Initial National Communication of Ethiopia to the United Nations Framework Convention on Climate Change (UNFCCC)

June 2001
Addis Ababa, Ethiopia
Initial National Communication of Ethiopia to the UNFCCC

Submitted to the COP through the UNFCCC Secretariat

IN OCTOBER 2001
ORGANIZATIONAL CHART OF ADMINISTRATION TO COPE WITH GLOBAL WARMING (Ad-Hoc Structure)

MINISTRY OF WATER RESOURCES

STEERING COMMITTEE
MoWR (NMSA), EPA, MEDAC, MoA, MoME, ESTC, AAU, AERO

EXPERT TEAMS

Working Group on GHG Inventory & Mitigation Assessment

Energy:
- Ethiopian Rural Energy Development & Promotion Center (EREDPC)
- Ethiopian Petroleum Enterprise (EPE)
- Road Transport Authority (RTA)

Land-use & Forestry:
- Ministry of Agriculture (MOA)

Agriculture:
- Ministry of Agriculture (MOA)

Industry:
- Chemical Society of Ethiopia (CSE)

Waste:
- Addis Ababa Health Bureau
- Addis Ababa Water & Sewerage Authority

Working Group on Vulnerability & Adaptation Assessment

Crops:
- Ethiopian Agricultural Research Organization (EARO)

Grassland & Livestock:
- Ministry of Agriculture (MOA)

Water Resources:
- Ministry of Water Resources (MoWR)

Forestry:
- Forestry Research Center (FRC) of Ethiopian Agricultural Research Organization (EARO)

Human Health:
- Ministry of Health
- Ethiopian Health & Nutrition Research Institute

Wildlife:
- Ethiopian Wildlife Conservation Organization (EWCO)

SECRETARIAT

CLIMATE CHANGE AND AIR POLLUTION STUDIES TEAM OF NMSA
1. CONTENTS OF THE NATIONAL COMMUNICATION

• An Executive Summary
• 10 Chapters
• 4 Annexes
### 2. NATIONAL CIRCUMSTANCES

<table>
<thead>
<tr>
<th><strong>GEOGRAPHY</strong></th>
<th>Located in the Horn of Africa, 3°-15° N latitude and 33°-48°E longitude, with an area of 1.12 million km² and complex topography</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLIMATE</strong></td>
<td>Diversified climate ranging from hot and semi-desert to mild and humid. There has been a warming trend in temperature over the past 50 years. The average annual minimum temperature over the country has been increasing by about 0.25 °C every ten years while average annual maximum temperature has been increasing by about 0.1°C every decade.</td>
</tr>
<tr>
<td><strong>HISTORY</strong></td>
<td>One of the ancient settlements and civilizations in the world with rich cultural and architectural heritages</td>
</tr>
<tr>
<td><strong>POPULATION</strong></td>
<td>53.5 million with growth rate of 3% per year in 1994 projected to be 129 million by 2030, the third largest in Africa after Nigeria and Egypt. 85% of the population live in rural areas.</td>
</tr>
<tr>
<td><strong>ADMINISTRATION</strong></td>
<td>Federal Democratic Republic</td>
</tr>
</tbody>
</table>
2. NATIONAL CIRCUMSTANCES

Cont...

<table>
<thead>
<tr>
<th>ECONOMY</th>
<th>In 1994 gdp per capita was $ 120 and sectoral shares to the national economy was agriculture (50%), industry (11 %), services (39%).</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY</td>
<td>Current energy consumption pattern is biomass 95 %, petroleum 4%, hydro 1%. the country has enormous potential of renewable energy resources such as hydro, solar, wind, biofuel, and geothermal. There are also non renewable source of energy such as natural gas and coal.</td>
</tr>
<tr>
<td>WATER RESOURCES</td>
<td>Ethiopia is known as the “water tower” of Northeast Africa. There are 12 major river/drainage basins many of which are transboundary. The total annual runoff from these basins is estimated at about 111 billion cubic meters. There are also eleven major lakes</td>
</tr>
<tr>
<td>LAND USE/ LAND COVER</td>
<td>Grazing and browsing (50%), cultivation (17%), forests and woodlands (24%)</td>
</tr>
<tr>
<td>WILDLIFE</td>
<td>9 national parks, 3 sanctuaries, 8 reserves and 18 controlled hunting areas</td>
</tr>
</tbody>
</table>
2. NATIONAL CIRCUMSTANCES

Cont...

<table>
<thead>
<tr>
<th>AGRICULTURE</th>
<th>Agriculture is the most important economic sector in the country. It directly supports about 85% of the population in terms of employment and livelihood. It contributes about 50% of the country’s gross domestic product (GDP). It generates about 90% of the export earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crop Production</strong></td>
<td>The production of crops is dominated by small scale subsistent farmers. Cereals, Pulses, Oil Seeds, Stimulants, Fruits, Sugarcane, Fibers, Vegetables, Tuber crops are produced. It is estimated that 16.5 million hectares (14.8% of the country) is under cultivation. About 73.6 million hectare (66%) of the country’s land area is estimated to be potentially suitable for agricultural production. The potential irrigable land in the country is about 3.7 million ha.</td>
</tr>
<tr>
<td><strong>Livestock</strong></td>
<td>Ethiopia has the largest livestock population in Africa and the tenth largest in the world. Currently there are about 88 million heads of livestock</td>
</tr>
<tr>
<td>BIODIVERSITY</td>
<td>Ethiopia is rich in flora and fauna with considerable endemism. She has the fifth largest flora in tropical Africa. The country is also one of the 12 Vavilov centres. 7000 species of higher plant, 277 terrestrial mammals, 862 species of birds, 201 species of reptiles, 63 species of amphibians are recorded so far.</td>
</tr>
</tbody>
</table>
2. NATIONAL CIRCUMSTANCES

Cont...

- Facts and Historical Data
- Natural Resources Potential

Generally Speaking

- Ethiopia is a Large Country with a Large Population, Endowed with Considerable untapped Natural Resource but a Least Developed Country
3. NATIONAL GHG INVENTORY

- Inventory of GHGs for the Years 1990-1995
- Covering Seven Gases CO$_2$, CH$_4$, N$_2$O, CO, NO$_x$, NMVOC, SO$_2$
- 4 Sectors Addressed: Energy, Agriculture, LUCF and Waste,
# GHG EMISSIONS IN ETHIOPIA

## 1994 (Gg)

<table>
<thead>
<tr>
<th>Sector</th>
<th>CO₂</th>
<th>CH₄</th>
<th>N₂O</th>
<th>CO₂ eq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>2,285</td>
<td>194</td>
<td>3</td>
<td>7,289</td>
</tr>
<tr>
<td>Industry</td>
<td>310</td>
<td>-</td>
<td>-</td>
<td>103</td>
</tr>
<tr>
<td>Agriculture</td>
<td>-</td>
<td>1,540</td>
<td>19.7</td>
<td>38,455</td>
</tr>
<tr>
<td>Waste</td>
<td>-</td>
<td>46</td>
<td>1.5</td>
<td>1,418</td>
</tr>
<tr>
<td>LUCF</td>
<td>-15,063</td>
<td>28</td>
<td>0.2</td>
<td>??</td>
</tr>
</tbody>
</table>

**Note:** LUCF stands for Land Use, Change, and Forestry, and the value is given as a net emission.
Sectoral Carbon Dioxide (CO$_2$) Emissions -1994

- Energy (FossilFuel Combustion): 88%
- Industrial Processes: 12%
CO₂ Emissions from the Energy Sector-1994

- Transport: 44%
- Manufacturing Industries and construction: 22%
- Commercial/institutional sector: 6%
- Residential: 17%
- Agr/Forestry/Fish: 3%
- Energy Industries: 8%
Sectoral Methane (CH$_4$) Emissions-1994

- Agriculture: 84%
- Energy (Fuel Combustion): 11%
- Waste: 3%
- Land-Use Change & Forestry: 2%
CH$_4$ Emissions in the Agriculture sector-1994

- Enteric Fermentation: 87%
- Prescribed Burning of Savannas: 10%
- Field Burning of Agricultural Residues: 0%
- Manure Management: 3%
Sectoral Nitrous Oxide (N₂O) Emissions -1994

- Agriculture: 81%
- Land-Use Change & Forestry: 1%
- Waste: 6%
- Energy (Fuel Combustion): 12%
4. GENERAL DESCRIPTION OF STEPS

- Assessment of Greenhouse Gas Mitigation Options
  - Models and expert judgment applied
  - 4 sectors addressed
    - Energy, LUCF, Agriculture, Waste
  - a number of win-win mitigation options identified,
    - Energy efficiency improvement
    - Renewable Energy Generation
    - Ethanol blending
    - Forest Preservation, Reforestation, Afforestation
    - Waste Composting
4. GENERAL DESCRIPTION OF STEPS

Cont...

• Vulnerability And Adaptation Assessments
  – Models, GCMs and Expert Judgment Applied
  – 6 socio-economic sectors addressed
  – crops, livestock, water resources, forestry, wildlife, human health
  – negative and positive impacts projected and a number of adaptation options identified
Year to Year Annual Mean Minimum Temperature Variability and Trend over Ethiopia

\[ y = 0.0251x - 0.6015 \]

\[ R^2 = 0.6834 \]
4. GENERAL DESCRIPTION OF STEPS

Cont...

• Policies, Programs and Measures Related to Climate Change
• Research and Systematic Observation
• Education, Training and Public Awareness
• Financial, Technological and Capacity Building Needs and Constraints
• Implementation Strategy and Monitoring
FINANCIAL, CAPACITY BUILDING NEEDS

• Data Collection and Monitoring
• Training
• Research and Studies
• Awareness Creation
• Development of National Climate Change Network
• Strengthening of the National Focal Institution
5. PROBLEMS

• Lack of Data and Information
• Inadequate Technical Expertize in Climate Change at National Level
• Inadequate Technical Backstopping Service to Provide Skills on Analytical Tools
• Lack of Access to Analytical Tools
• Low Level of Awareness About Climate Change at All Levels
6. RECOMMENDATIONS

- Strengthen National Coordination Mechanism
- Enhance National Technical Capacity Through Training
- Establish Data Base for Climate Change Research
- National Level Research in Climate Change Issues Need to be Continued and Enhanced
6. RECOMMENDATIONS
Cont...

• Establish a Network of National and Regional Experts

• Improvements in the Current UNFCCC Guideline for the Preparation of Non-Annex I National Communications

• Improvement in Accuracy of Climate Prediction

• Sustained Financial Support