politics : Environmental Stress and Security in Africa (Uppsala : Scandinavian Institute of African Studies, 1989), pp.211-231.

- Nitze, William A., "Swords into Ploughshares : Agenda for Change in the Developing World", International Affairs, Vol.69, No.1, 1993, pp.39-53.
- Novicki, Margaret A., "Ethiopia's drought and famine crisis", Africa Report, Vol.30, No.1, Jan - Feb., 1985, pp.47-49.
- Oberschall, Anthony, "Theories of Social Conflict", Annual Review of Sociology, Vol.4, 1978, pp.291-315.
- O' Connor, J., "Uneven and Combined Development and Ecological Crisis: A Theoretical Introduction", Race and Class, Vol.30, 1989, pp.1-11.
- Odingo, R., "Nomadic Pastoralist Migrations and Resource use Conflict in the Border Areas between Kenya and Somalia", Paper presented to the International Conference on Environmental Stress and Security convened by the Royal Swedish Academy of Sciences, Stockholm, 13-15 Dec., 1988.
- Office of Arid Lands Studies, Arid Land Newsletter, No.10, University of Arizona (Tucson), April 1979.
- Otlaway, Marina, "Drought and Development in Ethiopia", Current History, Vol.33, 1985, pp.23-32.
- Peluso, Nancy Lee, "Coercing Conservation? The Politics of State Resource Control", Global Environmental Change (Butterworth, U.K.), June 1993.
- Perry, B., "The real Cause of Ethiopia's Problems", Nature, Vol.319, 16 January 1986, p.183.
- Piddington, Kenneth W., "Sovereignty and the Environment : Part of the Solution or Part of the Problem?" Environment, Vol.31, No.7, 1989.

- Prins, Gwyn, "Politics and the Environment", International Affairs, Vol.66, No.4, October 1990, pp.711-730.
- Ramakrishnan, P.S., "Tropical Forests, Exploitation, Conservation and Management", Environment and Development, No.166, 1993, pp.149-162.
- Ravenhili, J., "The North-South Balance of Power", International Affairs, Vol.6, 1990, pp.731-748.
- Redda, Arya, "The Famine in Northern Ethiopia", Review of African Political Economy, Vol.27/28, 1984.
- Renner, Michael, M.Pianta and C. Franchi, "International Conflict and Environmental Degradation", in Vayrynen, Raimo, ed., New Directions in Conflict Theory (London: Sage Publications, 1991).
- Richards, P., "Ecological Change and the Politics of African Land Use", African Studies Review, Vol.26, No.1, 1983, pp.1-72.
- Riley, P. Stephen, "War and Famine in Africa", Conflict Studies, No.268, February 1994.
- Runnals, David, "Saving Earths' Atmosphere", Peace and Security, Vol.5, No.3, Autumn 1990.
- Salih, M. Mohamed et al., "The impact of War on the Sudan", Report Submitted to UNICEF, Sept., 1990, Nairobi.
- Sayigh, Yezid, "Confronting the 1990s : Security in the Developing Countries", Adelphi papers, No.251, Summer 1990.
- Schwab, Peter, "Political Change and Famine in Ethiopia", Current History, Vol.84, No.502, May 1985, pp.221-23.

- Somer's Emanuel, "Transboundary Pollution and Environmental Health", Environment, June 1987.
- Speth, James Gustave, "A Post Rio Compact", Foreign Policy, No.88, Fall 1992.
- Starr, Joyce R., "Water Wars", Foreign Policy, No.82, Spring 1991, pp.17-36.
- Stonehouse-Gamba, V., "Environmental Crisis : Causes or Consequences of International Conflict?", PRIO Report No.2, May 1992.
- Stover, William J. and Neil Mark, "Magazine Coverage of Ethiopia's Drought and Famine : A research note", International Review of History and Political Science, Vol.24, No.1, Feb'87, pp.57-63.
- Suhrke, Astri, "Environmental Degradation and Population Flows", Journal of International Affairs, Vol.47, No.2, Winter 1994, pp.473-496.
- Suliman, Mohamed, "Environmental Degradation and Migration in Africa", ENCOP/IFAA Sudan Paper II Oct.1992.
- Suliman, Mohamed, "Civil War in Sudan : From Ethnic to Ecological Conflict", The Ecologist, Vol.23, No.3, May/June, 1993, pp.104-109.
- Swain, Ashok, " Environment and Conflict : Analysing the Developing World", Report No. 37, Uppsala University, Uppsala; Sweden, 1993, pp.1-57.
- Swift, Jeremy, "Pastoral Development in Somalia : Herding Co-operatiives as a Strategy Against Desertification and Famine", in Glantz, Michael H., ed., Desertification : Environmental Degradation in and Around Arid Lands (Colorado : Westview Press, 1977), pp.275-305.

- Teitelbaum, Michael S., "The Population 'Threat'", Foreign Affairs, Vol.71, No.5, Winter 1992/1993.
- Thomson, J.T., "The Politics of Desertification in Marginal Environments : The Sahelian Case", in Leonard, H.J., ed., In Divesting Nature's Capital : The Political Economy of Environmental Abuse in the Third World (London : Homes and Meier), pp.227-262.
- Timberlake, Lloyd and John Tucker, "Environment and Conflict : Links between Ecological Decay, Environmental Bankruptcy and Political and Military Instability", Earthscan Briefing Document No.40, for International Institute for Environment and Development, London.
- Ullman, Richard H., "Redefining Security", International Security, Vol.8, No.1, Summer 1993.
- UNEP, Desertification Control Bulletin, U.N. Environmental Programme, No.10, May 1984.
- Vestal, Theodore M., "Famine in Ethiopia : Crisis of many dimensions", Africa Today, Vol.32, No.3, 1985, pp.7-28.
- Vestal, Theodore M., "Ethiopia's Famine A Many Dimensioned Crisis", World Today, Vol.41, No.7, July 1985, pp.121-128.
- Wallenstein, P., ed., "Food, Dependence and Conflict", Report No.29, Department of Peace and Conflict Research, Uppsala University, Sweden, 1988.
- Wallenstein, P., "Environmental Destruction and Serious Social Conflict", Developing A Research Design", PRIO Report, No.3, May 1992.
- Watts, M., "On the Poverty of Theory : Natural Hazards Research in Context", in Hawitt, K., ed., Interpretations of Calamity from the Viewpoint of Human Ecology (London : Allen and Unwin, 1983).

- Watts, M., "The Agrarian Question in Africa : Debating the Crisis", Progress in Human Geography, Vol.13, 1989, pp.1-41.
- Weiner, Myron, "Peoples and States in a New Ethnic Order?", Third World Quarterly, Vol.13, No.2, 1992.
- Weiner, Myron, "Security, Stability and International Migration", International Security, Vol.17, No.3, Winter 1992/93.
- Westing, A.H., "Environmental Component of Comprehensive Security", Bulletin of Peace Proposals, Vol.20, No.2, 1989, pp.129-134.
- Whitehead, A., "Food Crisis and Gender Conflict in the African Countryside", in Bernstein, B. Crow and M. Mackintosh and C. Martin eds., The Food Question : Profits Vs People? (London : Earthscan, 1990), pp.54-68.
- "Why the Poor Suffer Most : Drought and the Sahel", Report Published by Oxfam, 1984.
- Wijkman, Anders and Lloyd Timberlake, Is the African Drought an Act of God or of Man? The Ecologist, Vol.15, No.112, 1985.
- Wirth, David A., "Climate Chaos", Foreign Policy, No.74, Spring 1989.
- Zmolek, Mike, "Aid Agencies, NGO's and Institutionalisation of Famine", Economic and Political Weekly, Vol.25, No.1, January 6, 1990, pp.37-48.