Table of Contents

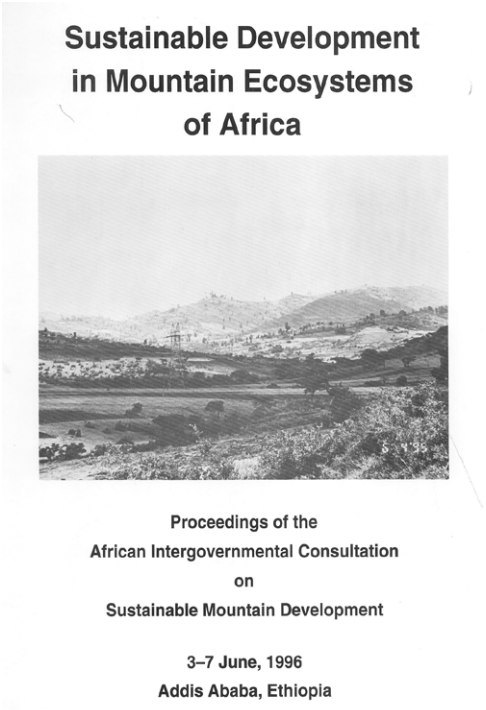


Table of Contents

Sustainable Development in Mountain Ecosystems of Africa

Proceedings of the African Intergovernmental Consultation on Sustainable Mountain Development 3-7 June, 1996 Addis Ababa, Ethiopia

Co-hosted by:

Ethiopian Environmental Protection Authority (EPA) and International Livestock Research Institute (ILRI)

Sponsored by:

Swiss Agency for Development and Cooperation Italian Cooperation Food and Agriculture Organization of the United Nations (FAO) United Nations Educational, Scientific and Cultural Organization (UNESCO)

Table of Contents

Introduction

The Organising Committee Intergovernmental Consultation on Sustainable Mountain Development in Africa

Background

The Governments at the United Nations Conference on Environment and Development (UNCED) noted that:

Mountains are an important source of water, energy and biological diversity. Furthermore, they are a source of such key resources as minerals, forest products and agricultural products and of recreation. As a major ecosystem representing the complex and interrelated ecology of our planet, mountain environments are essential to the survival of the global ecosystem. Mountain ecosystems are, however, rapidly changing. They are susceptible to accelerated soil erosion, landslides and rapid loss of habitat and genetic diversity. On the human side, there is widespread poverty among mountain inhabitants and loss of indigenous knowledge. As a result, most global mountain areas are experiencing environmental degradation. Hence, the proper management of mountain resources and socio-economic development of the people deserves immediate action.

The programmes of Chapter 13 of UNCED's Agenda 21 call for:

- generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems;
- promoting integrated watershed development and alternative livelihood opportunities.

The UN Commission on Sustainable Development (CSD) has also recognised that strategies for mountain development should empower mountain communities to exercise greater control over local resource management and conservation and generate income in sustainable and equitable ways. This requires combined and concentrated efforts of governments at the appropriate level, with the support of the relevant international and national organisations, NGOs, and regional intergovernmental consultations to promote initiatives aimed at raising awareness about the issues relating to mountain ecosystems. The Intergovernmental Consultation for Africa was held from 3 to 7 June 1996 in Addis Ababa, Ethiopia. This was the first time that African nations met to share views on sustainable mountain development as part of the follow-up to the Earth Summit held in Rio de Janeiro in 1992.

This publication provides the highlights from the presentations and discussions and the recommendations made, during the consultation which called for corrective policies and actions for enhancing sustainable development and environmental conservation in mountain ecosystems.

Consultation process

Delegations from 14 African nations, along with representatives of several intergovernmental and non-governmental organisations, gathered in Addis Ababa for a week-long consultation which aimed to:

- gain a better understanding of the major issues to be considered in developing sustainable mountain development strategies throughout Africa;

- draw attention of governments, regional organisations, non-governmental organisations, mountain people, and the general public to mountain issues and practices, and
- recommend strategies, including policy considerations, for the implementation of integrated sustainable development in the mountains of Africa.

The event was sponsored by the Swiss Agency for Development and Co-operation, Italian Co-operation, Food and Agriculture Organisation of the United Nations (FAO) and United Nations Educational, Scientific and Cultural Organisation (UNESCO), and co-hosted by the Environmental Protection Authority of Ethiopia (EPA) and the International Livestock Research Institute (ILRI).

The consultation was focused on four thematic areas: mountain environment and resources, management of mountain resources, human development in the mountains including women in development and highland/lowland interactions, but sustainability aspects and regional and subregional co-operation were common guiding principles. Country and regional developmental issues and priorities, organisational and institutional arrangements for action oriented follow-up were discussed during working group sessions. A field trip to the Andit-Tid project area in the central Ethiopian highlands provided the participants with an opportunity to appreciate the management constraints in mountain ecosystems and the urgent need for local and regional actions to reverse the continuing ecological damage.

African Intergovernmental Consultation on Sustainable Mountain Development

Conclusions

Recommendations

Preamble

From 3-7 June 1996, representatives from 13 African nations and more than 10 international organisations and NGOs, close to 70 delegates in all, met in Addis Ababa, Ethiopia, for the first African Intergovernmental Consultation on Sustainable Mountain Development.

African mountains are an important source of water, energy and biological diversity. They are also a source of such key resources as minerals, forest products and agricultural products, and are important for tourism. Widespread poverty among mountain inhabitants in Africa, however, is causing rapid changes in mountain ecosystems, as resource-poor farmers are forced to respond to economic and demographic pressures by overexploitation of natural resources. This often affects not only upland communities, but those living downstream as well. Hence, the proper management of mountain resources and the socio-economic development of mountain communities deserve immediate action.

This consultation was organised to allow African nations to address these concerns collectively and propose appropriate action. It was organised and co-hosted by the Environmental Protection Authority (EPA) of the Ethiopian Government and the International Livestock Research Institute (ILRI) of the Consultative Group on International Agricultural Research (CGIAR), under the auspices of the Food and Agriculture Organisation of the United Nations (FAO), the Task Manager of Chapter 13 of Agenda 21: "Managing Fragile Ecosystems: Sustainable Mountain Development". The financial support for the consultation was provided by the Swiss Agency for Development and Co-operation, the Italian Co-operation, FAO and UNESCO.

Based on the presentations and discussions held, the consultation delegates made the following recommendations in four priority subject areas, aimed at enhancing sustainable development and environmental conservation in mountain ecosystems.

1. Socio-economic issues

Strengthen community involvement at all levels and stages of decision-making in development processes in mountain areas, and develop a sense of community ownership and management of mountain resources.

Improve education and awareness to promote conservation and sustainable development of mountain areas through strengthening of mass media, school curricula, training of mountain community leadership, and facilitating interaction and capacity building in mountain communities.

- Alleviate poverty in mountain areas by promotion of alternative income generating activities, diversification and improvement of sustainable agricultural production, increased investment in and improved marketing of products and services from

mountain areas.

- Develop policy for the equitable distribution of benefits from mountain resources, and ensure that a percentage of revenue accruing from mountain areas be retained locally for sustainable mountain development and conservation.
- Increase awareness of, and take appropriate action to address population pressure on mountain ecosystems.
- Document and conserve cultural values which promote sustainable development in mountain areas and create awareness of cultural values which inhibit development.
- Combat illiteracy in mountain regions by providing basic education for all mountain communities, including functional literacy for adults and complementary primary education for children who are unable to attend school.
- Promote the empowerment of mountain communities for a greater role in decision-making in development processes and conservation efforts.
- Formulate and implement national policies on women based on the Beijing Platform of Action to, *inter alia*, promote the political, social and economic empowerment of women in mountain areas.
- Remove social injustice and inequity by promoting positive interaction and co-operation among communities and by creating greater awareness and respect for the cultural values of mountain communities.
- Put in place appropriate early warning systems and emergency measures in mountain areas prone to natural disasters.

2. Technical issues

- Build a research capacity which fully integrates biophysical and socio-economic development concerns and ensure that research findings are appropriately disseminated and applied.
- Improve and promote the use of existing developed, as well as traditional indigenous technologies by involving local communities and providing training in their application.
- Improve education and awareness methods by providing training in communications and extension to all groups involved in mountain development, and developing mountain-specific resource materials.
- Reinforce technical skills through training, information exchange and curriculum development and guidelines for natural-resource management.
- Improve environmental impact screening and assessment capacity in mountain areas and apply to all mountain development, including biophysical and socio-economic considerations, using best available technologies.
- Promote greater appreciation and application of appropriate traditional indigenous knowledge and strategies in natural resource planning and management.
- Promote land-use practices which are appropriate to the land capability and the needs of communities and discourage policies and processes that result in unsuitable use of natural resources in mountain areas.

- Water and biodiversity conservation should be given priority in mountain development programmes.

3. Legislative issues

- Harmonise legislative policies specific to mountain environments.
- Review, identify gaps and formulate new mountain-specific legislation which provides for community participation in decision-making and sharing of benefits from services provided by mountain resources.
- Develop regulations for environmental impact screening and assessment procedures for mountain land-use and integrated development which involve local communities in the management of public lands.
- Review legislation and promote an appropriate land tenure system and system of property rights, which recognise the importance of and supports community ownership and control of mountain resources, and gives special attention to women's property rights.

4. Institutional issues

- Establish or strengthen governmental and non-governmental institutions at all levels to develop and promote understanding of mountain ecosystems and their sustainable management, with special attention to ensuring strong co-ordination among all stakeholders, and in particular, research and development organisations.
- Create awareness among policy-makers regarding mountain development and conservation and include integrated sustainable mountain development as a priority in national development planning.
- Clarify the mission, functions and powers of governmental organisations regarding mountain development and management, and promote regional co-operation concerning the management and sharing of mountain resources, such as water.
- Strengthen local community-based institutions to promote involvement and ownership of development programmes in mountain areas.
- Ensure that the true value of resources emanating from mountain areas is recognised by government, and that adequate resources are allocated to mountain development.
- Promote networking for the development and conservation of African mountains that builds on existing collaborative efforts, such as the African Mountains Association (including support for national chapters) and the African Highlands Initiative. Such networking should enhance information exchange and monitor progress towards sustainable mountain development among participating institutions.

Resolution

The delegates to the African Intergovernmental Consultation on Sustainable Mountain Development urge governments, intergovernmental and non-governmental organisations to adopt the recommendations of this consultation concerning the sustainable development of African mountain ecosystems in the context of Agenda 21, Chapter 13, "Managing Fragile Ecosystems: Sustainable Mountain Development". The consultation urges governments to consider these recommendations in all national development policies and programmes, and to

collaborate at regional and international levels for sustainable mountain development.

7 June 1996.

Welcome address

Dr Akke van der Zijpp, Deputy Director General

International Livestock Research Institute (ILRI)

Addis Ababa, Ethiopia

Your Excellency, Dr Teketel Forsido, Minister of Agriculture of the Federal Democratic Republic of Ethiopia,

Distinguished Representatives from the 16 countries, Inter-governmental, and International Organisations,

Observers and Guests;

On behalf of the Director General of ILRI, the entire staff and on my own behalf, I welcome you all to the International Livestock Research Institute, Addis Ababa campus. ILRI is particularly honoured to have been selected as the venue for holding this unique and extremely important Intergovernmental Consultation on Sustainable Mountain Development in Africa. As you may know, ILRI is the newest centre of the Consultative Group on International Agricultural Research (CGIAR). The creation of ILRI just over a year ago, principally by bringing together the programme strengths of the former International Livestock Centre for Africa (ILCA) and International Laboratory for Research on Animal Diseases (ILRAD), fulfilled a desire of the international donor community to develop a unified global strategy for livestock research in the CGIAR system. ILRI has five research programmes: Animal Health Improvement, Utilisation of Tropical Feed Resources, Conservation of Biodiversity, Production Systems Research, Livestock Policy Analysis and Strengthening Collaboration with National Agricultural Research Systems (NARS).

Mountain ecosystems are a major source of the world's biological diversity, water, energy, minerals and agricultural products. These systems, particularly in Africa, are rapidly changing as resource-poor farming communities respond to increasing demographic and economic pressures by exploiting the natural resources beyond their regenerative capacity. Mountain areas are highly vulnerable to human misuse and ecological imbalance. Hence, the pressures for development to support human welfare in mountainous areas and for preservation of the quality of the natural environment may seem conflicting. These are, however, attainable goals if the development opportunities in mountainous areas are approached more sensitively to address user-problems. How we can collectively devise new strategies to safeguard our mountain resources while deriving full benefits from them will be a challenge for this meeting.

Recognising the fragile nature, acute resource management issues and pervasive poverty of people in the mountainous areas, the CGIAR, for its part, is supporting ecoregional and cross-ecoregional research efforts along the thematic areas: natural resources including biodiversity; land and water management; plant, animal and forestry production and socio-economics and policy, which closely match the themes of your meeting this week. As a CGIAR centre, ILRI is privileged to benefit from the views and outcome of this consultation and to share them with other institutes. Once again, ILRI is very pleased to have you all on its campus this week, and please feel free to call on us if we can be of assistance in making your stay enjoyable, useful and successful.

Opening address

Dr Teketel Forsido

Honourable Minister of Agriculture,

Federal Democratic Republic of Ethiopia

Honourable Participants of the Intergovernmental Consultation on Sustainable Mountain Development in Africa,

Ladies and gentlemen.

It is a great honour and privilege to address this distinguished gathering of scholars, researchers, development agents and policy makers of Africa who are committed to the sustainable use of mountain resources. Let me extend my heartfelt welcome to all of you to Ethiopia and to this very important Intergovernmental Consultation on Sustainable Mountain Development in Africa.

Sustainable development has become a widely accepted concept since the Rio de Janeiro Summit of 1992. But sustainability means different things to different people, and different things in different settings. The elements of sustainability perceived by Africans are thus likely to be different from those perceived by the peoples of the industrialised countries. They are also likely to be different for mountain and plains dwellers in Africa. What is expected from you is a clearer vision of what these elements are in African mountains and highlands and in the areas under the influence of mountain-lowland interactions.

Many tropical mountains are small in surface area and isolated. Human populations on them may, therefore, not reach the numbers required for effective socialisation, exchange of technologies and ideas to move a society continually to higher levels of cultural, political and technological achievements. But where the land mass is large, highlands have become socio-politically dominant. This is the case in Ethiopia, which has had old indigenous civilisations with substantial agricultural and technological achievements to its credit. The oldest remains of human and hominoid technology are found in the African Rift Valley. From dating implements, it is clear that technology then moved polewards and upwards.

Whilst in progress polewards at low altitudes, the human technological innovation can, on the whole, be expected not to run out of suitable areas for its territorial spread. Areas higher up in altitude, however, would soon become too small in size to foster the required level of socialisation to stimulate further development, unless contact with civilisations in extensive lowlands can be maintained. In reality, lowland technological centres have been moving further and further polewards, and civilisations of tropical mountainous areas have been too far away from their latitudinal equivalents to benefit from interaction. This and other historical phenomena, for example, forced isolation of Ethiopia, have for long contributed to a stagnating state of development. If Ethiopia had not been isolated, the need to compete with equivalent civilisations might have ensured that the "state" which once pioneered technological advancement would continue to develop at its old pace. In the histories of African mountainous regions and the continent at large, influences such as foreign invasions and interventions, wars and conflicts, pillage, and destruction among others, have no doubt had negative impacts which stunted development and produced the present sad technological, economic, and socio-political conditions in our various countries as well as the low international esteem in which our continent is held.

Peoples in mountainous regions of Africa share similar problems including population growth in excess of economic growth, deforestation, the increasing use of marginal lands and steep slopes for crop cultivation, diminishing fuel wood and grazing for livestock, large-scale soil erosion and loss of fertility, disruption of the hydrological cycles and depletion of ground water. The growing demands for agricultural and forestry products for exports and urban consumption are aggravating the net outflow of soil nutrients from the hillsides, with little efforts to compensate for them. These are problems largely arising from ambitiously wrong interventions in the name of development. These problems also apply to countries in the plains of Africa as well. However, the topography makes mismanagement in mountains and highlands more devastating. Therefore, compelling reasons obviously exist for mobilising regional and international efforts to formulate and implement strategies for sustainable mountain development. The fact that rivers which support large populations in countries on the plains are fed by rain that falls on the mountains and highlands adds weight to the urgency.

We would like to have various programmes for poverty reduction which, at the same time, enhance environmental care and benefit our populations, particularly our women and children. We want these programmes to involve our populations fully and not be imposed upon them. Without popular participation, we can expect little in development or in care for the environment. There is, therefore, a need for models of sustainable development built on local knowledge, capacities and opportunities so that they can be easily accepted and adapted for development, in particular, for rural poverty alleviation and for resource conservation in our mountain areas. I believe this is the purpose and the spirit of the decision of the world leaders at the 1992 Earth Summit in Rio de Janeiro when they endorsed Agenda 21, Chapter 13, entitled " Managing Fragile Ecosystems: Sustainable Mountain Development". We now call this the "Mountain Agenda". African countries, joining hands with the rest of the world, now have an opportunity to forge a consensus on what actions to take to help our peoples in mountainous areas lead better life.

In whatever way you define highlands or mountains, Ethiopia has the greatest share of high-altitude land mass in Africa. This being the case, the outcome and recommendations of this meeting will also be of the greatest significance to us. It is therefore appropriate that you decided to have this meeting in Ethiopia. I would like to thank the organisers for the choice of venue.

Ladies and gentlemen, may I wish you a most successful deliberation. I sincerely hope that your efforts will further the cause of development of the people living in the mountainous areas in Africa and contribute to the safety of the natural resources base so that it can serve also the millions who are yet to be born. I am happy that you will be going out to the field as a part of your consultation, which will provide you with an opportunity to see for yourselves how a sample of highland people live and interact with the environment. I hope that you will find the field trip informative. With the confidence that you will enjoy both your stay in Ethiopia and your deliberations on this unique issue, I declare this consultation open and wish you all the best.

Statement from FAO

Mr. G. Diagne

FAO Representative to Ethiopia

It is a great privilege for me to make the introduction to this consultation on behalf of FAO. This gives me the honour to welcome all of you coming from abroad and to convey to the distinguished delegations and observers, the greetings of the Director General of FAO, Dr Jacques Diouf, and bring to you his best wishes for full success in your deliberations.

In 1992, UNCED, commonly referred to as the Rio Summit, agreed on a comprehensive programme of action called Agenda 21, containing 40 different chapters which together encompass the broad array of issues covering environmental protection and sustainable development. Chapter 13 of Agenda 21 is entitled, "Managing Fragile Ecosystems: Sustainable Mountain Development" and focuses specifically on mountain lands. Essentially, it has two thrusts, firstly, to increase knowledge about the ecology and sustainable development of mountain ecosystems; and secondly, to promote integrated watershed development and alternative livelihood opportunities.

FAO has been designated Task Manager for Chapter 13 as well as three other chapters of Agenda 21. In this role, FAO has responsibility for reporting on accomplishments and activities relating to Chapter 13 to the UNCSD, and to promote and facilitate follow-up activity in the areas of information exchange, inter-agency consultation, catalysing joint activities and programmes, and developing common strategies.

Progress on the "Mountain Agenda" has been swift and significant, despite a rather late start compared to most other chapters of Agenda 21. FAO, in its Task Manager role, has initiated, in co-operation with host countries and concerned organisations, the convening of regional and intergovernmental consultations aimed at raising awareness and promoting action on sustainable mountain development. To date, intergovernmental meetings have been held in Asia and Latin America, with the European intergovernmental consultation, which has been organised in two linked sessions, now partially completed.

It is with much thanks to the EPA and ILRI, which have graciously offered to host and organise this African regional consultation, that we are able to meet here in Addis Ababa this week. Without the very generous financial support of the Swiss Government, the major sponsor of this event, and the contributions of the Italian Government, UNESCO and FAO, this consultation would not have been possible.

The UNCED process has also strongly encouraged NGO consultations to take place. Non-governmental organisations have made significant contributions to chapter 13 in the period leading up to and including UNCED, as well as throughout the follow-up period. Close collaboration between governments and NGOs has characterised this chapter throughout and, indeed, been recognised by the CSD as exemplary in all of Agenda 21.

Important NGO gatherings have taken place, the most notable being the International NGO Consultation on the Mountain Agenda which took place in Lima, Peru, in February 1995 and which brought together over one hundred NGO representatives from all over the world. On the regional level, a NGO mountain consultation for Europe is scheduled to occur in Toulouse, France in July 1996.

All of these regional consultations are expected to culminate in a wider international meeting that could take place in 1998. The fifth session of the CSD in April 1997 will review the five year follow-up to Agenda 21, and an extraordinary session of the UN General Assembly will be held in June 1997 to assess the implementation of the Rio agreements and agree on the action needed to follow up.

Here in Addis Ababa, this important consultation process continues, with focus now on the African context. It will be up to those of you attending this meeting to identify and debate the major issues related to sustainable mountain development as they pertain to this region. The range of issues will likely be very broad, given the great diversity of Africa's mountains and upland areas.

What can we expect to come of this consultation? The very fact that this meeting is taking place is an important step in the critical process of **raising awareness** and focusing more attention on mountain and highland ecosystems and the communities who live there. It is my hope that this meeting will also make real progress in identifying a reasonable number of elements for concrete action that truly respond to societal and local community needs toward sustainable development in mountain areas. New and improved forms of partnership at all levels will be important to promote more sustainable and comprehensive action. It will also be important to move forward on consolidating a network for the development and conservation of African mountains that builds on existing collaborative efforts.

Finally, I would like to mention that FAO stands ready to assist and support the active participation of African nations and institutions in the UNCED process. Assistance is available, for example, in the formulation of comprehensive mountain development programmes for poverty alleviation in mountain areas, and carrying out studies to gain a better understanding of resource flows to and from mountain regions. Ongoing work, which FAO is currently funding and co-ordinating to develop a set of principles and approaches for sustainable development in mountain areas, should also be of benefit to African countries. FAO's Assistant Director General of the Forestry Department has provided assurances to the commission that the organization will do all that is possible to support African institutions in such endeavours.

I wish you all a very successful outcome.

Statement by the delegation of Burundi

Burundi's relief divides the country into five main parts which coincide with the ecological regions, namely:

- the Western plains covering the natural region of Imbo and embracing 7% of the country with an altitude ranging from 780 and 1000 metres, an average temperature of 25°C, an annual rainfall of between 800 and 1900 mm and population density of about 200 inhabitants/km^2
- the western side of the Zaire-Nile ridge encompassing the Mumirwa natural region and covering 10% of the national territory with an altitude of between 1000 and 1900 m, a hilly topography with perpendicular slopes, an average temperature of 18°C, annual rainfall of between 1100 and 1900 mm and population density of 300 inhabitants/km^2
- the Zaire-Nile ridge embracing two natural regions--the Mugamba and the Bututsi--and covering 15% of the country with an altitude ranging from 1900 to 2500 m, an average temperature of 17°C, an annual pluviometry of between 1300 and 2000 mm, slopes of roughly 45° and population density of 300 inhabitants/km^2
- the central plateau occupying 52% of the national territory and containing several national regions with altitude varying between 1500 and 1900 m, an average temperature of 20°C, an annual rainfall of between 1200 and 1500 mm and population density of 300 inhabitants/km^2, and
- the depressions to the East comprising three natural regions--the Bugesera, the Buragane and the Moso--representing 16% of the national territory with an altitude ranging from 800 to 1300 m, an average temperature of 23°C annual rainfall of between 1000 and 1200 mm and population density of 120 inhabitants/km $^{2.}$

Thus, more than 75% of the national territory of Burundi is located in the mountainous region. This region, renowned for its hydrographic network and forests, is the most populated area of the country with a density of 300 inhabitants/km^2 and family farmlands of less than 1 ha on the average. The resultant demographic pressure has contributed to the overexploitation of arable land and the depletion of pasture and natural reserves, all for the purposes of agriculture. Moreover, the socio-political crisis facing the country since 1993 has hampered the effective implementation of the measures put in place by the Government of Burundi, such as:

- the establishment of a national environmental strategy
- creation of a national anti-erosion programme
- enactment of a rural code for the improvement of land management in the rural localities
- creation of parks and reserves, and
- establishment of projects for the promotion of integrated watershed development through the participation of the local population.

It is therefore undeniable that efforts combining the voluntary and active participation of the local population as well as subregional, regional and international support and collaboration remain a prerequisite for the restoration and rational management of the natural resources of the mountainous regions of Burundi.

Statement by the delegation of Cameroon

With 20% of its territory above 1000 m altitude, Cameroon is apparently the most mountainous country in Central and West Africa. To the East, it is dominated from the south to the north by mountain ranges known as the western mountain chains, the Cameroon watershed or the Cameroon ridge, in addition to countless chains of low altitude mountains and hills as well as isolated high grounds. Within these western mountain chains--1700 km long and 100 km wide--lies Mount Cameroon with a very humid equatorial climate and terrace-type vegetation. In the central part of this mountain are the principal plateaux of Cameroon dominated by a large number of mountains. In the northern part surges a range of massifs and hills typical of the Sudano-Sahelian and the Sahel regions.

The mountain ecosystems of Cameroon constitute the water towers *sine-qua-non* for agricultural production, and the reservoir for drinking/mineral water. Although covering an area of only 4,500 km^2 representing 1 % of the national territory, the mountain forests are an important source of foreign exchange for the country as *Pygeum* and *Stophnatus gratus* derived therefrom are commercialised. The region is a veritable tourist attraction thanks to its flora and fauna; and while agriculture is dominant in the valleys, foothills and even on mountain slopes, the summits are reserved for grazing.

Despite their ecologic and socio-economic importance, the mountains are subjected to heavy demographic, agricultural and pastoral pressures. Forest clearing and bush fires, overgrazing, poaching, excessive forest exploitation, and mountain settlements all combine with other phenomena such as violent winds, soil erosion and rock denudation from slopes to pose serious threat to the mountain ecosystems.

The Government of Cameroon has always been concerned with conservation of the mountains. This is evidenced by the various mountain biodiversity conservation and development projects that it has put in place. In spite of the laudable efforts deployed, numerous constraints, financial, technical, human, institutional and strategic, hamper the implementation of measures aimed at the management and conservation of the mountains.

In order to ensure the sustainable development of the mountains of Cameroon, it is apparent that the following actions and measures have become more than ever necessary:

- control of population growth
- elaboration of specific legislation on mountains
- mobilisation of financial resources towards mountain management
- subregional and regional co-operation for research and exchange of experience, and
- stepping up the support of the international community.

Statement by the delegation of Ethiopia

Ethiopia is mainly an agricultural country with an economy largely based on renewable natural resources. High plateaux and mountains with extensive lowlands are common topographic features of the country. The mountains and highlands are the main living places, and they are characterised by adequate rainfall, modest temperature, fertile soils and a large biodiversity. The highland regions with an altitude above 1500 m account for 44% of the total land area, 88% of the total population with an average population density of 64 persons per km^2, 95% of the total cropped area and two-thirds of the total livestock population.

The deterioration of the forest resources to 16% by 1954, and to 4 and 3% by 1975 and 1991 respectively is attributed to the rapidly growing demand for fuel wood and land for cropping and grazing, as well as to the significant increase in population (3.15% per annum). Because of the country's diverse ecological conditions a variety of agricultural practices and land-use patterns has evolved, some of which have devastating effects on the ecosystem.

Ethiopia is an important regional centre for biological diversity with the highlands considered as one of the most important crop biodiversity centres (Vavilov centres) in the world. However, the endowment of the genetic resources is threatened as a result of resource mismanagement and degradation. In spite of the existence of important historical sites and game reserves, and the spectacular nature of the mountainous terrain, the tourism sector remains underdeveloped, mainly because of the devastating civil war that prevailed in the country for the last two decades. The water resources, and other potential sources of energy, such as coal, natural gas and hydroelectricity, that could have reduced the pressure on the biomass energy are also not yet exploited. The recurrent droughts in the country, and the lack of appropriate soil and water conservation have also contributed to the degradation of the ecosystems in the highlands.

The mismanagement and degradation of the biodiversity in the Ethiopian highlands require urgent national and international action to ensure the conservation of the natural resources and to develop a rational system for their sustainable use. National efforts and improved approaches towards soil and water conservation and land improvements, and substantial investments for tourism and energy development are some of the areas that need to be given due attention.

Statement by the delegation of Kenya

The most prominent mountain forests in Kenya are found on Mt. Kenya, the Aberdares and Mt. Elgon. The gazetted forests cover 1.7 million ha or about 3% of the total land area and are mostly in the central highlands where population pressure is greatest. Ungazetted forest lands held in trust and private holdings account for 0.54 million ha. The extent and quality of gazetted forests are declining due to encroachment for agriculture, illegal exploitation of high-value timber species, uncontrolled fuel wood cutting, unavailability of proper forest utilisation and management plans.

In pursuit of the sustainable forest management, four forestry management actions have been identified:

- farm forestry to improve on tree management in private farms so as to reduce pressure on indigenous forests
- community forestry on communal and trust lands
- plantation forestry for wood based industries, and
- conservation and management of indigenous forests mainly on gazetted forests.

Donors, in appreciation of the Kenya Government's commitment to forestry conservation, are supporting various programmes involving:

- preparation of a Forestry Master Plan with the Finnish International Development Agency (FINNIDA)
- industrial plantation development and institutional strengthening with the World Bank
- natural forest management through community participation with the Overseas Development Association (ODA) and the European Development Association (EDF)
- farm forestry and plantation maintenance with World Food Programme (WFP)
- promotion of sustainable forest management with German Technical Co-operation (GTZ), and
- social forestry project with Japanese International Co-operation (JICA).

For the achievement of sustainable management and conservation of forestry resources, suggestions are made for:

- delineation between the role of beneficiaries and that of managers
- protection of forest-related values
- application of adequate silvicultural methods
- use of computerised database and/or information system for better management and monitoring
- provision of support for a revised forest policy and legislation, presently under progress, and

- strengthening of management planning with the assistance of collaborating institutions.

Statement by the delegation of Malawi

Malawi has several mountains and mountain ranges which form important catchment areas and habitats for a wide range of flora and fauna. Mount Mulanje in the south-eastern part of the country is the largest mountain in Malawi. The flora of this area is very diverse. Dense forests occur in ravines and valleys whereas the plateaux are covered with montane grassland and scattered trees and forest patches.

The Mulanje massif is a major catchment area and a source of water for an estimated population of 700,000. Lake Chinwa fishery depends on this water, which also supports hydropower and irrigated farming systems.

Mulanje mountain was gazetted as a forest reserve in 1927 and this compelled the government to regulate the utilisation of the mountain forest resources aimed at the protection of the water, flora, and fauna. As the communities around the mountain area are dependent on the mountain for the supply of fuelwood, poles, medicinal plants and other forest products, the current government policy has allowed free access to nontimber products as an incentive for people to participate in the management of the natural resources. This mountainous area also attracts tourism; however this sector has not been well developed because of the lack of access roads to the plateau. The south-west of the Mulange mountain is considered rich in high-quality bauxite deposit and plans are underway to exploit this resource.

Serious cases of encroachment and overexploitation of forest resources have become a problem as a result of the high population density estimated to be 185 persons per km^2, according to the 1987 national census. The exposure of the fragile escarpment that led to landslides and floods in the 1990/1991 rainy season could be cited as one of several unfortunate occurrences. The biodiversity of this ecosystem is also endangered by manmade wild forest fires.

Constraints to rational development include poor knowledge of the dynamics and management of indigenous forests, lack of silvicultural information on Mulanje Cedar, inadequate public forestry education, and shortage of funds. With these constraints in mind, the Forestry Department has come up with a project proposal with the main objective of identifying and instituting appropriate and effective management systems for sustainable development of the Mulange mountains. The project has divided into three phases: phase 1, a short feasibility study on the development of integrated resource management plan in phase 2 and the implementation process in the phase 3. In addition to this project, the Mulanje Mountain Trust has been established to promote the conservation of the flora and fauna.

The Mulanje mountain development is expected to be funded by the British ODA in 1997, and information generated from this project will be of great benefit for similar development of other mountains in the country.

Statement by the delegation of Nigeria

Mountains are recognised as a major ecosystem in Nigeria with the important mountains concentrated in the northeast and south-eastern part of the country. They are covered with forests and woodlands interspersed with rainforest. Two highlands, the Mambiea and Jos Plateau, are best known for their cattle production and other specialised agricultural production because of the near-temperate climate that prevails on them.

The sloping topography of the mountains and highland regions makes them more susceptible to accelerated soil erosion, and rapid loss of habitat and biological diversity. Under conditions of increasing population pressure, land has been cleared up on the slopes causing a reduction in forest cover and area available for grazing.

In 1991, a National Policy on Environment was put in place with the main thrust on sustainable development and conservation of natural resources. The policy also encompasses strategies that have direct relationship with the sustainable management of mountainous ecosystems, such as:

- strengthening knowledge and information systems related to mountain environment
- promotion of an appropriate land use planning and management for marginal lands
- supporting existing livelihood systems in marginal lands, and
- encouraging local community participation in natural resource conservation programmes.
- With the assistance of the World Bank, an Environmental Management Programme (EMP) was launched in 1994. The programme aims at strengthening knowledge and generating data through the establishment of databases and information systems to facilitate an evaluation of the Nigerian environment in its entirety, including the mountain ecosystem.

The marginal lands in Nigeria support about one fifth of the total population (18 million) and one third of the total cattle population. The degradation of watersheds, and the rapid deterioration of land and natural resources are having a devastating impact on the ecosystems as well as on the rural population of these regions. The national resources conservation action plan includes:

- an afforestation programme
- the discontinuation of land clearing and farming along the slopes through the enforcement of legal actions
- the promotion of intensive terracing in the farming systems of hilly and mountainous regions
- the promotion of agro-forestry practices, and
- the provision of alternative livelihood programme, such as bee-keeping and mushroom production.

In order to implement successfully the various action plans for environmental and natural resources conservation, the country needs the technical as well as the financial support of

regional and international organisations.

Statement by the delegation of Rwanda

Rwanda is a mountainous country with undulating topography, an altitude ranging from 900 to 4500 metres and rising from East to West. The country consists of three main regions: the Zaire-Nile ridges, the highland region and the moderate altitude region to the East.

Natural forests which are part of the mountain ecosystems, occupied an area of 451,160 hectares in 1994, representing 17% of the Rwandese territory (26,338 km^2). These forests are divided into two categories based on altitude:

- thick mountainous natural forests such as the natural forests of Nyungwe-Cyamudongo, Mukura, Gishwati national Parks around the volcanoes, and
- the natural formations to the East consisting of Akagera National Park, the Mutara game reserve, forest galleries and wooded savannahs.

Natural forests play a vital role in the maintenance of the water balance, the regulation of the climate, agricultural production and in the conservation of the biodiversity of the region. Major rivers take their source from the mountain forests; these include the Sebeya which emanates from the Gishwati forest, the Mbirurume and the Mwogo both of which spring from the Nyungwe forest. The lakes in the country also owe their existence to the forest galleries. At the biodiversity level, the natural forests around the volcanoes are highly rich in both animal and plant species.

Growing at an annual rate of 3.4%, the population has exerted considerable pressure on the natural forests. This situation has been compounded by the massive return of Rwandese from the diaspora. Furthermore, the Nyungwe forest is in the grips of a special problem provoked by the creeper weed *Sericostachys scandens* which strangles the trees, thus preventing seeds from falling on the ground to stimulate the natural regeneration of trees. Besides, water hyacinth constitutes a pest in most of the lakes in Rwanda.

The natural forest management and conservation projects set up by the government were adversely affected by the 1990 civil conflict in the country. The government is currently engaged in the process of installing displaced Rwandese in specially designated areas, and projects aimed at rehabilitating devastated forests have been developed by the Ministry of Agriculture and Livestock. Lack of institutional and financial capacities following the war and the genocide which left the economy in shambles, destroyed infrastructure and swept away human resources, remains the major constraint to the implementation of development projects and programmes in Rwanda.

Statement by the delegation of Sierra Leone

Sierra Leone is located on the Atlantic Coast of West Africa at the western end of the Upper-Guinea forest block. The country is topographically divided into four distinct physical regions: coastal plains with 14% of land area; interior plains with 43.4% of land area; plateaux with 12.8% of land area; and hills and mountains with 20.4% of land area. The plateau region contains the most important mountains in the country. Patches of small hills (2000-3000 ft high) rise from the plateau, but the most prominent mountain ranges are the Loma mountains with Bintumane peak rising to 6390 ft, as the highest peak in West Africa, and the Sankan Biriwa, at an elevation of 6080 ft the highest point of the Tingi Hills.

These mountain ranges, located in north eastern Sierra Leone, are characterised by montane communities similar to those on the Fouta Djallon (1500 m) and Simandou (1650 m) in the Republic of Guinea, Mount Nimba (1752 m) in Liberia and the Bamenda Highlands and Bauchi Plateau (1500 m) in Nigeria. Four vegetation types occurring at different altitudes are identified on these mountains: closed forests and Guinea savannah (460-915m), sub-montane shrub savannah (915-1700 m), montane grassland or prairie (above 1700 m), and sub-montane gallery forests in the valleys up to 1700 m.

Both Loma mountains and Sakan Biriwa are managed as non-hunting forest reserves with areas of 33,200 ha and 12,137 ha respectively. The land tenure system in these regions as well as in the other rural areas of Sierra Leone is that land is owned communally. Settlers around the mountains practice shifting cultivation resulting in the formation of farm bush and secondary forests along the slopes at various stages of succession.

Presently, there are no adequate management plans and practices to fully utilise the endowment of these ecosystems, other than regulation of hunting. For the sustainable development of these mountains ranges, the following measures need to be considered

- the effective use of forestry and water resources
- the exploitation of tourism
- the proper management of non-biological resources such as mining, and
- the application of a watershed management strategy to combat land degradation.

Suggestions are also made regarding the need for transboundary as well as subregional and regional collaboration in the design and implementation of an integrated development scheme for the mountainous ecosystems of Sierra Leone.

Statement by the delegation of the Republic of South Africa

Mountain areas are very important water sources in countries with a dry climate such as South Africa's. Two types of mountains are dominant in South Africa: those formed by erosion, such as the Natal Drakensberg, and those of volcanic origin such as Cape Fold Mountains. Most of the mountain ecosystems in the country are protected either as State forest areas, mountain catchment areas or nature reserves. There are, however, important mountainous regions in private or in communal land holdings.

The mountain environments, apart from their significance in water resources, are characterised by their biological diversity and the high levels of endemic plants and animals. The extensive archaeological heritage, particularly rock art, represents a unique cultural heritage, and the status of protection and the accessibility of most mountain areas in South Africa create great opportunities for tourism and outdoor recreation.

Despite the government policy for the protection and development of natural resources of mountainous areas, the conservation programme is faced with a number of challenges:

- Natural resource conservation has not been a top national priority.
- Despite past efforts to create public awareness and instil a national resource ethic, inadequate public awareness remains a constraint to progress.
- The lack of a multidisciplinary approach has failed to promote the concept of matching land use to natural resource base and community need.
- Uncoordinated programmes and actions coupled with lack of harmonisation in terms of legislation remain major resource-related problems.
- Limited community participation and inadequate land ownership rights have been detrimental to the implementation of policy and practice.

The conservation management practices of the Natal Drakensberg Park can be taken as examples that provide a model for integrated conservation and development for the South African mountain environment. The park is governed by a Board whose mission and policies are based on the natural values offered by this mountainous ecosystem, and on the longterm commitment to manage the system. The management programme includes among others:

- maintenance of grasslands for water conservation
- provision of nature based tourism facilities
- establishment of environmental education and awareness programmes
- valuation of the benefits of protected areas
- creation of a regional planning and control system that provides development opportunities both within and adjacent to the protected area
- feasibility of trans-boundary conservation and development programmes.

Protected areas have a fundamental role to play in the development and management of natural resources of mountain environments, and this is clearly demonstrated in the context of the Natal Drakensberg Park which can be viewed as a model for integrated conservation and

development.

Statement by the delegation of Tunisia

Bounded by the Mediterranean Sea, the Sahara and the Atlantic Ocean, North Africa presents relatively impoverished vegetation in spite of its diverse bioclimatic conditions and the existence of some native species and subspecies. Tunisia which is representative of this climatic condition, disposes of biocenoses similar to those of its neighbours, particularly north-eastern Algeria with which it shares several native plant species. More than a third of the country which has an area of about 16 million hectares, is made up of unproductive land, while the rest is arable land devoted to agriculture, grazing and forests.

Tunisia is, however, relatively poorer in habitats and plant species as a result of the absence of high altitudes (no cedar and fir forests, and no mountain vegetation terraces). It is nevertheless richer in oriental species such as *Cyclamen persicum* and *Prosopis stephaniana* which are not found in other countries of the Maghreb. According to the national forestry and pastoral inventory, the forests of Tunisia cover an area of 830,737 hectares, with a population of nearly 900,000 representing one-tenth of the total population of the country. This inventory made it possible for Tunisia to compile a comprehensive documentation of the vegetation using advanced techniques such as satellite picture processing, aerial photographs and computerised maps.

The natural forest formations in Tunisia have undergone considerable natural and human pressures as a result of droughts, fires, and the overexploitation of natural pastures and arable land. To combat this phenomenon which culminates in the degradation of the vegetation cover, the country since independence has enacted legislation aimed at the conservation, development and rational management of forest resources. It also set up institutions such as the Forestry Department within the Ministry of Agriculture, the Ministry of Environment and Lands as well as the National Institute for Forestry Research whose mandate includes natural resources conservation and development. Owing to the measures taken at the dawn of independence, it became possible, in particular, to:

- conserve the existing forests more often confined to the mountainous zones and areas with hilly topography
- train appropriate national staff, and
- develop large-scale actions for reafforestation and protection of oases and infrastructure from sand dune invasion and desertification.

Many plans and programmes, including those listed hereunder, have become operational, having taken account of the human dimension and concentrated on actions geared to achieving forest and forest-user balance:

- national plan for reafforestation and water and soil conservation aimed, among other things, at increasing the existing forest cover from 9% to 14%
- elaboration of a national plan for the protection of forests
- adoption of integrated forestry development projects in favour of the populations living in the forest regions, and
- preparation of a national environmental and sustainable development action plan for the twenty-first century.

The adaptation of the forestry policy to the peculiarities of the country has started yielding dividends that ensure harmony between forests and the population.

Statement by the delegation of Uganda

Uganda is a small landlocked country lying across the equator in eastcentral Africa with an area of about 236,000 km^2. The central part of the country is characterised by a gentle topography of flattopped hills and swampy valleys lying at an altitude of 1000 to 1500 m. In the west is the Rift Valley with its associated mountains and lakes while the east is associated with the large miocene volcanoes of Mts. Elgon, Kadam and Moroto.

The mountain ranges in Uganda are important catchment areas for many lakes and rivers, and are habitats for a wide variety of fauna and flora. Focus is made here on two of Uganda's mountains, namely, Ruwenzori in the west and Elgon in the east.

Ruwenzori is found on the border between Uganda and Zaire overlooking the west Rift Valley. It covers an area of 996 km^2 and has an extremely steep and rugged,mountain range which includes the third highest mountain peak in Africa (Marghenta, 5019 m). The natural vegetation comprises a broken montane forest below 2400 m, pure stands of bamboo from 2400 to 3000 m, a treeheath vegetation zone from 3000 to 3800 m and an Afroalpine moorland zone above 3800 m. Ruwenzori is one of the country's most important catchment areas with about half a million people dependent on its water resources. The hydroelectricity generated from this catchment caters for the needs of the Kilimbe mines as well as those of the communities. Exploitation of nontimber products, fisheries and irrigated agricultural production constitute the major activities in the region. Ruwenzori is best known for its game reserve which is inhabited by some endemic species, and prevailing hunting activities have posed a threat to the forest and to large animal populations in the region.

Mt. Elgon lies on the border between Uganda and Kenya, 100 km north-east of the Lake Victoria shoreline, and the international boundary divides the mountain into two roughly equal parts. The Uganda portion of the mountain covers an area of 1145 km^2, with altitudes ranging between 1460 and 4320 m. The mountain is an extinct volcano with one of the largest craters in the world 8-km across. It was gazetted a forest reserve in 1937, principally for its value as a water catchment and its broad masses of vegetations which form an ecosystem of mixed montane forest below 2500 m, a broad belt of bamboo and low canopy montane forest between 2400 m and 3000 m, high montane heath between 3000 and 3500 m, and high moorland above 3500 m. The mountain region is presently densely populated. Land shortage and overcultivation have contributed to declining land productivity and have led to encroachments on the forest reserve. With the recent designation of Mt. Elgon as a National Park, it is envisaged that such encroachments will be reduced; however, an extensive rural development project may be needed to provide alternative livelihood for the communities that have for long been dependent on the resources of the mountain.

As described above, both mountains, Ruwenzori and Elgon, are of ecological and economic importance to the nation. They have a long history of indigenous people living on them (the Batwa on Ruwenzori and the Ndoorobos or Benets on Elgon). Any development plans for the two mountains as well as for others in the country have to take safeguards into account to preserve the ecological, socioeconomic and cultural heritage of their mountain communities.

Statement by the delegation of Zaire

The Republic of Zaire with an area of 2,345,000 km^2, is replete with ecosystems that are among the richest and the most diverse in the world. Apart from the arid zones, coral reefs and marine islands, all tropical ecotypes, including mountain ecosystems, can be found in the country.

The mountain ecosystems of Zaire are part of the African Rift Valley. These ecosystems which are confined mostly to the eastern part of the country, have numerous volcanoes some of which are still active, four great lakes with immense hydrographic network and a temperate climate. Forests constitute the main source of energy for the population of the region which is considered to be the most densely populated area of the country. The mountain ecosystems are home to biodiversity which is among the richest in the world. This has facilitated the creation of national parks, including the national parks of Virunga and Kahuzi-Biega which have been placed on the list of sites regarded as world heritage by UNESCO.

The mountain ecosystems of Zaire, particularly the national parks, are subjected to considerable degradation as a result of their location at the heart of the most densely populated zones. Agricultural production methods, the land-use regime, high population density especially with the presence of a million Rwandese refugees, the search for new farm lands and harvesting of fuelwood are among the factors that have combined to exert very great pressure on ecosystems already rendered fragile by the hilly topography and torrential rains which create conditions for erosion and washing away of the soil.

In view of this complex scenario, the following recommendations have been put forward to ensure the conservation of the mountain ecosystems of Zaire:

- pursuing the reafforestation programmes and strengthening the German Technical Cooperation Project at Kahuzi-Biega, which integrates soil conservation and rural development.
- evaluation of the most susceptible sites in order to identify actions to be carried out, especially in view of the catastrophic situation in Rwanda.
- possibility of allocating part of the income derived from tourism to rural development projects.
- collaboration with the countries having common borders with Zaire to fight against poaching, and
- mobilisation of the international community for the resolution of the conflict in Rwanda which has disastrous impact on the mountain ecosystems of Zaire.

Statement by the delegation of Zimbabwe

Zimbabwe is divided into five agroecological zones with rainfall ranging between 400 to 1500 mm. The eastern highland representing 20% of the country's land is composed of a mountain range stretching 290 km along the border of Mozambique, and with the highest peak, Mount Nyankgani, rising 2600 m above sea level. The soil parent materials are dolerite, granite and alluvial and are found in the deep valleys within this mountain range. Commercial forestry and natural parks comprise 75 and 5% respectively of the eastern highlands while tea and/or coffee plantations, fruit trees, tobacco, maize, cotton and sugar constitute the remaining 20%.

The following are the four major land tenure systems in the region:

- large scale commercial farming areas (freehold)
- small scale commercial farming areas (freehold)
- resettlement areas (permit system)
- communal areas (communal)

Population pressure is the major cause of land degradation and its impact is manifested in the mismanagement of natural resources through deforestation, overgrazing, hill-slope and river-bank cultivation. These have led to serious soil erosion resulting in the choking of one of the main rivers (Save), with silt hampering the irrigation schemes in the lowlands.

In an effort to alleviate these problems, programmes and projects related to afforestation, irrigation, resettlement, ecotourism and conservation awareness campaigns have been put in place. As a result of the conservation awareness campaigns coupled with the application legislation and other programmes, the rural people are becoming aware of the need to conserve the environment and to call upon government and nongovernment agencies for assistance.

African Mountains Association

The African Mountains Association (AMA), is a non-governmental Pan-African organisation. It was formed in Ambo, Ethiopia, at the end of the African Mountain Workshop, 18-27 October 1986, in which about 50 scientists from 10 African countries and many others from other continents participated. The scientists, working in research and development on African mountains, felt that since the mountains of Africa are scattered throughout the continent, isolation is a very important deterrent to researchers and development agents working on these mountains and thus created the African Mountains Association to keep them together. The Association adopted a preliminary draft constitution.

The Association contributed to the discussions on the Mountain Agenda which led to the inclusion of a chapter on sustainable mountain development (Chapter 13) in Agenda 21.

The Association has since adopted a constitution. It has successfully launched two more continent-wide general meetings, one in Morocco and one in Kenya, and published proceedings which are now authoritative works of reference on African mountains. A third meeting is planned to take place shortly in Madagascar.

Initially, the Association was publishing an African Mountains and Highlands Newsletter from Asmara, Eritrea, but this discontinued because of financial and logistical difficulties which, it is hoped, will be solved shortly.

The Association has decided that its head office will be in Addis Ababa, but this has not yet opened. Depending on ability to raise the required funding, the Association is planning to open the office and restart its Newsletter.

Contribution of the OAU Coordination Office to the regional Contribution of the OAU Coordination Office project for the integrated management of Fouta Djallon

The massif of Fouta Djallon is composed of high and low plateaux cut into prolonged depressions along the edges. The massif represents 22% of the total land area of Guinea and covers mostly the middle regions of the country with extensions stretching along the bordering countries.

The climate of Fouta Djallon is characterised by a mountainous subtype of the SudanoGuinean climate with an average annual rainfall ranging between 1400 and 1800 mm, and an average temperature of between 21 and 25°C. This mountainous region, considered as the most important catchment area for the many rivers in West Africa, has earned the reputation of a real West African water tower.

The massif of Fouta Djallon is mostly populated by nomadic Fulani people and shelters 25% of the Guinean population; 85% of the inhabitants of the massif are mainly involved in agro-pastoral activities, including semi-sedentary and transhumant livestock farming.

Guinea has adopted a national policy and strategy for the management and conservation of its natural resources (water, soils, forests and fauna). The "Plan d'action forestier tropical (PAFT)", the "Plan national d'action pour Fenvironnement (PNAE)" and the "Lettre de politique de développement agricole (LPDA)" are among the institutional activities undertaken towards the management of natural resources in Guinea.

The hydraulic potential of the massif for the West African region led the Organization of African Unity (OAU), in 1981, to initiate the project "Regional Project for the Integrated Management of the Massif of Fouta Djallon" which received the support of quite a number of international organisations. This project, registered as a top priority within the framework of the OAU action plan to combat drought, desertification and calamities in Africa, focuses mainly on the sustainability of the hydraulic potential of the many international rivers taking their source from the massif, as well as on the improvement of the living conditions of the riverside populations.

The OAU has established an Office in Conakry, "Bureau de Coordination International (BCI)" whose main mandate is to monitor and harmonise the activities of this regional project. Phase I of the project (1981-1987) has helped to acquire additional knowledge and information about the massif of Fouta Djallon, to produce general and thematic maps and to propose an operation strategy for subsequent phases. The second phase which took off in 1988 is made up of two categories of projects: 12 vertical projects for the management of the pilot slopes identified in the central part of the massif, and 5 horizontal projects covering the totality of the massif and its extension areas in bordering countries.

Ten of the 12 vertical projects have been carried out with the support provided by the community of sponsors (United Nations Agencies, European Economic Community (EEC), "Fonds d'aide et de coopération" (FAC), United States Agency for International Development (USAID), etc.) whereas the horizontal projects were not given due attention. Despite the lack of funding for some components of the project and the insufficient participation of member states, the project still constitutes a unique experience as regards the management of natural resources and the vast pool of models drawn for the development of mountainous regions.

Thematic paper 1: African mountains and highlands and their natural resources

Leopold Gahamanyi

Projet Terre-Tany, c/o BUCO, B.P. 4052

Ambatobe, Antananarivo, Madagascar

African mountains and highlands cover an area of 3 million km^2. They influence climates and have a rich and varied fauna and flora. Poor management of water resources will jeopardize future quality of life.

Demand for new agricultural land and for energy or artisanal wood threatens the forests in this region. For example, Madagascar had lost more than 60% of its natural forests by 1985. The effects of deforestation are numerous. These include irregular rainfall, lowered water tables and loss of biodiversity.

Deforestation, aggravated by overgrazing, encourages soil erosion. Measurements taken in the eastern cliff area in Madagascar (Beforona) have shown insignificant soil losses in forest areas whereas in ginger crop lands, losses reached 143 t/ha. In addition to soil loss, erosion causes important losses of soil nutrients. The remaining soil becomes more acidic and low in phosphorus, calcium, magnesium and potassium. The soil is also unfit for agriculture because of the high aluminum toxicity.

Soil degradation results in reduced crop yields. Production increases in some tropical countries are due to cropping new (often marginal) lands. In most of these countries, there have been sharp decreases in food production. Between 1961-70 and 1987-91, food production growth rates decreased from 4.4% to 0.6% in Cameroon, from 3.2% to 1.6% in Madagascar and from 3.3% to 0.9% in Tanzania. During this same period, human population roughly doubled. There is clearly a need to manage natural resources in a sustainable manner to meet the present and future food needs.

It is vital to protect forests and watersheds to ensure regular rainfall. This requires an important effort in reforestation and erosion control. There is a need for studies aimed at increasing the quantity and quality of drinking water both in urban and rural areas to meet the needs of a growing population. In this respect, regional cooperation should be encouraged for the use of shared lakes and rivers to intensify irrigated agriculture where conditions are favorable.

There is a need to protect the remaining forests by involving surrounding populations in their management and to implement forest development projects capable of stimulating agricultural production and increasing farmers' incomes. It has been estimated that 25% of present animal and plant species will disappear by the year 2015 unless measures are taken to stop the degradation process. Conservation of biodiversity by creating parks, natural reserves or gene banks should help stop this trend. In 1991, the 24 countries that were part of the mountainous zone had 157 national parks totalling over 55 million ha in area and 442 protected areas covering a total of over 64 million ha. These forests, parks and reserves are of economic and ecological value. Unfortunately they are threatened by population increase, illegal trade in animals and plants, poaching, armed conflicts and lack of research and training programmes.

Research on soil rehabilitation has been carried out in most of the concerned countries. Traditional solutions have been proposed, including erosion control, manure use and improved fallows. However, the effect of this work is still limited due to many reasons such as lack of scientists, weak links between research and extension, insufficient involvement of farmers in the search for solutions etc. International research centres therefore have a role to play in supporting the efforts of national programmes in soil maintenance and improvement of fertility.

Thematic paper 2: Management of mountain resources

Tegegne Gebre Egziabher and Ogbaghebriel Barakhi

A.A. University, P.O. Box 1176, Addis Ababa, Ethiopia

Mountains in Africa are zones of high productivity and seats of vital resources. They are primary sources of water, agricultural land, favourable climate and centres of biological diversity. They have scenic grandeur and tourism potential. These characteristic features of African mountains necessitate their preservation and management.

In addition to this, a fundamental concern for management of mountain resources is the degrading resource-use patterns of the inhabitants. The existing resource-use in terms of forestry, water resource and agricultural land points at some management issues which must be carefully considered for sustainable development of mountain areas on the continent.

Vegetation changes and forest destruction are common in many parts of African mountains. Land clearing for agriculture, overgrazing, forest fire (deliberate or unconscious) and in some situations (Ethiopia, Sudan) civil strife and conflict are the main reasons for forest destruction. Forest destruction, in turn, has the effect of setting off a chain reaction of degradation affecting wild animals, soil and water.

Several forest-management practices exist, and there are African countries with experience in this regard. The immediate priority in forest management is protection of the remaining indigenous forest in the form of nature reserves and parks. This is very useful for upper-mountain forests which are sensitive to the slightest disturbances. Protection of the remaining forest in Rwanda and Burundi, designation of the upper parts of mount Kenya as a biosphere reserve by UNESCO, gazetting of two national parks in Ethiopia and declaration of areas above 1500 m as forest reserve in Jebel Mara in the Sudan are some instances of such management practices.

In areas where the natural forest cover is degraded, reafforestation is the main alternative. Indigenous or exotic trees can be planted. While indigenous trees are ecologically suitable, exotic trees are more productive and competitive with new land uses. Most of the experiences of reafforestation on African mountains are with exotic trees. In the mountains of Rwanda and Burundi, planting of pinus and eucalyptus is practised. In South Africa, plantations with exotic species now cover one million hectares or 1% of the total land surface. On the Jos plateau rehabilitation with eucalyptus tree had started earlier. In Ethiopia, between 1976 and 1985, massive afforestation has taken place. Some 500,000 seedlings were raised and planted in different parts of degraded catchments.

Forest management also involves adopting a new land-use system which integrates forestry with agriculture. In this regard, agroforestry, integrated land use in which trees are planted with crops, is found useful in forest management. Nearly all forest management practices require the participation of local people for their successful implementation.

In terms of water resources, changes in water regimes and water-resource degradation manifest themselves in a number of ways. These are reduced evaporation, declining water retention (storage) of the ground, reduction or lack of water during the dry season, accelerated runoffs and higher sediment yield. Vegetation changes and land use impacts are the main causes for changes in the water regime. This is noticeable in different parts of African mountains.

The fact that forests and land uses are closely related to water resources entail that watershed management is the best approach to water-resource management. Attempts on **watershed management** on African mountains include efforts on the slopes of Mt. Kenya, in the forest reserves of Jebel Mara, in the Semien mountains of Ethiopia and on the slopes of Morocco. Such efforts incorporate various activities such as forest protection, settlement prohibition, buffer zone development, and the like.

Another significant management issue of African water resources is the need for regional co-operation in river basin development. Most of the rivers originating in African mountains are international rivers and flow through a number of countries. Co-operative use of water is, therefore, essential. The Senegal river basin development project and the Niger Basin Authority fall in line with such co-operative uses and regional co-operation between the Nile countries should also emerge.

Agricultural land uses and more generally, farming systems, reflect the degree and nature of ecosystem manipulations. African agriculture, with few exceptions, takes place on mountains and highlands. The dominant types of agriculture are traditional, highly dependent on local ecological conditions and small-holder, mixed, rain-fed farming involving crop production and animal raising.

The major features of agricultural land uses on African mountains are intensification and expansion. Population pressure and unavailability of expandable land have resulted in intensification in the form of growing two crops a year, growing new plants such as vegetables and apples and increasing the size of flocks in some places such as Western Atlas. In Kenya, land use in medium and high potential zones was intensified in terms of production and space affecting the natural vegetation cover. In many parts of Africa, small-scale farms are extended to areas of lower potential which border high potential areas. Such extension to less suitable areas changes the land uses and leads to environmental degradation.

Several management issues arise from agricultural land uses on African mountains. Soil conservation is of utmost urgency. Improving grazing and land tenure, better integration between crops and livestock and piedmont development are other management issues that arise from existing land uses. Alternative livelihood systems that are less taxing on the environment as well as population control should also be part of the resource management strategies.

Though African countries have attempted various management practices, their efforts have not yet succeeded in averting the extent of degradation. Governments need concerted efforts in formulating land-use policies, creating awareness among local people and making them beneficiaries of the management practices.

Thematic paper 3: Human development in African mountains

Dr Esther I. Njiro

University of Nairobi, Institute of African Studies

P.O. Box 30197, Nairobi, Kenya

Human development is about efforts that lead to betterment of human life through planned and systematic changes, which increase the range of people's choices and capacities while decreasing their vulnerabilities. In mountainous African countries, there is a marked level of low human development manifested by poverty and hopelessness. Although poverty is a relative term, its indices are so prominent in Africa that it is almost tangible. Low levels of living standards and people's narrow range of choices are typical. This pathetic situation calls for urgent action by African countries and by the international community to root out the causes of the current conditions.

This report highlights the current issues of human development by analysing four major themes, namely:

- mountain cultures and organisation
- population and migrations
- women in development, and
- income generation.

Mountain Cultures and Organisation

African mountains are occupied by people of diverse cultural, ethnic and racial backgrounds. Unfortunately, this cultural diversity is misunderstood and used to incite incessant wars and conflicts.

There is need for each of the countries of the African mountains to formulate national policies which will facilitate orderly co-existence and appreciation of individual creativity and differences. Culture and organisation thus constitute a dynamic resource for human development, which needs promoting.

Population and Migrations

All mountainous African countries have an open population which allows for augmentation and depletion though immigration and emigration. There is a high growth rate of between 3-4% annually and high fertility rates. Unfortunately, high mortality rates and low life expectancy are discouraging phenomena.

The causes of most migrations in Africa are overpopulation, landlessness, poor agricultural productivity and a complex cultural notion that associates land ownership with life now and life after death. Search for education, off-farm employment, commerce and trade are other causes for migrations. In most cases, migrations have traumatic effects on the households.

Human migrations and population growth can bring about development if they are well organised and their disruptions minimised. Steps should be taken to stop forced migrations by

working on social and environmental causes. Mountainous African countries have suffered for too long from social and environmental refugees.

Women in Development

The status of women in all mountainous African countries depicts a dismal state of degradation and powerlessness. The indicators of their low status as women were pointed out by the Beijing Platform of Action during the United Nations Fourth World Conference on Women in 1995. They include:

- lack of adequate formal education
- poor access to information and technology
- high unemployment levels
- low awareness of legal rights
- low representation in the political process, and
- inadequate amenities e.g. water and energy

These problems can be addressed by focusing on eliminating their causes, as follows:

- Cultural traditions which allow discriminatory and which lead to the supremacy of men should be discontinued.
- The powerlessness of women is a condition that is perpetuated by subtle omissions and disregard of family problems in public law.
- Lack of access to education should be addressed by reinforcing free and compulsory education for all children with special efforts made to ensure that girls stay in school.
- Modern economic development which stresses on growth and monetary indicators has adverse effects on women who have no means of accessing loans for large-scale entrepreneurship. The structural adjustment programmes have made women poor shields of the poverty trap in mountainous African countries.
- Environmental degradation affects women most as they have to travel further in search of water and fuel.

The challenge to the governments of the African mountains is to realise that women's empowerment is a pivotal link to sustainable development. There is, therefore, a need to formulate and implement policies that empower women.

Income Generation

There has been a decline in per capita incomes marked by deteriorating unemployment and continuous loss of export market share for the mountainous African countries. Some causes are lack of focused priorities on income-generating activities, unmanageable external debt and disintegration of infrastructure for the market economy. The overall effect of this decline is severe economic hardship which threatens to cause disintegration of social and political systems.

We recommend diversification of income-generating activities and a restructuring which facilitates the market economy. The people's maximum participation in raising incomes can be ensured if they share in the benefits from their efforts.

Recommendations

The following are the recommendations of this report:

- There is need for cultural adjustments that facilitate human development. Formulation and implementation of national cultural policy in each of the African countries with mountains is an important starting point.
- Current haphazard population growth and forced migrations should be resolved. Peace, reconciliation and respect for human rights enhance human development.
- Gender and development policies should be adopted instead of the current women and development. Implementing the recommendations of the Beijing Platform of Action could address many of the problems facing women in the African mountains.
- Diversification of income-generating activities and equitable management of the mountain resources is important.
- Effective efforts to curb environmental degradation should be made by implementing public policy and institutions for promotion of genetic resources, their utilisation and conservation for sustainable human development.

Thematic paper 4: Panel discussion on highland-lowland interactions.

Report by Tegegne Gebre Egziabher

A.A. University, P.O. Box 1176, Addis Ababa, Ethiopia

Panellists:

- Dr Tewolde Berhan Gebre Egziabher, Chairman
- Professor Francis Ojany
- Representative of Intergovernmental Authority for Drought and Development (IGADD)
- A representative from Tunisia
- A representative from Cameroon

The panel discussion raised some issues that are pertinent to highland-lowland interaction:

- geological implications of highland-lowland interactions
- climatic interactions between highland and lowland
- interactions over use of water
- interactions over use of energy
- biodiversity
- disease and health in highland and lowland interactions.
- issues of War and peace and tensions about resource-use
- economic issues
- socio-economic issues, and
- culture-specific issues in terms of what is good and bad.

The impact of highland on lowland and lowland on highland needs to be ascertained for sustainable development. For example, waterflow from the Himalayan mountains and the impact of high mountain erosion and deforestation on the lowlands are well recognised in the region. Highland-lowland interdependence can become crucial for sustainable development of countries sharing geographical boundaries. For example, Lesotho has surplus water and South Africa has lowlands which can benefit and supply food grains to Lesotho if resources are exploited to mutual advantage. This could eliminate the need for Lesotho to cultivate or overcultivate its marginal highlands at the risk of major soil erosion. Tourism is one of the incentives for African countries to prevent their natural soil erosion and prevent further land degradation. But this is not very developed in many countries in Africa.

Mountains are major water sources, but the local inhabitants from whose land water is harvested are not consulted. There is deliberate and inadvertent marginalisation of mountain

communities. There is therefore a need for further research on assessing and developing land management systems compatible with full consideration of the welfare of local communities.

It is important to identify the root cause of environmental degradation, such as deforestation. People will continue to cut forests unless they have other sources of income. This affects the lowlands.

In some cases, attitudes are against trying new options and this can also hamper developmental efforts. For example, some people prefer to use fuelwood for cooking when they can use kerosene, because they think cooking with firewood makes food taste better. Biophysical research alone may not find the answer. People need to be sensitised to the potential benefits of a technology right from the very beginning.

Land degradation is a primary problem of the highlands. Equally, it is also a problem in the lowlands. Salinisation due to irrigation is one instance of lowland degradation. The ecological fragility of lowlands has to be considered. It is true that lowlands dominate highlands in all places. In Ethiopia, for instance, lowlands are arid and are used by transhument pastoralists and support only 10% of the total population. The highland-lowland continuum allows strategies for better use and conservation of biodiversity. In Ethiopia, arid regions are more diverse in species than the south-west wet plateaux and there are opportunities for adaptation of plant and animal species to various ecological niches. The crux of the matter of highland-lowland interaction is the issue of balance between the carrying capacity and land suitabilities. There is need to address the development of compatible land management so that natural resources of the highlands and lowlands are not exploited at the expense of each other. There is need for a research and development framework to assist countries with mountainous areas so that the natural resources can be safely exploited.

List of Participants

Burundi

1. Jean Paul Bitoga

Direction General de la Vulgarisation Agricole

Ministère de l'agriculture et de l'Elevage

B.P 149, Gitega

Bujumbura

Tel: (257) 402140

Fax: (257) 402097

2. Etienne Kayengeyenge

Directeur Général de 1'Aménagement du Territoire et de 1'Environnement

B.P 2847

Bujumbura

Tel: (257) 213257

Fax: (257) 228902

Cameroon

3. Bomba Celestin Modeste

Diplomate en service au Ministère des Relations Extérieures

Centre d'Etudes en Droit Environnement et Developpement Durable (CERDIE)

B.P 11261

Yaounde

Tel: (237) 21 42 34

Fax: (237) 21 42 34

4. Kamguem Dieudonne

Ministry of the Environment and Forestry

c/o NGOUNOU JUSTIN

PO. Box 5229

Yaounde

Tel: (237) 22 94 81

Fax: (237) 22 94 81

Ethiopia

5. Makonnen Loulseged

Head, Department of Basin Development Study

Ministry of Water Resources

PO. Box 10524

Addis Ababa

Tel: (251-1)611322/613242

Fax: (251-1)613279

6. Setargew Demilew

Team Leader, Natural Research Development and Environment Protection

Ministry of Economic Development and Cooperation

P .O. Box 1037

Addis Ababa

Tel: (251-1) 128965

Fax: (251-1) 550118/553844

7. Yadasa Dhinsa

Expert, Oromia Agricultural Bureau

P.O. Box 66, Akaki, Addis Ababa

Tel: (251-1)340241/510455 ext 1157

8. Tsedale Waktola

A/Department Head of Environmental Impact Study and Control

Environmental Protection Authority

P.O. Box 4243

Addis Ababa

Tel: (251-1) 183717

9. Asres Wolde Giorgis

Ministry of Mines & Energy

Energy Studies & Research Center

P.O. Box 486 Addis Ababa

Tel: (251-1) 150465

Fax: (251-1) 517874

Kenya

10. M J W Muniu

Project Manager, Conservation & Management of Indigenous Forests

PO. Box 30513

Nairobi

Tel: (254-2) 765204

Fax: (254-2)766856

11. Banda T S Amayi

Forest Department

Provincial Forestry Officer

Central Province

PO. Box 28

Nyeri

Tel: 0171 - 30959

Malawi

12. Benson M Chamba

Plantations Manager

Department of Forestry

Viphya Plantations

P.O. Box Chikangawa

Mzimba

Tel: (265) 343 222/343 215

Fax: (265) 343 208

E-mail: <615@remotel.msm.cgnet.com>

13. Harrison K T Ofesi

District Forestry Officer

Deptartment of Forestry

P.O. Box 398

Zomba

Tel: (265) 523251

Fax: (265) 522548

E-mail:<615 @remotel.msm.cgnet.com>

Nigeria

14. Macarthy Afolabi Oyebo

Asst. Director of Forestry

Federal Department of Forestry

P M.B. 135, Area Eleven

Garki, Abuja

09-2444552, 2344551

E-mail: c/o FAO-NGA@field.fao.org

Rwanda

15. Rwikilizwa Athanase

Forestry Engineer

Ministery of Agriculture

Forest Department

P.O. Box 621

Kigali

Tel: (250) 85782

Fax: (250) 76958

16. Karemera Gahirwa Protais

A/Head Department of Protection and Conservation of Natural Resources

Ministère de 1'Environnement et du Tourisme

B.P 2378

Kigali

Tel: (250) 7.7932/7.2093

Fax: (250) 7.9581/7.7454

Sierra Leone

17. Osmond L A Gordon

Director

Land and Water Development Division

P M B 187

Tel: (232) 22 222621/224713

Fax: (232) 22 229250

Telex: 3377 FAOREP SL

18. Hassan R S Mohammed

Acting Assistant Chief Conservator of Forests

Ministry of Agriculture and Natural Resources

c/o Forestry Division

Youyi Building, Brookfields

Freetown

Tel: (232) 223445

Fax: (232) 22 229250

Telex: 3377 FAOREP SL

Republic of South Africa

19. Trevor Sandwith

Head of Planning

Natal Parks Board

P.O. Box 662

Pietermaritzburg 3201

Tel: 27 331 47-1961

Fax: 27 331 47-1173

E-mail: Trevors@npb.co.za

20. Keith P Taylor

Deputy Director

Directorate Agricultural Resources Conservation

National Department of Agriculture

P.B. X120

Pretoria 0001

Tel: 27 12 319 7687

Fax: 27 12 329 5938

Tunisia

21. Selmi Taieb

Ingenieur Général

Ministere de 1'Agriculture

30 Rue Alain Savary a Tunis

Tel: 216 1 286 892

Fax: 216 1 801 922

E-mail: FAO-Tun@field.fao.org

22. Abid Habib

Chef de laboratoire et Chef de Service des Aménagements

Ministère de l'Agriculture

Direction Générale des Forêts

30 Rue Alain Savary-1002 Tunis

Tel: 216 1 287487-216 1 891 141

Fax: 216 1 801922

E-mail: FAO-Tun@field.fao.org

Uganda

23. Sebukera Charles

National Environment Management Authority

P.O. Box 22255

Kampala

Tel: 256 41236817

Fax: 256 41232680

NEIC@STARcom.ug.co

24. Gershom Onyango

Forest Department

Ministry of Agricultural Resources

P.O. Box 7124

Kampala

Tel: 256 41 233485

Fax: 256 41 256918

Zaire

25. Etumesaku Djunganumbe

Ministère de l'Environnement

CIC/ECNT

B P 12345

KINSHASA I

Tel: 33250/33251

E-mail: FAO-ZAR@ field.fao.org

26. Zasy Ngisako

Ministère de 1'Environnement

C/O SPIAF

B P 10120, Kinshasa I

C/O Representation de la FAO au Zaire

B P 16.096 Kinshasa I

Boulevard du 30 Juin

Building de la 2^{e} Republique

Kinshasa/Gombe

Tel: 33250/33251

E-mail: FAO-Zar@field.fao.org

Zimbabwe

27. Charles Nyikaramba

Ministry of Enviroment and Tourism

Department of Natural Resourses

Extension Services

Box 585, Mutare

Tel: 263 20 62509

Fax: 263 20 67098

Other Organisations/ Institutions

AMA

29. Francis F Ojany

President, AMA

c/o Department of Geography

University of Nairobi

P O. Box 30197, Nairobi

KENYA

Tel: (254-2) 217924/334244

Fax: (254-2) 336885/712923

Fax: (254-2) 583568 (Res)

EWNHS

30. Tilaye Negussie

Programme Coordinator

Ethiopian Wildlife and Natural History Society

P.O. Box 12042

Addis Ababa

Tel: (251-1) 61 48 38

FAO

31. Gana Diagne

FAO Representative to Ethiopia

P.O. Box 5536

Addis Ababa

ETHIOPIA

32. Douglas McGuire

Forestry Officer

Forest Resources Division

Viale delle Terme di Caracalla

00100 Rome, ITALY

Tel: (39-6) 5225 3275

Fax: (39-6) 5225 5137

E-mail: douglas.mcguire@fao.org

CDE

33. Karl Herweg

Centre for Development & Environment (CDE)

Institute of Geography, University of Berne

Hallerstr. 12, CH-3012, Berne

SWITZERLAND

Tel: 41 31 6318822

Fax: 41 31 6318544

E-mail: herweg@giub.unibe.ch

ICRAF

34. Kwesi Atta-Krah

ICRAF

P.O. Box 30677, Nairobi

KENYA

Tel: 254-2 521450

Fax: 254-2 521001

E-mail: K.Atta-Krah@cgnet.com

IGAD

35. Ali Ahmed Saleem

Intergovernmental Authority on Development (IGAD)

P.O. Box 2653, Djibouti

Tel: (253) 354050/352880

Fax: (253) 356994/356284

ILRI

36. Akke van der Zijpp

Deputy Director General

ILRI-Kenya

P.O. Box 30709, Nairobi KENYA

Tel: (254-2) 630743

Fax: (254-2) 631499

E-mail: A.van der Zijpp@cgnet.com

37. Simeon Ehui

Programme Leader

Livestock Policy Analysis

ILRI-Ethiopia

PO. Box 5689, Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

E-mail: S.Ehui@cgnet.com

38. Jean Hanson

Programme Leader

Conservation of Diversity

ILRI-Ethiopia

P.O. Box 5689, Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

E-mail: J.Hanson@cgnet.com

IUCN

39. Guido Broekhoven

Coordinator

The World Conservation Union

IUCN Regional Office

P.O. Box 68200, Nairobi

KENYA

Tel: (254-2) 890605-12

Fax: (254-2) 890615

E-mail: AJB@EARO.IUCN.CH

LEM-Ethiopia

40. Assegid Bezabih

Environment and Development Society of Ethiopia

PO. Box 8632, Addis Ababa

ETHIOPIA

Tel: (251-1) 155969

Fax: (251-1) 513851

SCRP

41. Dawit Kebede

Head, Soil Conservation Research Programme

P .O. Box 3062

Addis Ababa

ETHIOPIA

Tel: (251-1) 512771

UN-ECA

42. Sarim-Kol

UNECA

P .O. Box 3001

Addis Ababa

ETHIOPIA

Tel: (251-1) 517200 x 236

Fax: (251-1) 514416

UNICEF

43. Harry Philippeaux

UNICEF-Ethiopia

Addis Ababa

ETHIOPIA

Tel: 251-1-515155/513304

Fax:251-1-511628

E-mail: UNICEF@padis.gn.apc.org

44. Birendra Shrestha

UNICEF-Ethiopia

Addis Ababa

ETHIOPIA

Tel: 251-1-515155/513304

Fax: 251-1-511628

E-mail: UNICEF@padis.gn.apc.org

UNESCO

45. Livingstone Dangana

UNESCO Nairobi Office

UN Complex, Gigiri

P.O. Box 30592

Nairobi

Tel: (254-2) 62 26 16

Fax: (254-2) 21 59 91

WMO

46. Bekuretsion Kassahun

Deputy General Manager

National Meteorological Services Agency

P.O. Box 1090

Addis Ababa

ETHIOPIA

Tel:(251-1) 516308

Fax:(251-1) 517066

WWF

47. Jean-Pierre d'Huart

World Wide Fund for Nature (WWF)

P.O. Box 62440

Nairobi

KENYA

Tel: (254-2)332963

Fax: (254-2)332878

E-mail: WWFEARPO@ARCCPERMANET.ORG

OAU

48. Ibrahima Kegneko Diallo

OAU, Project for the Integrated Development of the Fouta-Djallon Highlands

PO. Box 1386, Conakry

GUINEA

Tel: (224) 441395

Fax: (224) 412522

Telex: 22423

Authors of Theme Papers

49. Esther I Njiro

Institute of African Studies

University of Nairobi

P.O. Box 30197, Nairobi

KENYA

Tel: 254-2-334244 ext.28053 (off) 254-2-600410 (Res)

Fax: 254-2-718264

50. Leopold Gahamanyi

Responsable du Projet Terre-Tany

c/o BUCO, BP 4052

Ambatobe, Antananarivo

MADAGASCAR

Tel: 261-2-41463

Fax: 261-2-41463

E-mail:gahamany@terretany.fofifa.mg

51. Tegegne G/Egziabher

Department of Geography

Addis Ababa University

P O. Box 1176, Addis Ababa

ETHIOPIA

Tel: (251-1) 11 78 27

52. Ogbaghabriel Barakhi

Addis Ababa University, Addis Ababa

P.O. Box 31527

Tel: (251-1) 11 78 27 (office)

(251-1) 12 11 02 (res.)

Interpreters

53. Maria-Lily Pavlidis

P.O. Box 40076, Nairobi

KENYA

Tel: (254-2) 226870

Fax: (254-2) 226870

54. Lucas Amuri

P.O. Box 54708

Nairobi, KENYA

Tel: (254-2)564000

Fax: (254-2)562214

Telex: 22925/22912 PUBLINRB

c/o UNDP; Nairobi

55. Hervé Songre

IITA-Ibadan

Oyo Road

PMB 5320, Ibadan

NIGERIA

Tel: (234-2) 241 2626

56. Oscar Hounvou

c/o IITA

Oyo Road

PMB 5320, Ibadan

NIGERIA

Tel: (234-2) 241 2626

Fax: EMMARSAT (874) 1772276

E-mail: Internet IITA@CGNET.COM

Tour Organisers

57. Yohannes G/Michael

Soil Conservation Research Programme

P.O. Box 33569 Addis Ababa

ETHIOPIA

Tel: (251-1) 51 02 09/51 27 71

58. Abate Tedla

Highlands Research

ILRI-Ethiopia

P .O. Box 5689

Addis Ababa

ETHIOPIA

Tel: (251-1) 61 32 15

Fax: (251-1) 61 18 92

59. Abiye Astatke

Highlands Research

ILRI-Ethiopia

P.O. Box 5689

Addis Ababa

ETHIOPIA

Tel:(251-1) 61 32 15

Fax:(251-1) 61 18 92

Organising Committee

60. Tewolde Berhan Gebre Egziabher

Patron, African Inter-Governmental Mountain Consultation

c/o P. O. Box 5689

ILRI Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

61. Girma Hailu

Chairman, Organising Committee

African Inter-Governmental Mountain Consultation

c/o P.O. Box 5689

Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax:(251-1) 611892

62. Mohamed Saleem

Secretary, Organising Committee

African Inter-Governmental Mountain Consultation

P.O. Box 5689, Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

63. Mohammad A Jabbar

Member, Organising Committee

African Inter-Governmental Mountain Consultation Secretariat

P.O. Box 5689

Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

64. Aguibou Tall

Member, Organising Committee

African Inter-Governmental Mountain Consultation Secretariat

P. O. Box 5689

Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

E-mail: A.Tall@cgnet.com

65. Leticia C Padolina

Consultant/Logistic Coordinator

African Inter-Governmental Mountain

Consultation Secretariat

P .O. Box 5689

Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

E-mail: l.padolina@cgnet.com

66. Genet Delelegn

Secretarial Assistant ILRI

P.O. Box 5689

Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: (251-1) 611892

67. Addisu Mekonnen

Member, Organising Committee

African Inter-Governmental Mountain Consultation

c/o P .O. Box 5689

Addis Ababa

ETHIOPIA

Tel: (251-1) 613215

Fax: 251-1) 611892

68. Abebe Wodajo

Member, Organising Committee

African Inter-Governmental Mountain Consultation

C/o P. O. Box 5689

Addis Ababa

ETHIOPIA

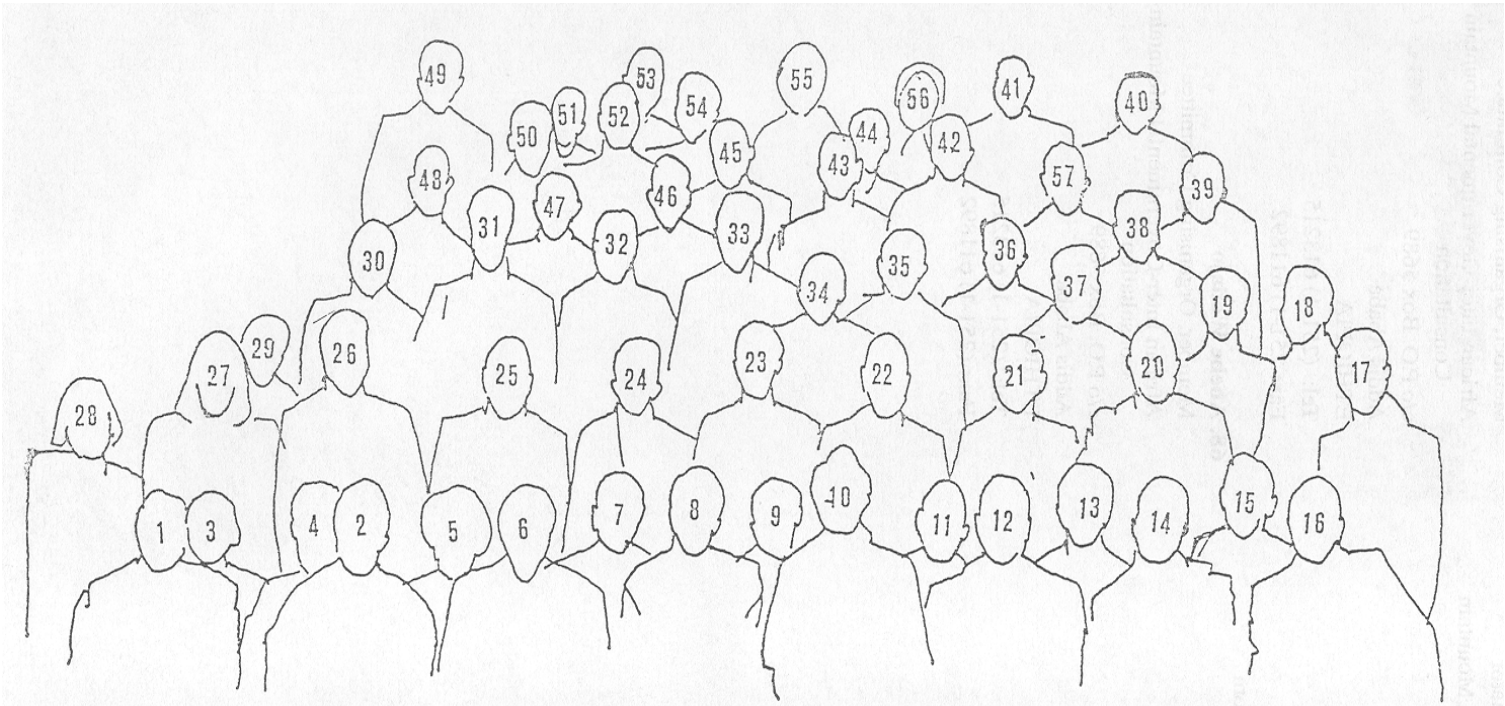
Tel: (251-1) 613215

Fax: (251-1) 611892

African Inter-Governmental Consultation on Sustainable Mountain Development

03–07 June 1996

International Livestock Research Institute (ILRI), P.O. Box 5689, Addis Ababa, Ethiopia



1. L. Dangana
2. Selmi Taieb
3. Ali Ahmed Saleem
4. Tsedale Waktola
5. Esther Njiro
6. Tewolde Berhan G/Egziabher
7. Francis F. Ojany
8. H.E. Teketel Forsido
9. Gershom Onyango
10. Akke van der Zijpp
11. Etumesaku Djugamumbe
12. Gana Diagne
13. Douglas McGuire
14. Aguibou Tall
15. Mohammed A. Jabbar
16. Girma Hailu
17. Mohamed Saleem
18. Kwes Atta-Krah
19. Mekonnen Leulseged
20. Banda Amayo
21. Keith Taylor
22. M. A. Oyebo
23. Trevor Sandwith
24. Sarim Kol
25. Athanase Rwikinizwa
26. Leopold Gahamanyi
27. Jean Hanson
28. Leticia Padolina
29. Abebe Wodajo
30. Herve Songre
31. Bitoga Jean Paul
32. B.M. Chamba
33. H. K. Ofesi
34. Sebukera Charles
35. Birendra Shrestha
36. Tegegne G/Egziabher
37. M.J. Muniu
38. Kamguem Dieudonne
39. Setargew Demilew
40. Yohannes G/Michael
41. Simeon Ehui
42. Ogab Michael Beraki
43. Abid Habib
44. Karemera G. Protais
45. Dawit Kebede
46. Bomba Celestin
47. Etienne Kayengeyenge
48. Zasy Ngisako
49. Yedeta Dinsa
50. Assegid Bezabih
51. C. Nyikaramba
52. Karl Herweg