Climate Change Mitigation in Africa

Proceedings of an International Conference
Elephant Hills Hotel, Victoria Falls, Zimbabwe, 18 – 20 May 1998

Edited by

Gordon A. Mackenzie, John K. Turkson and Ogunlade R. Davidson

SOUTHERN CENTRE FOR ENERGY AND ENVIRONMENT

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CLIMATE CHANGE MITIGATION IN AFRICA

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Foreword

The UNEP Collaborating Centre on Energy and Environment (UCCEE) in conjunction with the Southern Centre for Energy and Environment (SCEE) hosted a conference on "Climate Change Mitigation in Africa" between 18 and 20 May. The conference took place at the Elephant Hills Hotel, Victoria Falls, Zimbabwe. The Conference addressed issues related to climate change mitigation in African countries and sub-regions; in particular in the light of the latest developments of the United Nations Framework Convention on Climate Change reached at Kyoto in December 1997. Specifically the conference presented and discussed a standard methodological approach for mitigation analysis developed over the past seven years and applied in a number of country studies in Africa.

The Conference was held as part of the final stage of the UNEP/GEF project "Economics of GHG Limitations". Similar regional conferences were held in Asia, Latin America and Eastern Europe. The conferences provide a basis for outreach in terms of directly informing and supporting other countries in the regions on the methodological aspects and specific experiences obtained by the participating countries, including national and regional mitigation collaboration possibilities.

The Conference set out to address the following main objectives:

- to present to a wider audience the results of UNEP/GEF and related country studies
- to present results of regional mitigation analysis
- exchange of information with similar projects in the region
- to expose countries to conceptual and methodological issues related to climate change mitigation
- to provide input to national development using climate change related objectives

This volume contains reports of the presentations and discussions, which took place at the conference at Victoria Falls between 18 and 20 May 1998. Representatives of 11 country teams made presentations and in addition two sub-regions were discussed: the Maghreb region and SADC. The conference was attended by a total of 63 people, representing 22 African countries as well as international organisations.

Gordon A. Mackenzie, John K. Turkson and Ogunlade R. Davidson
UNEP Collaborating Centre on Energy and Environment
Risø National Laboratory
October 1998

Organising Committee

Dr. Gordon Mackenzie (chairman), UNEP Collaborating Centre
Prof. Ogunlade R. Davidson, UNEP Collaborating Centre
Dr John K. Turkson, UNEP Collaborating Centre, and
Dr R.S. Maya, Southern Centre for Energy and Environment, Zimbabwe

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Prof. Mark J. Mwandosya, Tanzania
Dr Faouzi Se nhaji, Morocco
Dr Youba Sokona, Senegal
Prof. Francis D. Yamba, Zambia
Dr Peter Zhou, Botswana

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Opening address: Hon. SK Moyo, Minister of Mines, Environment and Tourism, Government of Zimbabwe

(Address delivered by Mr. C. Chipato, Permanent Secretary, Ministry of Mines, Environment and Tourism, Government of Zimbabwe)

Mr. Chairman, his Excellency Erik Fiil, Danish Ambassador to Zimbabwe, Dr. John Christensen, head of the UNEP Collaborating Centre on Energy and Environment, distinguished delegates, ladies and gentlemen:

I am very pleased to welcome you to Zimbabwe and particularly to Victoria Falls. Zimbabwe was president of the second conference of the parties. My ministry is the custodian of the United Nations framework convention on climate change. It is also responsible for formulating and ensuring the implementation of the country's policies on environment and natural resources management. And as the name of the ministry implies, tourism is one of its key responsibilities. Victoria Falls, your venue, is one of the biggest tourist attractions in SADC.

I read, Mr Chairman, from your ad memoir that Victoria Falls is a fitting venue because of its connectivity through such national and international hubs as Harare and Johannesburg. In fact there are more fundamental factors that make your venue even more fitting.

Victoria Falls is a world heritage site and its value derives from flows of water through a peculiar geologic formation. Climate change appears to impact quite significantly on water and this site has been experiencing a reduction in flows over the years. The second is that the Zambezi River on which the Falls are located traverses many countries including Angola, democratic republic of Congo, Botswana, Zambia, Zimbabwe and Mozambique. Already the largest hydroelectric installations in SADC are located on the Zambezi. Its basin is additionally burdened by large coal reserves on both the Zambian and Zimbabwean sides. Additionally on the Zambian side, large rural populations depend on the basin for the production of charcoal, which provides additional income, and with the increasing frequency of droughts, this becomes a much more important activity. And as we speak, it has become clear to a number of countries in the region particularly Botswana and Zimbabwe that the Zambezi represents the most reliable long term source of water for such large cities as Bulawayo. In this light, plans and discussions on how to harmonise abstraction of Zambezi water for urban population with other uses are under way but would be in vain if we fail to clearly analyse the possible effects of climate change.

I am not familiar with the analytical approaches you have adopted in your studies but it would be quite helpful for us in the region, if you added to your work, a focused assessment of such environments as the Zambezi as a system - determining for policy consideration, impacts on ecology, water supply, human settlements, energy, fisheries and tourism.

You can see ladies and gentlemen why it is my feeling that you have chosen well on the venue.

Let me turn to the subject of your meeting. I notice you will be discussing "climate change mitigation in Africa" during your stay here in Victoria Falls. The importance of this topic to Africa is indeed demonstrated by the spread of African participants. But of course it cannot follow that the continent's concerns on the subject are uniform. The sheer size of the continent and variations in its geographical and economic attributes denies such a possibility. Those

close to the seas and oceans may be more concerned with sea level rise and loss of land, natural resources and infrastructure such as that related to shipping; those with competitive economies may be concerned with the effects of climate change response options on trade, while those with difficult desert terrains may have their concerns focused on water.

It behoves me to imagine how your efforts could embrace all these diverse issues, let alone reduce them to a simple methodological approach whose results can allow for some of a common basis for policy discussion among parties. Indeed one cannot suggest that your work is intended to demonstrate any comparability of national conditions or effects of mitigation activities among different countries.

You will agree with me, though, that there will be some common parameters or measures which apply to most countries' concerns and it is these common measures that have tended to converge global interest on the subject of climate change.

My briefing is that you are concentrating on the development of methods for studying mitigation approaches in light of such national concerns.

In my view, you have chosen your focus well. Climate change will require specific technical, economic and social responses demanding concerted mechanisms for collaboration between industrialised and developing countries. Naturally this will mean some departure from the way we have done business in the past both as nations and as an international community. In your own language - the business as usual scenario can no longer apply. Each of us, those with stated commitments and those without commitments will have to chip in, in one form or another. We in the developing nations are aware that the latter will dawn on us as the reality even if we may prefer to maintain our business as usual development path.

In such a situation, what we shall insist on is that our transition to the cleaner production path be a smooth one yielding incremental benefits to out economies beyond those we would have achieved under the business-as-usual path. And herein ladies and gentlemen lies the relevance of your work particularly that relating to the development of analytical methods for climate change mitigation.

As a policy maker, I need to be properly briefed on the extent of benefits associated with the business as usual path, the risks of adopting a change in course to a mitigation path or the benefits therein. You will appreciate that for a person in my situation, decisions are real and they impact on real communities. Much as we fear that climate change may lead to shifts in the regional spread
Of agricultural production and transitions in climatic and local weather patterns, we fear quite seriously that mitigation options adopted without rigorous analysis and consultation can lead to
Serious and negative transitions in such key aggregates as national debt, welfare distribution and the structural balance of the economies which we are trying to build.

I have not seen your presentations Mr Chairman, but I would urge you, perhaps in the course of this meeting or sometime in your future programmes to endeavour to clarify the effect of our global responses to climate change on the latter three variables national debt, welfare distribution and structural balance as it relates to the full use of local resources.

You will appreciate that one is not trying to cling on the present positions for, you know as well as I do, the situation in a number of our countries in Africa is simply bad and perhaps it

can benefit from any new path that may be suggested. My request is, therefore, for you to highlight these benefits and of course the risks.

In this light, I must express the fear that such meetings of leading experts of academic prowess may force you to dwell on complex analytical tools and the testing of various theories against possible mitigation options, but as I have already indicated, for some of us with a defined constituency to serve, a discussion focusing on the socio-economic effects of mitigation options would be most beneficial.

Mr. Chairman, climate change - which is the focus of your studies, is seen by most people as the principal driver of the concept of Globalisation or at least the two are occurring at the same time
And will, therefore, have to co-exist. We look to your studies to Bring forward the critical analysis that will make planning at Production level, local community level and state level and indeed
In our own case in the region at SADC level, sufficiently "intelligent" to ensure survival in a globalised environment Whether this is driven by climate change of other factors.

In this regard, I must say to our scholars from Africa and SADC, That nothing on this subject is at all academic. Our populations are already suffering from severe and recurrent droughts and poverty in both urban and rural areas remains regrettably high. We as policy makers are looking everywhere for solutions and, in the process we meet sometimes with effective solutions and sometimes we may pursue some suggestions which turn out to be false detractions. At this point in time, we do not know whether recommendations from such works as you are discussing here today will turn out to be effective solutions or detractions. You will appreciate it, therefore, if we appear cautious, at times, in accepting some recommendations.

And on this note, you say in your own ad memoir Mr. Chairman, that you are presenting a methodological framework showing its "relevance and replicability" in the region and you will agree with me that relevance means that the methodologies have taken into account the region's key socio-economic as well as political concerns and, better still, that they will lead to the solution of some clear problems that we face. Replicability would refer to the extent to which your results can justifiably be absorbed into our day to day analysis of similar problems either over time or across the various situations facing countries of Africa.

Of course in our efforts to achieve economic development in Africa, we cannot be totally inward looking. Therefore, if I were to add my own contribution to your main objectives listed in the conference documents, I would say one of the objectives perhaps of your methodological analysis is to "enhance global benefits from national development programmes " in this case we would be seeking the best possible way of optimising the two joint objectives while analysing primarily for the national development goal.

If you want me to put that simply, I would ask for methods to show how we can answer the question "what's in it for Africa"? What mechanisms can we adopt to achieve it? And how can we minimise risk? And naturally there are many uncertainties in the global cooperation mechanisms that are being proposed under climate change.

Africa, like most other developing nations, has made the noble concession in signing the UNFCCC thereby indicating their commitment to collaborating in the global efforts to mitigate climate change. This landmark concession was signalled at Rio and ratified at various times by our respective governments.

What we have been watching rather carefully since then are the mechanisms being proposed to finance our participation in the process. Various approaches have been suggested including the concept of incremental cost compensation, joint implementation and of late the clean development mechanism or CDM as it has been abbreviated.

None of these mechanisms has been developed to the fullest although support for African participation is being experienced through global financing facilities and bilateral arrangements. Because participating in climate change mitigation will demand significant human and financial and economic resources whose costs may be mitigated by some of the financing mechanisms, it must be expected that these mechanisms and the extent that they can mitigate these costs represent some of the major assumptions that you would have to make.

Your deliberations, I am sure, will make indications as to how Africa should treat the proposed financing mechanisms.

My early views on these are quite simple and these have been discussed significantly in Zimbabwe at various regional fora. The agreed incremental cost concept is complex and the assessment of incremental cost remains methodologically indeterminate; joint implementation is clearly a sensitive proposition because we feel in this region that it will be difficult to control and manage. However if there are clear business and social benefits directly associated with it, it can be positively implemented. The clean development mechanism appears to be a reasonable saddle between the two earlier approaches. But it too is still to be developed.

Still on that subject I cannot help make an additional observation. Namely, that there is so much transition between approaches and if we do not settle on any specific approach soon, for us, planning for the new global environment becomes quite difficult. Yet, naturally, we cannot ignore that this is the new planning environment.

So, you will agree with me that, Africa, this is no academia. Problems are real and suggested solutions should be equally realistic.

I am assured, judging from the focus of your programme, that if your methodologies may not succeed in yielding effective solutions, at least this meeting will succeed in asking the right questions for serious consideration in your next round of intellectual exchange or some other fora.

And before I conclude Mr. Chairman, you may be interested to know that Zimbabwe, your host, has just concluded its national communication, copies of which some, of you may have already seen. This is the second national communication from Africa, the first having been produced for Senegal. I am sure your colleagues from Senegal here will concur with me that writing the national communication in our uncertain planning environment is no easy task. At first it may look like just another narrative of greenhouse gas emissions inventories with statements of policy measures. Southern centre and our climate change office will be briefing you on the process we adopted in Zimbabwe and some of the challenges we have faced in producing the document.

My comment for now will be on a slightly different note. This has to do with the relationship Zimbabwe has had with Denmark on the subject of climate change. It has lead to the

production of the national communication which was produced under the auspices of global environment facility thorough UNEP.

In 1991 - 92 the first emissions inventory and abatement costing study was conducted for Zimbabwe by the UNEP collaborating centre on energy and environment in collaboration with a local research institution, southern centre for energy and environment. Since then, Zimbabwe has participated in practically all phases of mitigation analysis methodology development activities conducted by the UNEP collaborating centre on energy and environment. Results of these studies constitute a major contribution to the material content of our national communication. This only came out of the printers this week - some seven years after the beginning of our formal studies on mitigation and inventories. In between various studies had to be completed in such areas as vulnerability and adaptation particularly in the water sector agriculture and energy. Regional and national discussions on activities implemented jointly were also held along side briefings and consultations with industry - yet still, it is difficult for us to conclude that our national communication covers all aspects of development that concern the full breath of our national stakeholders.

Our relationship with the UNEP centre since the time I was minister of transport and energy (a sector which I am aware will host most of the mitigation options) and now when I am directly responsible for the convention, have been quite productive.

Ladies and gentlemen I cannot resist, having taken so much of your time already to mention that we have among us today, his excellency, Erik Fiil, who is now the Danish ambassador to Zimbabwe. This is a marvellous coincidence. For I am told that Ambassador Fiil was involved in developing the concept of the UNEP Collaborating Centre on Energy and Environment when he was located in Nairobi some time back. He was also on the board of governors of the centre before coming to Zimbabwe.

Kindly note therefore, that not all of us are strangers among you. Naturally Ambassador Fiil's presence here will enrich your discussions but more importantly for Africa and Zimbabwe in particular, enrich his perspective on significance of the institutional collaboration that quite clearly has been realised among your institutions on the subject of climate change.

The Danish international development agency, Danida, has financed quite a number of country studies on which some of you are now reporting. Mr Fiil's office in Zimbabwe is a significant contributor to our development efforts and quite naturally he will take interest in some of your recommendations as much as I will.

For now, it remains for me to wish you well while here at Victoria Falls a world heritage site and fitting venue for discussing issues of world significance. Allow me, Mr. Chairman, at this point to declare this conference officially open.

Thank you.

Danish Assistance to Climate Change Activities: H.E. Mr. Erik Fiil, Danish Ambassador to Zimbabwe

Royal Danish Embassy, Harare, Zimbabwe

Mr. Chairman, Honourable Ministers, invited lecturers, conference participants, ladies and gentlemen, friends,

It is a particular honour and pleasure for me personally to be present here today at the official opening of the Conference on "Climate Change Mitigation in Africa", sponsored by UNEP/GEF and Danida.

The reason is quite simple. It has so happened that I have almost grown up together with the UNEP/Danida Collaborating Centre on Energy and Environment at Risø in Denmark. The Centre as you know is behind the UNEP/GEF project which has brought us together here at Vic Falls today and tomorrow.

First, while serving as Danish Ambassador to Kenya and Permanent Representative to UNEP I had the opportunity to support the preparation of the project leading to the Centre at Risø. The project, as some of you may know, was prepared by my good friend John Christensen, then seconded to UNEP by my Government, and now Head of the Centre.

Then, a few years later I was posted back to Denmark and to a position in Danida, which brought me back to the Risø Centre - this time as the Danida Representative on the Steering Committee for the Centre, a post I had for about four years. During that period we had the evaluation of the first phase of the lifespan of the Centre - carried out by professor Davidson, who is also present here and will address us later this morning.

Based on professor Davidson's evaluation and suggestions the Centre was restructured a bit and we secured a permanent funding model, based on contributions from the Danish Government, UNEP and from Risø National Laboratories, which is host to the Collaborating Centre, and which gives the centre shelter in a most stimulating and professional environment.

And - here I am, now as official Danish representative to the host country for this very important conference.

You will appreciate that it is a thrill for me to address you on the subject of "Danish Assistance to Climate Change Activities" and subsequently to participate in the conference as an observer for my Government.

Mr. Chairman, let me start with a few remarks on the general situation with regard to the link between climate change, or rather Climate Change Mitigation, and Development Cooperation.

The progress in the field of promoting sustainable development since the Rio Conference UNCED in 1992 has not been overwhelming. Furthermore, larger industrialized countries made disappointing statements regarding Official Development Assistance at the follow-up at UNGASS in 1997. The fact that Denmark and a few other small donor countries are complying with current ODA goals cannot outweigh the disappointing performance of others. If we are to successfully address the issues regarding sustainable development and climate change, this trend must be reversed.

But the international discussions on climate change issues continue.

It is not least important that an increasing number of developing countries currently participate actively in the discussions of key questions such as

- what can be done to better integrate the objective of abating greenhouse gas emissions with key development objectives such as poverty reduction and sustainable social and economic development?

- how can it be ensured that the Clean Development Mechanism becomes well coordinated with the relevant existing policies governing Official Development Assistance (ODA)?

These discussions are of great importance at a time when the international negotiations on climate change are advancing rapidly.

Private sector investment is becoming an increasingly important source of finance for technology transfer to developing countries. However, ODA can still play an important role when it comes to developing new and alternative energy sources such as biomass, wind, water and solar power for the poorest target groups. It is important that we strike the right balance in the coming years between private and official transfers.

The Clean Development Mechanism was developed at the Kyoto conference last autumn. Credible and transparent criteria and guidelines must be developed for this mechanism. Furthermore, it is important that the activities of the CDM are in accordance with the overall development objectives and sector priorities of the host country. Special consideration must be given to women in development and indigenous peoples. Both these groups have considerable and valuable contributions to make in this context.

In order for developing countries to become equal partners to the CDM, there is a need to support the development of national climate policies and strategies. Furthermore, it must be ensured that sufficient capacity for monitoring projects is available.

Mr. Chairman, I am not going into any details regarding the present state of affairs of the Climate Convention, neither the political situation nor the scientific/technical situation. Nor will I comment on the Kyoto agreements or the debate, worldwide, which we have witnessed since the Conference of the Parties in Japan six months ago - although my Government holds very strong views in this respect!

Let me instead concentrate on the role of the Centre at Risø and the concrete background for all us being gathered here for this conference. I think this will enhance our understanding of what we are supposed - expected - to do here today and tomorrow.

The UNEP Collaborating Centre on Energy and Environment was established in 1991. A primary aid of the Centre is to assist developing countries in enhancing their capacity to take into account environmental issues in their sectoral policy and planning regarding energy. Through the past seven years the Centre has indeed collaborated closely to these ends with government institutions and research organisations in many countries in the developing countries of Asia and Latin America as well as Africa.

One of the UNEP Centre's first major activities was the UNEP Greenhouse Gas Abatement Costing Studies. This activity, initiated and well under way before the Rio Earth Summit in 1992, went a long way to establishing the methodology that is now used for analysing the potential and cost of measures to mitigate climate change. In that first series of 10 country studies Danida supported the study of Zimbabwe, ably carried out as a collaboration between the Southern Centre in Harare, the Zimbabwe Department of Energy and at UNEP Centre.

The Southern Centre has indeed continued to collaborate with the UNEP Centre in Risø, mainly through Danida funding. Therefore, we are also grateful indeed to Dr. Maya and his staff that the Southern Centre could be co-organisers of this conference.

This present conference marks the closing stage of a subsequent international project, financed by the Global Environment Facility through UNEP, and again coordinated by the UNEP Centre: "Economics of Greenhouse Gas Limitations". That project comprises methodological development, eight country studies in Africa, Asia, Latin America and Eastern Europe, and two studies at regional level. Through additional funding from Danida's Secretariat for Environment and Sustainable Development the Danida grant was able to support three additional country studies - in Botswana, Tanzania and Zambia - which run parallel to the UNEP/GEF project. Moreover, Danida-funded studies in Peru, and UNDP activities in Egypt and Jordan further increased the group, so that in all 14 country studies have run in parallel.

These climate change mitigation studies aim to enhance the capabilities of re-searchers and planners in the individual country to analyse the alternative possibilities for pursuing a sustainable development path, and to present their qualified and documented findings to policy makers as a basis for decisions. The studies moreover enhance the capacity of participating countries to fulfil their reporting obligations as parties to the UN Framework Convention on Climate Change, as well as strengthening their ability to take part in the associated discussions and negotiations.

What makes this series of studies, and their forerunner the UNEP GHG Abatement Costing Studies, unique, is the close collaboration and cross-fertilization of ideas. All 14 country teams have met at project workshops three times within the two year project period, first in Denmark, last year in Mauritius (kindly hosted by the Government of Mauritius) and finally last month in Denmark once more. These workshops have, I believe, been instrumental to promoting a spirit of cooperation between the teams from the different countries and regions. The close interplay between methodological development and the practical analysis of mitigation possibilities has enriched the experience of all participants.

The complete activity constitutes a major contribution to the scientific framework associated with the Climate Convention. It is a particular advantage that all the work could be carried out in the context of a centrally coordinated international effort which has had the triple goal of methodological development, capacity building and production of a country mitigation report.

The three Danida supported country teams: Botswana led by Dr. Peter Zhou, Tanzania led by Professor Mark Mwandosya, and Zambia led by Professor Francis Yamba - not to forget the Southern Centre team led by Dr. Maya who supplied back-up support - have worked hard for two years. They have collected and processed data, constructed scenarios, written reports and attended workshops. (Braving the cold of Denmark where even in the month of April they have experienced a blizzard, I am told - I was happily down here in the more pleasant climate

of Zimbabwe)! This long process itself, just as much as the final product of a country report constitutes, in my view, real capacity building in the individual participating countries.

In presenting the results of the past two years' efforts in methodological development and practical application, I sincerely hope that this conference will succeed in catalysing a similar atmosphere of cooperation.

One of the main sectors to be covered in all the mitigation studies is the energy sector, because of its importance as a major source of greenhouse gas emissions.

And we recognise at the same time energy to be a prerequisite for development.

Therefore, with the increasing awareness of the environmental impacts of energy production and use, both locally and globally, the need for highly qualified local experts and institutions is essential. I do hope that this conference will prove that such capacity exists in the participating countries.

With these few remarks I wish the organizers and all participants a most successful conference and a pleasant stay in this part of Zimbabwe, where the might - the energy - of nature is so ever present just outside our door.

Thank you.

Report on the morning session, Monday 18 May 1998

Rapporteur: Terence Coopoosamy, SBS/Ministry of Industry, Seychelles

After the official opening ceremony, which was chaired by Dr. John M. Christensen, the session was chaired by Dr. George Manful. The four speakers introduced the participants to the main topics to be discussed at the conference:

1. Introduction to the UNEP/GEF Project and Related Studies, by Dr. Gordon A. Mackenzie
2. The Climate Convention and Kyoto Agreements: Opportunities for Africa, by Prof. Ogunlade R. Davidson.
3. Financial Mechanisms, Joint Implementation, Clean Development Mechanism, by Dr. Youba Sokona.
4. Climate Change Activities and National Development, by Dr. R.S. Maya.

Introduction to the UNEP/GEF project and related studies, by Dr. G. A. Mackenzie.

The presentation introduced the participants to the UNEP/GEF project and the related studies. The Climate Change issues and implications for African countries were reviewed. It was pointed out that Climate Change Mitigation has as its main objective the reduction of GHG emissions and enhancement of sinks.

Developing countries should have an interest in climate change mitigation because of the benefits that is associated with the reduction of CO_2 and also it is compatible with the economic development of the country.

The development and application of a methodology for climate change mitigation were elaborated and the following points were made:

- Studies on energy and CO_2 emission reductions;
- Difficulties in directly comparing country results;
- The need to make assumptions clear and transparent;
- The importance of development of the baseline scenarios.

A common approach has been developed for mitigation analysis and the most important part of this approach is the analysis part.

The results of the UNEP CO_2 abatement studies were briefly presented, using mitigation cost curves from the country studies. The form of the mitigation cost curves is similar for most countries.

The UNEP/GEF project "Economic of GHG Limitations", started in 1996 being completed in 1998 aims at refine the methodology and to undertaking 8 country studies and two regional studies. In addition a number of other country studies, including three in Africa, are running parallel to and coordinated with the UNEP/GEF project.

The aims of the Victoria Falls Conference were further elaborated and the conference programme was reviewed.

The Climate Convention and Kyoto Agreements: Opportunities for Africa, by Prof. Ogunlade R. Davidson

The purpose of this presentation was to inform the participants of the main provisions of the Climate Convention, the Kyoto Protocol, and the opportunities that exist for Africa countries.

Africa faces the enormous task of addressing its environmental challenges, such as, land degradation, protection and use of forest, biodiversity management, urban and marine pollution, water right, climate instability, etc.

Though Africa is a minor contributor to GHG emissions, it is extremely vulnerable and therefore African countries should be actively involved in climate change mitigation. The global climate linkages were reviewed and specific comments were made on the present GHG concentration, geophysical impact, damages and consequences, response options, implementing mechanisms, and the Kyoto protocol.

The key provisions of the FCCC were presented and explained. It was pointed out that 44 of the 53 African states have ratified the Climate Convention. The majority of the states have undertaken GHG inventories, mitigation assessment, vulnerability assessment, etc.

The Kyoto protocol has been adopted by 161 countries. The Annex I countries have agreed to cut down GHG emissions by an average of 5.2% by 2010 below the 1990 levels. There are six more gases that have been included in the protocol and there are no targets for non-Annex I countries.

The Kyoto protocol address critical issues that are of major concern for developing countries. The direct issues are the future reduction targets and clean development. The indirect issues are sinks, emission trading, and how policies and measure adopted by Annex I countries could affect African countries.

Article 12 of the protocol address the issue of the Clean Development Mechanism (CDM). The 4th COP to be held in 1998 and it is expected that the protocol will come into force in 1999. After 2005, there will be assessment to verify if there has been reduction in GHG emissions.

It was pointed out that very few African countries are presently involved in the Joint Implementation (JI) and Activities Implemented Jointly (AIJ). There are various opportunities for involvement in such programme and African concerns can be addressed through such participation.

The project components of the CDM were elaborated. The CDM must be compatible with national development objectives and the environmental needs. The correct baseline must be assigned and the GHG reduction options must be real and practical. The possible benefits of CDM are increase in the flow of investment, stimulate technical co-operation, improve business, etc. The problems associated with the implementation of CDM were highlighted. The similarities and differences between AIJ and CDM were reviewed, but there exist many differences between the two.

The CDM and AIJ programmes can be beneficial for African countries, but the countries must be prepared to contribute to the implementation of these programmes. It was pointed out that there is a need for:

- Strong legal framework;
- Established business environment;
- Organised project information base;
- Organised and co-ordinated institutional framework.

Subsequent discussions addressed the following issues:

1. How will credit by the year 2000 be banked? African countries must meet and decide on this issue, and also sort out the issues related to the Issue of Certificate, Market Mechanism, etc. African countries have an opportunity to decide on institutional arrangements.

2. How will vulnerability and adaptation programmes be funded? Very few countries are coming forward to fund vulnerability and adaptation options, though this has been established in the Kyoto protocol.

3. What is the role of the private sector? In developing countries, private sector participation is complex and needs to be properly studied. It is an issue to be addressed by this conference.

Financial Mechanisms, Joint Implementation and Clean Development Mechanism, by Dr. Youba Sokona.

The presentation reviewed the financial mechanisms of CDM, AIJ/Joint Implementation and GEF, and assessed the prospects for Africa. It was pointed out that Africa needs to take a more proactive role on these issues.

Climate change is having its effect on the global economy, and it is a key issue for the planning and policy process. Africa is highly vulnerable to climate change and therefore there is a need for an integrated approach to tackle climate change issues. The process of climate change demands a certain degree of solidarity on the part of all African countries.

Technology transfer and capacity building are key issues to be addressed. There is a need for the creation and maintenance of strong institutions and linkages within the African countries. There is a lack of strategic vision on the benefit of addressing climate change issues. In Africa the markets are weak and so is the political structure needed to tackle issues of climate change.

A comparison of issues related to the debate on emission reduction and sustainable development were made. The position of the industrial countries and that of the developing countries on the issues were presented.

The CDM evolved from the proposed "Clean Development Fund", with an aim of addressing a number of different objectives simultaneously. However, the CDM has not yet been defined in any detail

Questions of equity should be implicitly recognised in the definition of the CDM.

African countries must decide whether the CDM is to be a mechanism for financial assistance and technology transfer.

It was pointed that presently Africa is experiencing a process of growth, a decline in overseas development aid and direct foreign investment.

It was pointed out that CDM must be regarded as separate from AIJ. With regard to GEF, Africa must fight to maintain the present objectives of the GEF. It would be beneficial if the GEF could review the past studies undertaken by various African countries.

There should be the creation of an enabling environment for the implementation of climate change options.

The AIJ are usually in the form of bilateral arrangements, usually with private sector participation. The emphasis is on emission reduction and there seems to exist limited opportunities in Africa for AIJ. The CDM though not defined yet, is meant to complement the programmes of GEF and AIJ/IJ.

There are three apparent roles for the CDM:

- a certification body;
- a clearing house;
- a project co-ordinating body.

The criteria to be used for the choice of projects and programmes for CDM should be as follows:

- Emphasis on basic energy related infrastructures;
- Regional and sub-regional co-operation in transport, energy, housing, etc.
- Basic infrastructure for development.

Following the presentation, the floor was opened for question.

What are the funding possibilities for the implementation of climate change mitigation projects? The Climate Convention address climate issues only and not development issues, that is why African countries need to adopt a pro-active role in order to secure the funding required to implement its climate change programmes. There is a need to define the CDM and to have a strong argument for this definition.

Climate Change Activities and National Development, by Dr. R. S. Maya.

The presentation addressed the issues:

- how climate change activities relates to the national development process
- the influence of the climate change process in African countries
- how to maximise benefits from the existing implementation mechanisms, i.e., to understand and to know that these mechanisms exist.

As a result of the present economic development, Africa is experiencing an exponential growth in energy consumption, and as a result, there will be an increase in the GHG emissions. Measures must be undertaken to limit the GHG emissions. At the same time, African countries should not be penalised for this increase in GHG emission which is associated with economic development.

The key characteristics of the rural African energy system were reviewed and elaborated upon. Certain features, such as, low level of energy demand and the strong potential for renewable energy technology is apparent. The energy issue contributes significantly to the development problems in Africa. There is now a new opportunity for Africa to address energy issues.

African countries now have the opportunity to re-visit their development strategies, and there is a need to re-link environment and development policy. The African countries have been actively participating in the global efforts to reduce GHG emissions, especially through the use of renewable energy technology in the rural areas.
The following recommendations were made:

1. To develop African strategies on technological co-operation and innovation.
2. To strengthen regional institutions and increase financial support.
3. To stimulate North-South and South-South collaboration.

Plenary discussions

Following the presentations, Prof. Davidson, Dr. Maya and Dr. Sokona formed a panel to take questions from the floor and continue the debate on the topics they have presented. The main conclusions of the discussions were:

1. Renewable energy technology has a role in rural Africa, but the issue is to tackle the financial mechanism methodologies and procedures.

2. CDM has not been established, but has been proposed. One of the aims of this conference is to shape the CDM. It is to be noted that AIJ concentrates on the reduction of GHG emissions. Again reference was made to Article 12 of the protocol. It was pointed out that there are now requirements to show clean development path to develop national resources. There could be co-operation between developing and developed countries to implement clean development. There will be a flow of money in CDM and it will have a business approach.

3. There is a lack of NGO participation in the climate change debate in Africa. The experts in the NGOs are not being consulted or utilised by the policy makers. There is also a lack of involvement of the sub-regional and regional organisations in the climate change debate.

4. There is a need to develop strategies for our negotiators who attend meetings on climate change issues.

5. Policy relevant questions need to be develop and this meeting should make it happen. The meeting should also address the issue of banking of credits in Africa and how to organise the credit system.

Introduction to the UNEP/GEF Project and Related Studies

Gordon A. Mackenzie, UNEP Collaborating Centre on Energy and Environment, Risø National Laboratory, Denmark

1 Background

The limitation of greenhouse gas (GHG) emissions is a complex issue, intimately connected with economic development at local, national, regional and global levels. Key economic sectors such as energy, agriculture, industry and forestry all produce GHGs, and are likely to be affected directly and indirectly by any mitigation policy. The UNEP Greenhouse Gas Abatement Costing Studies, initiated in 1991 (UCCEE 1992) and coordinated by UCCEE, attempted to address these complex issues, developing a methodological framework and testing it through practical application in ten countries. The results of Phase Two were published in 1994 (UCCEE 1994a, b and c, and Halsnæs et al. 1994) and a third phase, extending the approach to other gases and sectors, and applying it in two countries, was completed at the end of 1995.

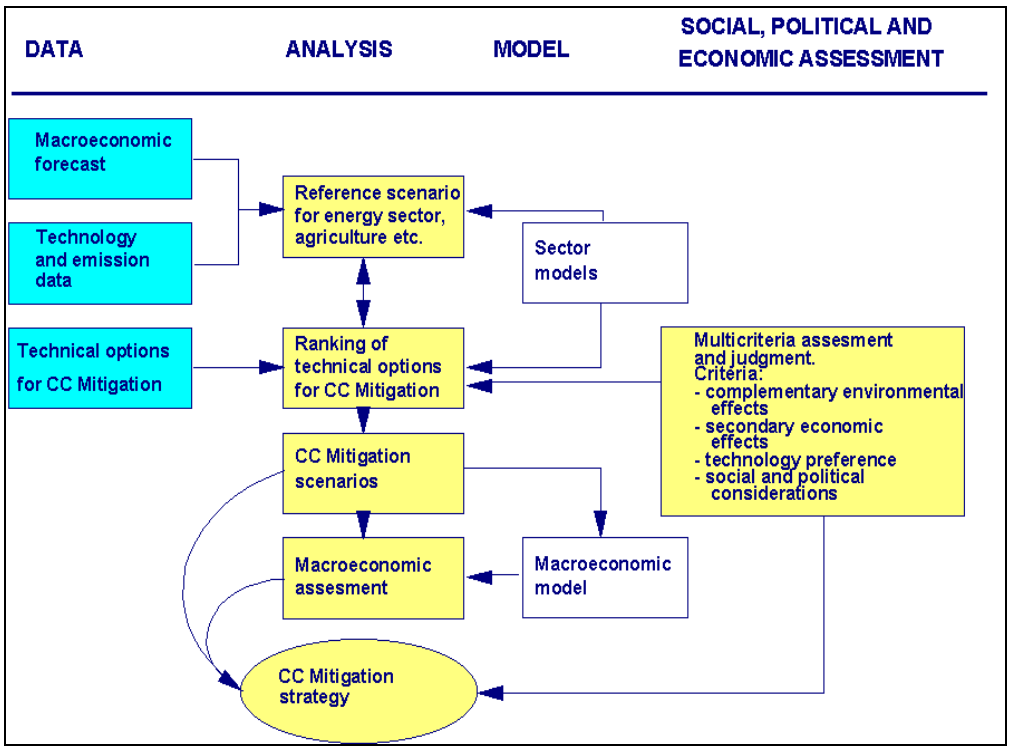


Figure 1 The approach to climate change mitigation analysis developed in the UNEP projects.

2 Common methodological approach to country studies

A particular characteristic of the UNEP approach to mitigation analysis has been the emphasis on the importance of assumptions and scenario definition. In particular the definition of the baseline scenario is of crucial importance for the results of the mitigation costing calculation. The approach is illustrated in Figure 1.

National climate change mitigation studies vary in coverage, details and sophistication of assessment efforts involved. This is a consequence of different national institutional capacities, analytical tools and statistics. Some countries have participated in other similar

study activities and can utilise already implemented models, while others have few experiences in climate change assessment.

The methodological approach is purposely defined broadly to enable national analysis to be carried out with different focus and depth. However, all countries are encouraged to follow a common analytical structure. The common elements in this analytical structure are summarised below:

(i) Comprehensive evaluation of national social and economic development framework for climate change mitigation.

- Comprehensive description of national framework for CC mitigation including: base year statistics on GDP structure, social conditions, energy balance, aggregate GHG inventory, major land use activities, population.
- Evaluation of main national economic and social national development trends and the GHG emissions that are expected to occur as a result of economic development.
- Overview of other climate change studies including impact-, adaptation-, inventory and mitigation studies.

(ii) Baseline scenario projection

- 10-15 year baseline scenario projection for CO_2 emissions from energy consumption and land use activities.
- 30-40 year baseline evaluation of main development trends.

(iii) Mitigation scenario(s) projection(s)

- Identification of mitigation options related to the most important future sources and sinks sectors.
- Screening of mitigation options
- Assessment of reduction potential and cost of mitigation scenarios.
- Integration of GHG reductions and costs across measures and sectors, through construction of GHG mitigation marginal cost curves.

(iv) Macroeconomic assessment

- Qualitative description of main macroeconomic impacts of national climate change mitigation strategies.
- Assessment of key macroeconomic parameters.

(v) Implementation issues

- Identification of main implementation requirements including financial support, technologies, institutional capacity building, regulation policies and further improvements of the national decision framework.

While one of the aims of the original set of country studies (UNEP 1992) was to achieve comparability between analyses of different countries, this has proved to be a complex issue (Halsnæs et al.1994). Nevertheless, the common methodology, transparency of assumptions and agreed price concepts do allow some degree of comparison between countries. Figure 2 presents some of the main quantitative results of the UNEP GHG Abatement Costing Studies in the form of CO_2 reduction cost curves for 9 of the participating countries.

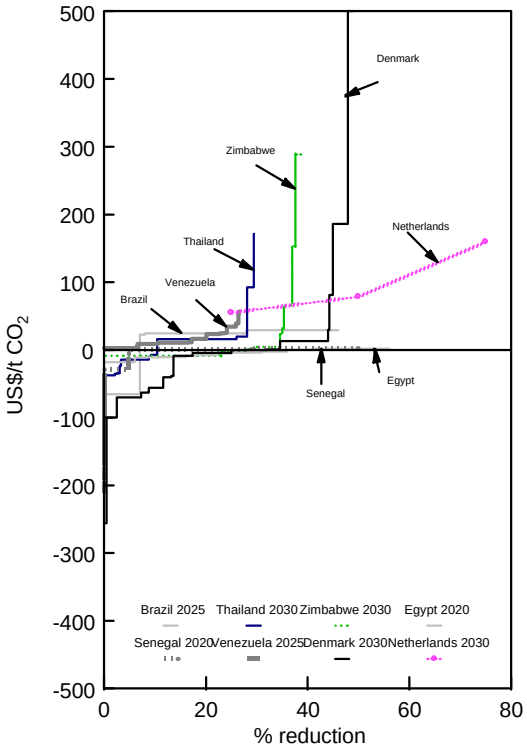


Figure 2 CO_2 reduction cost curves for 9 countries from the UNEP GHG Abatement Costing Studies (UCCEE 1994a)

3 Economics of GHG Limitations

In 1996 the UNEP Centre launched a project entitled "Economics of GHG Limitations" comprising eight national and two regional studies in parallel with a methodological development programme. The project is financed by the Global Environment Facility (GEF) through UNEP, and the UNEP Centre is responsible for coordination of the individual studies as well as development of the methodological framework, working in close collaboration with Lawrence Berkeley National Laboratory (LBNL).

The national and regional studies are carried out by centres and government agencies in the participating countries and regions. Participating countries are Argentina, Ecuador, Estonia, Hungary, Indonesia, Mauritius, Senegal and Vietnam. The two sub-regional studies focus on the SADC (Southern African Development Community) countries in southern Africa and the Andean Group countries in South America. The participating countries were chosen, from among a number of national requests, to represent the three primary developing regions (Africa, Latin America and Asia) as well as Eastern Europe. Of these countries several have already embarked on or completed mitigation studies, while others have yet to gain experience in the procedure.

In parallel with this UNEP/GEF project a number of other country studies have been initiated. These comprise Botswana, Tanzania and Zambia in Southern Africa (financed by Danida), Peru (also financed by Danida) and Egypt and Jordan (financed by GEF through UNDP).

The fourteen countries represent a wide mix of systems with respect to energy and other sectors, and in terms of level of development, rural/urban mix, availability of natural resources, etc. This diversity facilitates the broad development of methodological guidelines to treat a variety of circumstances and settings. In particular, the broadening of the analysis from simply energy, as in the early phases of mitigation studies, to treat forestry, land-use and agriculture introduces significant challenges.

The Methodological Guidelines followed by the country teams are generally an extension of those developed in the UNEP GHG Abatement Costing Study (UCCEE 1994c). These have been enhanced and extended with respect to forestry and land-use mitigation options, macroeconomic assessment and multi-criteria assessment. The Guidelines document is supplemented by handbook material on special topics. This methodological development activity is being carried out by staff at the UNEP Centre and LBNL in parallel with the country study execution, and results are presented at methodological workshops attended by representatives of all country teams.

4 Climate Change Mitigation Studies in Africa

The African countries involved directly in the mitigation studies comprise Botswana, Egypt, Mauritius, Senegal, Tanzania and Zambia as well as the regional study of southern Africa. Egypt and Zimbabwe were involved in the earlier UNEP GHG Abatement Costing Studies. The experience gained through those earlier studies is now being enhanced and expanded in Egypt through participation in a study parallel to the UNEP/GEF “Economics of GHG Limitations” project, but funded through UNDP/GEF, and in Zimbabwe through the UNDP/GEF Capacity Building project. We will hear more of these studies in the next few days.

With regard to Botswana, Tanzania and Zambia, these countries have been the subject of study in the Danida-funded project “Climate Change Mitigation in Southern Africa”, already referred to by Ambassador Fiil in his address. The first phase of that project was published in 1995 (UCCEE 1995), while the second phase has been carried out in parallel to the UNEP/GEF project. The results of these three studies will be presented by the team leaders at this meeting.
Finally Senegal, which was also represented in the earlier set of studies, is included in the UNEP/GEF project which is taking the analysis further than was possible in the earlier project, and with an accent on capacity building within the Senegalese national institutions.

5 Regional Cooperation for Climate Change Mitigation

Internationally coordinated action by developing countries could help to mitigate global climate change in ways that are environmentally, economically and socially beneficial. As part of the UNEP/GEF project '”The Economics of Greenhouse Gas Limitations”, the UNEP Centre, in collaboration with other centres, has carried out studies in two sub-regions: southern Africa (essentially the SADC area) and the Andean Group of countries in South America.

An important characteristic of the southern African region with regard to energy resources is the existence of coal in the southern part (predominantly South Africa and Zimbabwe) and vast hydropower potential in the north (Zambia and Zaire). One of the most obvious areas for cooperation within SADC, directly linked to climate change mitigation, is the regional pooling of electricity capacity with a view to minimising CO_2 emissions.

Power trading is already taking place within the Southern African Power Pool and power is being exchanged between the utilities of the region on a daily basis. The motivation behind SAPP, however, is not to minimise CO_2 emissions. The power pool is fully justifiable in terms of security of supply and economic considerations. The addition of CO_2 emission minimisation would provide a further argument for such cooperation, and its possible extension.

The potential barriers against international cooperation aimed at CO_2 reduction are nevertheless daunting. National interests, particularly with regard to security of supply, remain of paramount importance to the actors involved. The technical complexity of large generating capacity separated by long distances also presents problems with regard to system stability. However, the potential environmental gains to be achieved, both locally and globally, are considerable so that there may be large incentives to overcome both the political and technical difficulties.

Regional cooperation for climate change mitigation has received little attention so far, and the national and regional actors within SADC have not been fully sensitised to the possibilities and opportunities. The present activity, along with the parallel study in the Andean Group, will hopefully contribute to this sensitisation process. The results of the southern African study will be published later this year in book form (Rowlands 1998).

6 References

Halsnæs, K.; Mackenzie. G.A.; Swisher, J.N.; Villavicencio, A., Comparable assessment of national GHG abatement costs. Energy Policy (1994) v. 22 p. 925-934

Rowlands, I.H. (ed.) “Climate Change Cooperation in Southern Africa”, Earthscan, London, 1998 (in press).

UCCEE 1992. UNEP Greenhouse Gas Abatement Costing Studies. Analysis of abatement costing issues and preparation of a methodology to undertake national greenhouse gas abatement costing studies. Phase One Report. (UNEP Collaborating Centre on Energy and Environment. Risø National Laboratory, Roskilde, August 1992) 157 pp.

UCCEE 1994a. UNEP Greenhouse Gas Abatement Costing Studies. Analysis of abatement costing issues and preparation of a methodology to undertake national greenhouse gas abatement costing studies. Phase Two. Part 1: Main report. (UNEP Collaborating Centre on Energy and Environment. Risø National Laboratory, Roskilde, 1994) 128 pp.

UCCEE 1994b. UNEP Greenhouse Gas Abatement Costing Studies. Analysis of abatement costing issues and preparation of a methodology to undertake national greenhouse gas abatement costing studies. Phase Two. Part 2: Country summaries. (UNEP Collaborating Centre on Energy and Environment. Risø National Laboratory, Roskilde, 1994) 170 pp.

UCCEE 1994c.UNEP Greenhouse Gas Abatement Costing Studies. Analysis of abatement costing issues and preparation of a methodology to undertake national greenhouse gas abatement costing studies. Phase Two. Appendix: Guidelines. (UNEP Collaborating Centre on Energy and Environment. Risø National Laboratory, Roskilde, 1994).

UCCEE 1995. "Climate Change Mitigation in Southern Africa. Methodological Development, Regional Implementation Aspects, National Mitigation Analysis and Institutional Capacity Building in Botswana, Tanzania, Zambia and Zimbabwe. Phase 1" (UNEP Collaborating Centre on Energy and Environment, Risø National Laboratory, Denmark. August 1995).

The Climate Convention and Kyoto Agreements: Opportunities for Africa

Ogunlade R Davidson, UNEP Collaborating Centre on Energy and Environment and University of Sierra Leone

1 Introduction

The potential threat of global climate change that has mainly resulted from intense human activities since industrial revolution is very serious problem that deserves collective actions by countries worldwide, but has to be based on common but differentiated responsibilities due to historical and cumulative contribution to the problem. Realizing this threat led to the response by the United Nations system to form the Intergovernmental Panel on Climate Change (IPCC) in 1988 based on an initiative by the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP). Activities within IPCC led to the drafting of the United Nations Framework Convention on Climate Change (UNFCCC) as part of its role of providing sound scientific basis for decision-making on the climate change problem. The intense negotiations and debate that followed this draft resulted in its approval by over 150 nations at the United Nations Earth Summit (UNCED) held in Rio de Janeiro, Brazil in June 1992.

As a result of the ratification of UNFCCC by more 50 countries, the Convention came into force in March 1994 and the first Conference of Parties (COP1) was held in June 1995 in Berlin, Germany. At COP1, the Berlin mandate was established which aimed at strengthening commitments by Annex I parties to the convention, and the adoption of a Protocol by 1997. After a series of debate, consultations and negotiations, a Protocol was adopted at the third Conference of Parties (COP3) held in Kyoto, Japan December 1997. This Protocol which has come to be known as ‘’Kyoto Protocol’’ as many such international documents will need several clarifications before ratification. However, some of its provisions present non-Annex I parties of which countries of Africa are part of opportunities to satisfy their sustainable development needs while contributing towards slowing the threat of climate change. This short paper explores such opportunities for African countries. The paper briefly discusses the environmental challenges facing the continent as a background as they are strongly linked with its development aspirations and with climatic instability.

2 Environmental Challenges of Africa

Africa faces major interacting socio-economic and environmental challenges. In addition, it has gone through several natural problems along with high population growth rate, which have increased the stress of these challenges, and resulted in increased dependence on its natural resource base. As a result, environmental degradation has persisted in many places in the continent affecting agricultural production and other economic activities.

However, there is a major imbalance in the use of natural resources in the continent. Soil and vegetation are over exploited while energy; minerals and organic resources are under-utilised.

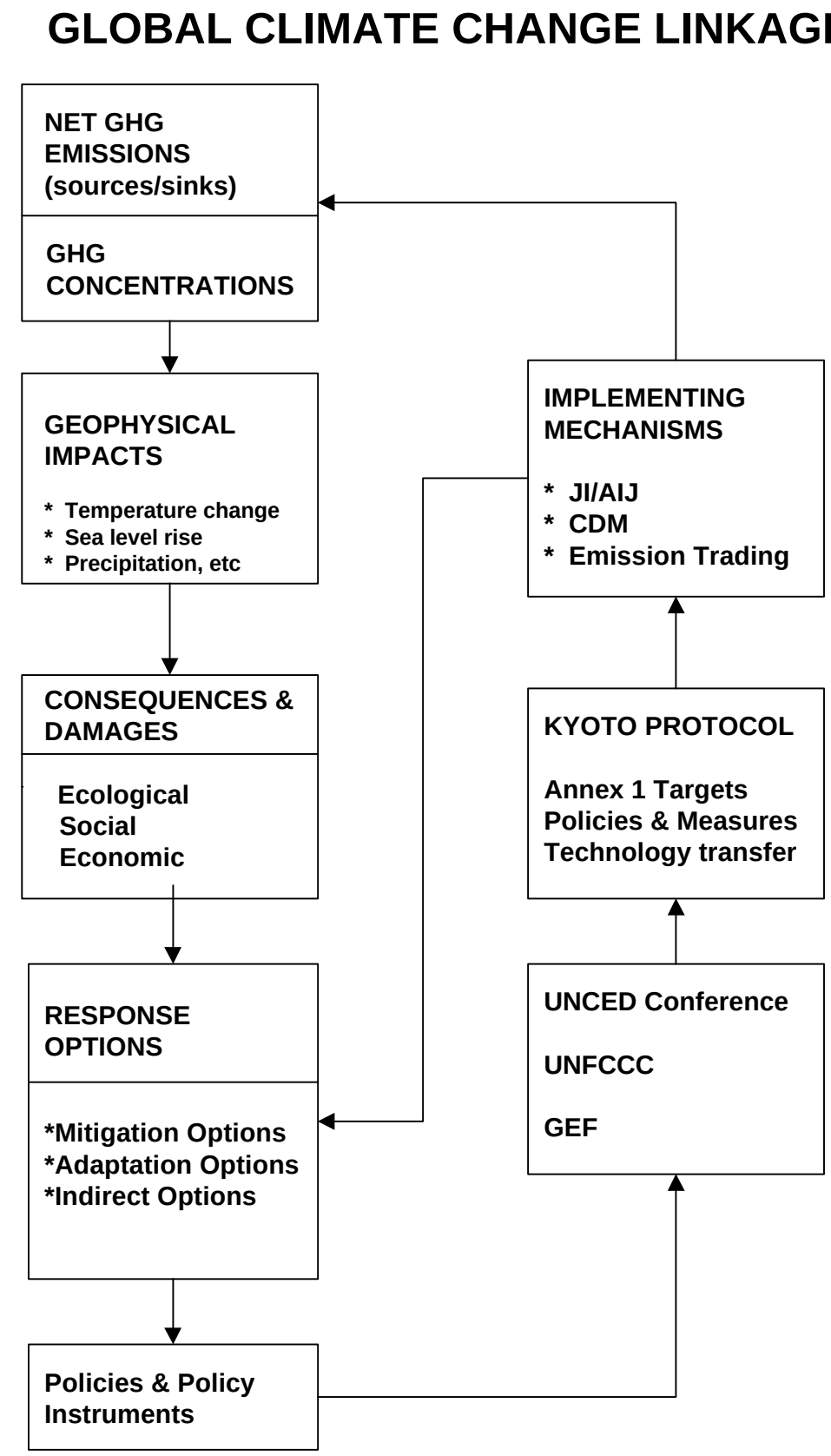


Figure 1 Global Climate Change Linkages

Hence, the major challenge for the continent is to establish a meaningful balance in the use of these resources while realising the variation in resource endowments in the continent. African governments in various meetings have identified the following as the continent's main environmental concerns (UNEP, 1997):

- Land degradation and desertification problems, especially with respect to food security
- Protection and sustainable use of forests
- Bio-diversity protection and management
- Water scarcity and efficient management
- Urban, coastal and marine pollution
- Climate variability such as drought and climate change
- Demographic changes and its effects on natural resource utilisation

All these concerns have both direct and indirectly linked to the climate change problem because of the interacting development issues relating to the different responses to this problem.

3 Global Climate Change Linkage

The global climate change problem and responses can be considered in the form of a chain of events as depicted in fig.1, starting from net greenhouse gas (GHG) emissions in the atmosphere to the response strategies and then the global debate and decisions.

The increase in the accumulation of GHG emissions mainly due to human activities since the industrial revolution will likely to have geophysical impacts on the world in the form of temperature changes, rise in the level of the sea and extreme weather events such as changes in precipitation. Some areas in the world have started experiencing these changes. These impacts can lead to serious consequences that can be ecological, social or economic. The responses to these consequences and the likely damages fall into three possible options, mitigation, adaptation and indirect actions. Mitigation options refer to actions that will reduce the amount of GHG emitted or that can absorb such gases, while adaptation options are actions that assist to cope with the likely impacts of climate change. Indirect options are actions that may not necessarily directly involved with climate change such as education but can have significant effect on climate change. Major policies and policy instruments will be required to implement these actions. The debate surrounding climate change and the possible different responses led to drafting and adoption at the United Nations Conference on Environment and Development (UNCED) with later ratification of UNFCCC. The Global Environment Facility (GEF) that is operated by the World Bank, UNEP and UNDP was established as the institution for funding developing countries with incremental cost of embarking on environmentally-sound actions. The Protocol to the Convention that emerged from the COP3 allocated binding targets for Annex I parties and calls for significant technology transfer to non-Annex I parties to assist them to achieve sustainable development. In addition, the Protocol establishes three implementing mechanisms. The first is Joint Implementation (JI) that allow parties to jointly embark on projects and programs to abate GHG emissions in article 6. The next is Emission Trading that will allow trading of emissions between Annex I parties in article 17, and the last is Clean Development Mechanism which is mainly to assist developing countries to attain their development objectives in a sustainable way in article 12. The modalities of these mechanisms are yet to be worked out and when they

become fully established and operational they are expected to have profound impact on the various response options and the net GHG emissions in the atmosphere.

4 Africa and Global Climate Change

Africa is a minor contributor of global GHG emissions. Its share of carbon emissions indicates this, which is by far the most important GHG in fig.2, only 3.2% of the world's total in 1992. Its share of methane emissions is also small, only 7.7% of the world's total in 1991 (WRI, 1996). However, according to the Intergovernmental Panel on Climate Change (IPCC), Africa is one of the most vulnerable areas to the likely impacts of climate change. Due to its current development needs, Africa can utilise mitigation measures to satisfy its developmental needs.

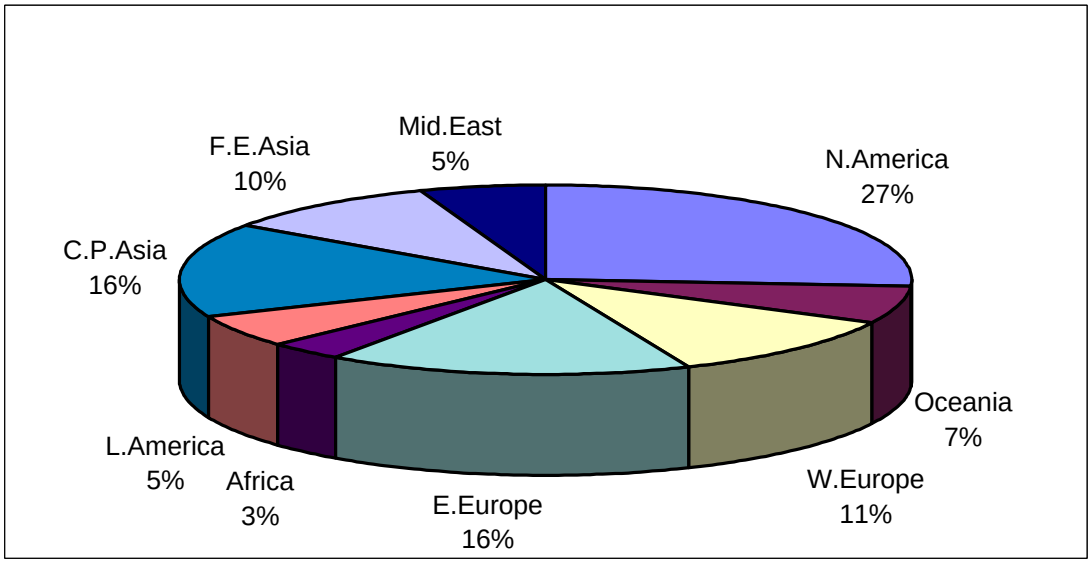
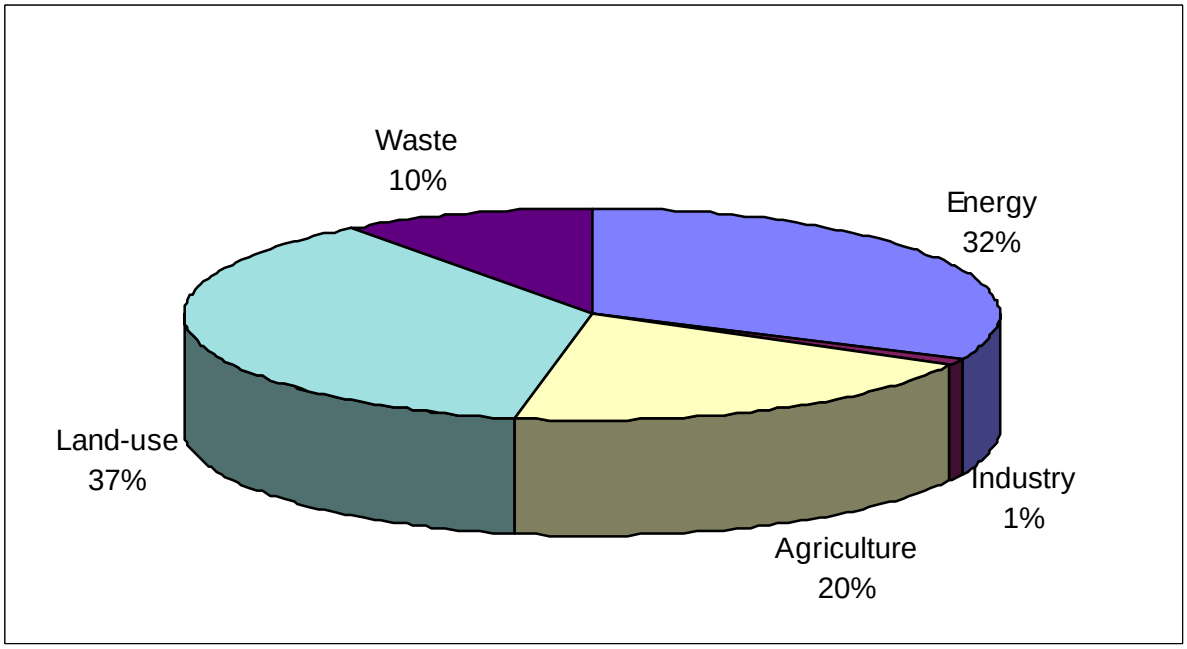


Figure 2 Regional carbon dioxide from the energy sector and cement production, 1994, total 6.2 Gt

Apart from the fact that collective actions from countries worldwide are necessary to solve the climate change problem, Africa can have significant benefits from involving in the various climate change processes. These benefits include:

- Improved understanding of their local and regional environmental problems.
- Provides the opportunity for possible linkages and integration of environmental, development and income distribution issues.
- Assist to strengthen capacities in the energy, planning and economic sectors
- Provide the opportunity for the transfer technological and financial resources.

Energy and land-use sectors dominate GHG emissions with the former accounting for 32% and the latter 37%. The relatively low industrial activity in the continent accounts for the relatively low industrial share of emissions as shown in fig.3. Agriculture contributes 20 and 10% respectively (WRI, 1996). Though GHG emissions are low in global terms, but it has been rising since 1950 as it can be seen for carbon dioxide emissions shown in fig.4. Since 1950, carbon emissions grew from about 25 to almost 180 million metric ton of carbon by 1990, and per capita emissions also increased accordingly, from 0.12 to 0.28 metric tons of carbon. Emissions from solid and liquid fuels, mostly coal and oil combustion dominates these emissions. Emissions from gas is increasing but still accounts for a very small share



(ONRL, 1992).

Figure 3 Assessment of current GHG emissions from Africa

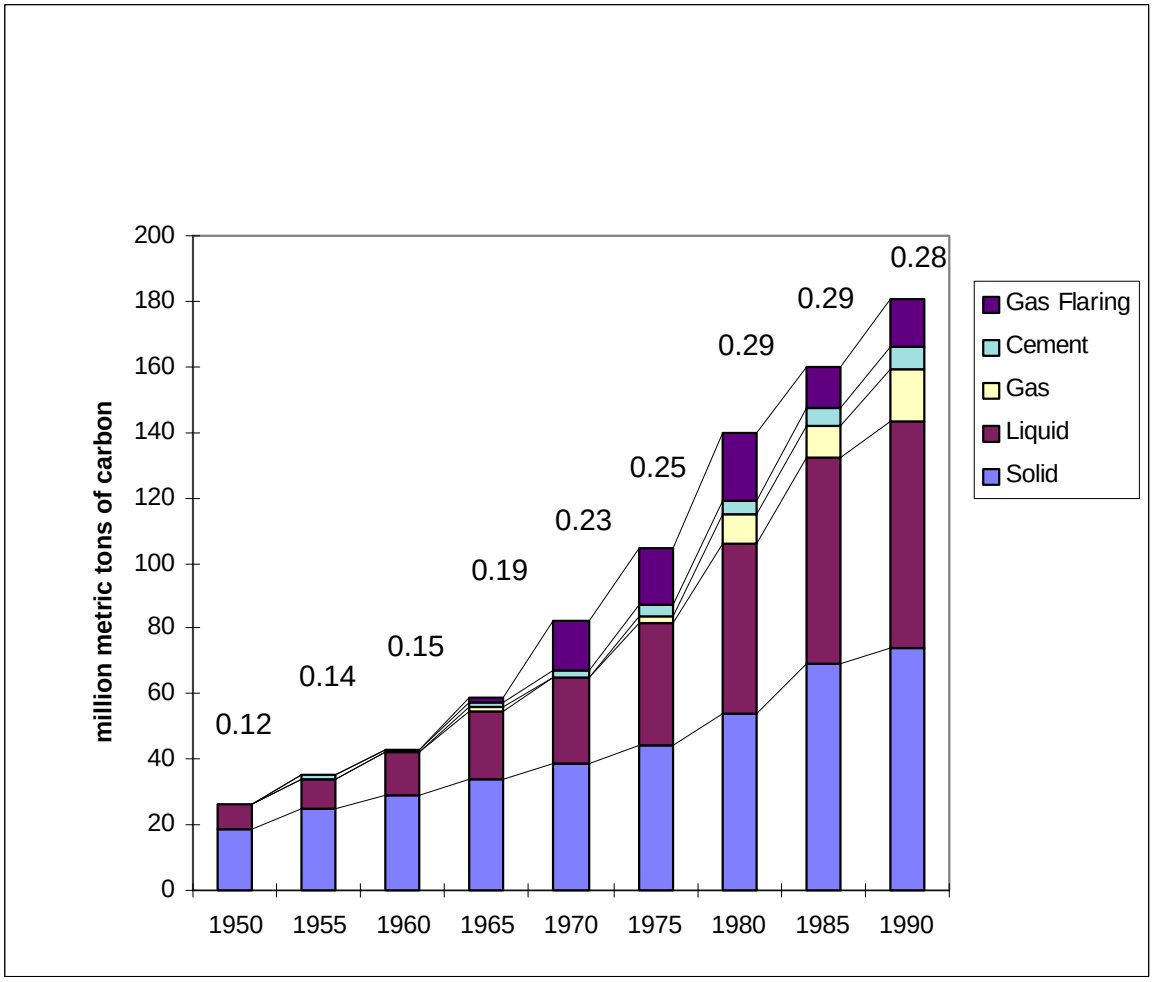


Figure 4 Carbon dioxide emissions from energy sector and cement production, 1950-1990

5 UNFCCC and Africa

The objective of the UNFCCC is to stabilise atmospheric greenhouse gas (GHG) concentrations at a level that prevents dangerous anthropogenic interference with the climate system. This should be done on the principles of intra and inter-generational equity, differentiated responsibilities, precautionary, cost-effectiveness, comprehensiveness, special needs of developing countries and the support of free trade. All parties to the convention are required to submit their national communications three years after their ratification. Non-Annex I parties are to be funded to produce their national communications, paid the incremental costs of mitigation measures and to access financial and technology transfers.

Despite the low contribution of Africa to global GHG emissions, African countries have demonstrated their interest to participate in the climate change process in many occasions. In Brazil in 1992, 38 of the 53 African countries signed the UNFCCC and 12countries ratified it before it came into force in March 1994. At present 44 African countries have ratified the convention. Also presently, majority of the countries in the continent are undertaken climate change projects that are not only contributing towards slowing down GHG emissions but contributing towards their sustainable development objectives. In addition, African participation in the global climate debate has been steadily increasing.

6 Kyoto Protocol: Critical Issues for Non-Annex I Parties

161 parties at the third Conference of Parties (COP3) adopted the Kyoto Protocol in December 1997 in Kyoto, Japan. This Protocol was the first international attempt to have legally binding obligations on Annex I parties to reduce GHG emissions by an average of 5.2% below 1990 levels by 2008-2012, though each party has individual targets. The protocol included three more gases in addition to carbon dioxide, methane and nitrous oxide that were originally in the convention. The three new gases are hydroflurocarbons, perflurocarbons and sulphur hexafluroride. The Protocol calls for demonstrable progress from Annex I parties by 2005. The Protocol opened for ratification on March 16, 1998 and is expected to enter into force 90 days after ratification, which requires at least 55 parties that account for at least 55% of carbon dioxide emissions from Annex I countries in 1990. This means that it will be difficult to ratify if the USA, Russia and Japan did not ratify it. The Protocol contains some vague wordings and unresolved issues such as the contribution of the six different gases to the different individual targets, rules and guidelines of the different implementing mechanisms that emerged from the Protocol.

Despite the Protocol being mainly an agreement between Annex I parties, it has critical issues that will relate to future activities in non-Annex I parties. Non-Annex I parties and the Clean Development Mechanism will directly relate some of these issues to them such as future commitments. The indirect issues are emissions trading impacts of Annex I policies and measures on non-Annex I parties and the evaluation of sinks.

7 Clean Development Mechanism

The Clean Development Mechanism (CDM) evolved from the Brazilian proposal to set up a Clean Development Fund from proceeds of defaulters of their commitments to the agreed targets of the UNFCCC. This idea was discussed at Kyoto and it resulted in article 12 of the Kyoto Protocol calling for the setting up a 'Clean Development Mechanism' with the purpose of assisting non-Annex I parties to achieve sustainable development. Also, it should contribute to the stabilisation of GHG concentration, and assist Annex I parties to comply with its commitments from 2000 to 2008-2012. Under this mechanism, Annex I parties may use these reductions to contribute to their compliance of the Protocol. The governance of the CDM will be by an Executive Board that will be chosen by the meeting of Parties to the Protocol (MOP), and the mechanism shall assist to fund certified non-Annex I projects. Though the precise details of this mechanism are yet to be agreed on, there are some components that are already indicated in the Protocol about likely CDM projects. These projects must be compatible with national development objectives and environmental needs and should be assigned a baseline. Further, the GHG reductions should be real, measurable, verifiable, and additional and the credits may be used as part of commitments. The modalities and procedures for CDM will be agreed on after the ratification of the protocol. The components stated above raise some key issues for developing countries that need to be addressed if they should benefit fully from CDM when implemented. These are the relationship between CDM and other financial mechanisms such as GEF, ODA and FDI, evaluation of project, program and national baselines, the design of CDM projects and the overall governance of CDM activities.

However, CDM can provide major benefits that can assist African countries to satisfy their genuine desire in achieving economic development and improved quality of life for their citizens. These include increased flow of foreign investments for capital intensive and technology demanding projects, stimulation of meaningful technology co-operation and innovation between countries of Annex I and non-Annex I parties and will stimulate African markets and the overall business environment.

8 Opportunities for Africa

The GEF has assisted African countries in climate change especially in funding and technically supporting these countries to undertake enabling activities that will lead to the formulating of their national communications. In addition, GEF has supported climate change projects such as the Solar project in Zimbabwe, and the Energy Efficiency project in Cote d'Ivoire which can contribute meaningfully to the overall development of these countries. However, African countries should intensify their efforts to have more projects because GEF funding can be used to provide very good leverage funds for larger projects with significant development benefits.

An opportunity that Africa failed to exploit was the facility for the trial phase of JI, the Activities to be Implemented Jointly (AIJ). This facility allows Annex I parties to enter into agreement with a non-Annex I party in a project that aimed at abating GHG. Developing countries in Asia and Latin America developed several on-going AIJ projects, but African countries were cautious and failed to start such projects. However, there are now signs that some of such projects will be started soon.

Involvement in both GEF and AIJ can result in significant technology transfer and capacity building depending on how the projects were designed and implemented. The responsibility for that largely depends on the negotiating and technical capacities of the African countries involved.

Two sectors that offer great promise in African countries to benefit from the UNFCCC and the Kyoto Protocol is the power and the transport sectors: This because they are the largest and second largest GHG emitters. Significant technologies have been developed in these sectors and they are the most needy in many African countries. Hence, development in these sectors using sustainable options will not reduce GHG emissions but will allow African countries to increase service provision in a more sustainable way. Further, it will help African countries to contribute more meaningfully to the global solution to climate change.

The power sector of most African countries is performing badly and as a result they fail to provide the much-needed electricity for its inhabitants. Access varies between 10-60% among these countries. Some of the problems for the poor performance are due structure and ownership (dominant role of the state, bundling of activities, limited coverage), high T&D losses (15-30%), low rate of return on assets, and ill-defined regulatory system. Recent reforms in the power sector of most developed countries have led to new initiatives both hard and soft technologies that can be transferred to developing countries through climate change initiatives. These technologies include:

- Renewable energy technologies
- Advanced Biomass-based systems
- Combined gas power systems

- Institutional reform initiatives

Presently, there is a significant gap in transport service provision between the industrialised regions and developing countries of Latin America, Asia and Africa. IN African countries, the development patterns has led to significant differences within these countries in the availability of transport services. They are concentrated in the cities, while the rural areas where significant number of their inhabitants live depend on inadequate, unreliable, high cost and poorly maintained transport system. Solving these problems, while ensuring a more sustainable future remains a major challenge. Transferring environmentally sound transport technologies from developed countries to African countries through climate change initiatives can assist to increase the provision of transport services in these countries in a more sustainable way than at present being done in developed countries. Among the options available to be transferred include the following:

- Vehicles (cars, commercial vehicles) with improved energy efficiency and reduced adverse emissions.
- Improved public transport system (Buses, light rail transit systems)
- Two-wheelers and three-wheelers
- Improved fuels that are alternate to petrol and diesel (ethanol, CNG, LPG)
- Infrastructural changes such as better urban planning, improved road network, dedicated traffic)
- Improved policies and measures to alter traffic volumes.

9 Enabling Conditions for Access

However, to access these benefits, African countries would need to establish certain capacities so as to attract outside investments and business enterprises. These capacities can be summarised as follows:

- A very strong regulatory framework that is transparent, enforceable and clearly defined. This is absent in many developing countries. In addition, there should be a system of arbitration.
- An established business environment (effective banking system, insurance companies, stock exchange, etc)
- Organised project information base that can provide information to investors
- Organised and co-ordinated public institutional framework
- Adequate and well maintained public infrastructure (energy, water, roads, etc)
- Critical mass of experienced project developers and business managers and strategists
- Critical number of small and medium scale local firms capable of exploiting market niches and can undergo sub-contracting to required standard
- Strong and effective partnerships between government, private sector and NGOs so that different voluntary relationships can be formed.

National projects should be on the following: basic energy related infrastructure, regional and sub-regional projects in transportation, energy housing, and etc. basic infrastructure.

10 Conclusions

Africa's contribution to GHG emissions can is resulting to current climate change threat is small but it is one of the most vulnerable areas in the world and this is increasing the attention of the continent in the global debate. However, the debate and emerging initiatives provide the continent with opportunities especially now that it is having declining overseas development assistance and foreign direct investments. Accessing these initiatives will require significant improvement in the continent's capacities in both the public and private sectors.

11 References

Jempa C & Munasinghe M, (1998), ''Climate Change Policy: Facts, Issues and Analyses". Cambridge University Press, U.K

UNEP, (1997), 'Global Environment Outlook'. United Nations Environment Programme, Nairobi, Kenya. Oxford University Press, New York, USA

WRI, (1996), 'World Resources: A Guide to the Global Environment 1996-97' World Resources Institute, WRI/UNEP/UNDP/World Bank. Oxford University Press, New York, USA

ORNL, (1993), 'Trends 93' Oak Ridge National Laboratory.

Report of the afternoon session, Monday 18 May 1998: Mitigation Methodology and Country Studies

Rapporteur: Ian H. Rowlands

"Methodology I: Basic Concepts – Rationale, Guidelines, Coverage" (Henrik Meyer), "Methodology II: Steps in Mitigation Analysis" (Peter Zhou) and "Methodology III: Sectoral Analysis – Energy Sector" (John Turkson).

Together, these three presentations laid out the common methodology that has been used in the UNEP/GEF and DANIDA studies on national climate change mitigation. Much of the content was taken from the Methodological Guidelines of the UNEP/GEF Project "Economics of GHG Limitations" which are an extension of the guidelines developed in the UNEP GHG Abatement Costing Studies. (See references in introductory paper by G.A. Mackenzie.)

Questions of the presenters primarily focused upon specific details of the methodological process – that is, clarifications on particular elements of the guidelines. Participants asked, for example, for clarifications about how labour was costed, about the difference between short- and long-run cost curves and about the macroeconomic assumptions employed by the models.

It was also noted by participants and speakers that mitigation is but only one element of climate change studies. Among other elements, climate change impacts (and the "economics" thereof) would also be important in national decision-making; that, however, is not explicitly investigated within the framework of this set of projects.

Many speakers stressed the importance of relating the mitigation options and scenarios to national development priorities. Moreover, not only is it important to relate the climate change options to developmental aspirations, but also to present those results in terms that are understandable by, and useful to, policy-makers.

The value of having stakeholders – government, business, NGOs and the like – involved in the process from the beginning was stressed by many participants. This will not only increase the potential impact of the findings, but it will also most likely improve the quality of the study as well. (Indeed, one participant argued that it is crucial to have government officials believe that the ideas originated with them in the first place!)

The dynamic nature of the mitigation analyses was stressed. If additional information is provided at some point, then elements of the study – that is, the baseline and the scenarios – should be amended appropriately.

The conference then went on to investigate individual reports from participating countries.

Botswana Country Study Report (Peter Zhou)

Questioners explored a number of different elements of this presentation. The social benefits and costs of mitigation options – which are investigated by means of a "multicriteria assessment" – were among them. It was also noted that the UNEP Centre is investigating further these social benefits and costs: Prof. Anil Markandya has prepared a paper on the

subject, and empirical investigations will soon be undertaken, building upon a couple of the mitigation studies.

Particular elements of the methodology were also revisited, as the first application of "practice" to the guidelines was presented by means of this Botswana country report. In particular, information about the price of energy used was requested; the world price of oil vis-à-vis the local price of coal was duly noted.

Mauritius Country Study Report (D.D. Manraj)

After this presentation, questions about particular elements of the Mauritian situation (for example, transport characteristics) and the climate change process at the national level (participation, for example, of nongovernmental organisations) were posed.

Meanwhile, a methodological point that arose related to the ways in which decisions about where activities should be represented – that is, as either a baseline element or as a mitigation Mauritian experience that prompted this discussion was to do with electricity production from bagasse. The Chairman noted that Brazil faced a similar dilemma in an earlier study (with regard to ethanol as a transportation fuel). In his opinion, however, it was unlikely that such activities could now not be placed in the baseline; consequently, they would not be available as mitigation options.

Zambia Country Study Report (Prof. FD Yamba)

Following the presentation, participants initially looked for clarifications – on such elements as: the extent of electrification, the take-up of electrical devices (particularly stoves) after electrification; the level of forest cover in the country; how to account for emissions on "shifting cultivation"; and emissions from the forestry sector.

The ways in which the mitigation options relate to developmental plans were also explored. Among other things, the implications of additional coal-briquetting were discussed.

One participant initiated a comparison of the Botswana and Zambia cost-curves. He noted that the two are very similar, even though the countries have very different "kinds" of economies, and economic histories as well.

Report of the morning session, Tuesday 19 May 1998: Country studies (continued)

Rapporteur: Yinka R. Adebayo, UNEP Regional Office for Africa, Nairobi

1 Introduction

The chairman, Bubu Jallow (The Gambia) noted that most of the presentations the previous day did not focus on the participation of the grassroots. He further noted the importance of the grassroots because if their direct involvement in real-life activities. Following that note, the presentations followed.

The scheduled presentation by Willy Makundi, Lawrence Berkeley National Laboratory, did not take place as Dr Makundi was unable to attend the conference. The planned paper, Mitigation Options in Forestry, Land-Use Change and Biomass Burning in Africa, is however included in Part 2 of these proceedings.

2 Tanzania Country Study (Mr. Hubert Meena)

The presentation highlighted the economic background of Tanzania and noted that the country had undergone Structural Adjustment Programme (SAP) from the formerly closed socialist economy. In Tanzania, agriculture presently plays the most significant role but it is expected to play a less important role in future with the expansion of manufacturing base.

On climate change activities, an inventory is already in place, greenhouse gases mitigation study and capacity building programmes as well. In Tanzania it is estimated that about 55% of greenhouse gases come from CO_2. The presentation identified various options for the greenhouse gas mitigation. Notes on the long-term scenarios made were bearing in mind the future of the economy. External trade and debt repayment were identified as issues of importance to the future economy. Internally, reform of the economy will play an essential role.

Phase II study concentrated on forest and land-use in greenhouse gas mitigation. The link between these and energy was given, especially within the framework of natural energy balance. Household plays the most significant role – of over 88%. Biomass fuel constitutes more than 90% of the energy source in Tanzania. Annual fuelwood and charcoal use was estimated at 32 million m^3. He gave a highlight of three scenarios constructed, the first being "catastrophic scenario", under which it was noted that in future the forest resources will be totally exhausted. The second one was the "Tanzania Forest Action Plan (TFAP) scenario", which is based on forest rehabilitation plan. The third scenario is the mitigation scenario. Emission from energy source was estimated at the level of household and commercial.

3 Senegal Country Study (Mr. Ibrahima Sow)

Most Senegalese stay in the rural area. Senegal imports more products than she exports and noted that the industrial base is not very developed. The sector that emits most greenhouse gas is energy, fuelwood by agriculture. The LEAP model has been used to develop the scenarios with most of the data coming from the information in the 9^{th} National Development Plan.

Energy consumption from household is very important in Senegal because of the use of charcoal and fuelwood. 64% of the population lives in the rural area, thus energy demand from that part is also high. Electricity supply is mainly from thermal while the dam on River Senegal will be a major supply in future; as soon as agreement is reached between Senegal, Mali and Mauritania. Energy use in Dakar is high and more will be consumed in future as more people are expected to live in the urban part of the country in future.

One important mitigation option is the electrification of villages through solar power. Provision of rural infrastructure is also important. This appears to be the most important option. Another one is to improve afforestation. Improvement of industrial boiler is also important.

The need to check the emission figures from wastes was raised at question time.

4 Lesotho Country Status (Ms. Mampiti Matete)

The project is hosted by the National Environment Secretariat. The inventory is now complete but other parts are not. Mitigation analysis centre on energy sector and land-use and forestry sector. The group in the energy sector has been able to identify some options. 3 mitigation options were identified: *i)* reforestation of indigenous forest, *ii)* afforestation of degraded land, and *iii)* rehabilitation of wetlands. Lesotho needs assistance on the use of analytic model in their study as they now use manual methods to calculate their projection. Like many countries, they also have problems with data.

5 South Africa Country Status (Ms. Gina Roos)

The presentation focused mainly on workplan. The presentation was on mitigation component, GTZ/US Country Studies support, with the Department of Environment Affairs. Emission, vulnerability, mitigation and policy are the four components of the project. Emission inventory use 1990 as the baseline and IPCC 1996 revised guideline. The study has identified areas of overlap and worked out modalities for preventing these. She also noted the need for detailed design.

During discussion time, the need to get clarification on what is ongoing was noted. A representative of South Africa gave further highlight on this. The real issue in South Africa is the limited capacity at government level while capacity in the private sector is very strong.

6 UNDP/GEF Capacity Building Project (Mr Moussa Cisse)

The project is based on training, awareness reusing activities, implementation of some aspects of conventions.

Ghana presented a report on the progress made this far in the implementation of the project. **Kenya** also presented a report on the studies. **Mali** noted that their studies are finished. 3 sectors: agriculture, forestry, and energy sectors. Mitigation options based mainly on change of technology in the household sector. Options by technology and associated costs were shown.

7 Maghreb countries: Morocco, Algeria, Tunisia, Libya (Mr. Samir Amous)

Samir Amous noted that there are different levels of achievement in the different countries. Activities also include enhancement of regional and national networking. He also noted the delay in the commencement of the activities as a result of the problem of understanding the process and terminologies in these mostly French speaking countries. Highlights on the objectives and activities were given and the progress thus far as well as what will be done in the near future. A report on the GEF-World Bank Solar Water Heating Project was also presented. It costs US $ 4 million. The projects aim at collective/public buildings.

Report of the afternoon session, Tuesday 19 May 1998: Experience and lessons learnt.

Rapporteur: Dr S.J. Lennon, Eskom, South Africa

This session, chaired by C. Mzezewa of the Department of Energy, Zimbabwe, started with Dr RS Maya presenting Zimbabwe's experiences in compiling their initial national communication. The main points of his presentation were as follows:

- The history of the communication from Rio in 1992 to present and the difference between Agenda 21 and the national communication.
- The initial academic focus in 1992 with a non-systematic approach evolving to a more rigorous, systematic and inclusive approach.
- The process and system utilised as summarised in the diagram (as per overhead).
- The Ministry of Transport and Energy/UNITAR project which enabled the creation of national committees to advise the government.
- Difficulties experienced in the application of methodologies and models.
- The importance of national and regional dialogue in ensuring the relevance and alignment of mitigation options.
- The need to access technical data and information that aids the evaluation of options.
- The transition from national priorities (wishes) combining that with the interest of the climate change arena and linking these to development investment decisions.

Dr T Ngara then presented details of the Zimbabwe national communication indicating:

- The structure of the process used to compile the report (overhead).
- Problems in data formatting, data collection, assumptions compromising accuracy, business confidential data, lack of reliable livestock statistics, etc.
- The report highlights Zimbabwe as a net sink due to sustainable forestry management.

- Important issues included:

  - Need for additional information.
  - Historical trends.
  - Objective, status, type of policy and measures.
  - Monitoring, evaluation and costing of impacts and options.

- Further activities:

  - Construction of data bases.
  - Develop projects mentioned in the document.
  - Build capacity for future communications.

During the discussion the following issues were raised:

What advice could be given to others and how would you have changed your approach?

- Include an early national capacity to analyse sectoral options. Too much dependency on a small number of people. The learning curve is very steep - even Annex I countries are still learning.

Describe structure and personnel in the Climate Change office.

- It was converged on UNDP capacity building personnel, adapted once the need to prepare the document was identified. It is a small office forced to employ sectoral specialists in giving input to the study.

Experiences appear biased to Energy Sector - how about other sectors, like land use and forestry?

- The literature has a strong energy sector bias. We focused on inventories, then mitigation due to fund availability. The region is lucky to have numerous specialists in the other sectors that overcame the energy sector bias.

How will capacity building be integrated with the national communication?

- This is an on-going process to be integrated into future communications.

The session then moved onto a panel discussion dealing with lessons learnt, synthesis and observations - focusing on cross-cutting issues. In their introductory remarks the panellists highlighted the following:

H Meyer: Focused on methodological issues.

- How to construct baseline and mitigation scenarios (overhead). Both optimistic and pessimistic scenarios can be developed, giving four potential scenarios. It is important to be cautious in stating an optimistic baseline.

S Amous: The mitigation process is on-going with limited time to integrate issues in the national communication.

- There are in general stakeholder based national committees with opening and closing workshops and little in-between.

- Difficulties experienced include:

  - Distinguishing between baseline and mitigation.
  - Finances to implement options.
  - Data availability.
  - Durability of the process.
  - Ownership at sectoral and national level.
  - Mitigation must not be regarded as academic work.
  - Scenario and macro economic assessment help required, as well as methodological assistance in vulnerability and adaptation and some sectoral mitigation assessments.

RS Maya: Communications will improve as countries learn from each other.

- Need to establish a balance between promoting national goals and presenting for the global audience in a specific format.

Y Sokona: Facing the dilemma of understanding the 3Ps:

- Problem
- Process
- Product

- Critical aspect is timing in getting all 3 together.
- Critical issue is to make outputs policy instruments.

K Tutu: Need more focus on grassroot participation.

- Inter sectoral implementation of options is important.
- Process made easier if it is part of the development process.

In the ensuring discussion the following main points were made:

- Sustainability of the process is of concern, as is data availability, ownership and lack of representation in the process.
- Climate Change is relatively new, as such policy makers and grassroots involvement should wait until all issues are understood.
- We need to put what we know into products targeted at policy makers and grassroots.
- Baseline projection methodologies need to include debt serving. This is difficult to include here - it should be done in the macroeconomic assessment.
- We should be talking abut development options, not mitigation options. Rather look at national priorities and then interpret in terms of mitigation options. (There appeared to be general agreement on this comment).
- Once you have a basket of mitigation options, you use development priorities to select options for implementation.
- Cost evaluations of projects need to include a holistic assessment of impacts at a macro economic and project level. They need to include consideration of balance of payments, debt/equity, employment, foreign exchange, financing, resource flows etc.
- An important issue is selling mitigation options to policy makers. This is highly dependent on data accuracy. Confidence levels in many areas exceed 95%, in others they are lower, but what is important is to state the level of accuracy for data.
- Technocrats need to agree, within the region, as to which models apply here so that policy questions can be accurately answered. It should however be noted that many local specialists worked in the development of models such as LEAP. It is important to understand the processes in your own country so you can select the correct models.
- The role of forests sinks and the relationship of tree growth and harvesting to carbon sequestration was discussed as an area in which these appear to contradictory positions adopted in the region. It was stressed that this is a controversial area that still requires a lot of debate and study before a definitive answer is obtained.
- At the end of this exercise the quality of life of people should have improved in applying a cleaner development path to national development. This must be achieved without negative impact on the nation's GDP.
- The need for an economic benefit to be attached to environmental issues was stressed. Economic drivers and the development of private sector interests are critical in decision making. If the economic driver is not there then mitigation options must not be entertained.

The chair concluded by thanking the panellists and the floor for their contributions.

Report of the morning session, Wednesday 20 May 1998: Country Studies and Regional Studies

Rapporteur: Randall Fecher, EDRC, South Africa

Egypt Country Study (Dr. Zienab Farghly, Egyptian Environmental Affairs Agency, Cairo, Egypt)

After a presentation of the status of the Egyptian mitigation study, Dr Farghly answered questions from the floor:

Will building jetties for coastal protection just shift the sand around without preventing overall loss of beach?

- The jetties and other coastal measures have been planned to avoid any such problems

Which crops are likely to increase in productivity with climate change?

- I am not positive, but I think it is cotton (which grows better in warmer climates)

Have you looked at the wind energy potential for Egypt?

- The Red Sea and western coastal zone have high winds, and already have some wind installations

Shouldn't you be co-operating with the other Nile Basin countries on regional mitigation and adaptation issues?

- That would be beneficial.

Regional GHG Mitigation Options: Methodology (Ian Rowlands, UCCEE and University of Waterloo)

See paper included in part 2. After the presentation the following questions were discussed:

What are the criteria or prerequisites for regional mitigation projects to succeed?

- A common understanding of issues is critical. We can explore options in a study, but we must recognise the differences between countries, which may prevent them from acting on some options.

Is there a danger of being too focused on 'project level' analysis rather than 'national level' mitigation scenarios?

- The analysis should begin with a sectoral focus across the region--this will help you assess the developmental implications. But there is a danger of getting too focused on a particular sector.

Southern Africa Regional Mitigation Study: Power Sector Options (Norbert Nzarimasinga, Southern Centre)

Why don't you know the benefits to the utility of "negative cost" options?

- If something was economically beneficial for the utility, they would already be planning on doing it so it would be in the baseline. So 'negative cost' mitigation options may be negative cost for society but not for the utility.

What is the split between grid and non-grid demand in your analysis?

- Very little off-grid--almost everything is connected to the grid in the long run [note: this is not about off-grid electrification but rather about small power producers not connected to the grid]

How do these options impact regional electricity prices?

- We do not yet know, but it is a key local impact which we will analyse in the follow up study

Is the assumption of zero gas penetration in baseline realistic, given that Tanzania, Mozambique and Namibia are all planning gas projects?

- We welcome additional input on gas development. If IPPs become more important in the region, they may need incentives to move toward clearer forms of power such as this.

How did you define what national policies would be in the baseline scenario?

- The baseline is based on stated government policies in the various countries and public plans

Have you included other GHG emissions (e.g. methane) besides CO_2?

- In the inventory for the GTZ sponsored study, we found that methane emissions are less than one percent of the total GHG emissions from the power sector, so we have ignored them in this first cut.

Southern African Regional Mitigation Study: Transport Options (Peter Zhou, CEEG Consultants)

Have you considered the impact of synthetic fuel use for transport in South Africa?

- To some extent, but not in the petrol emissions factor

What is the impact of road improvements instead of switching freight to rail?

- We looked at rehabilitation of both rail and road. Road improvements are possible and will be beneficial for mitigation.

Panel Discussion: Regional Cooperation for Climate Change Mitigation

Opening Remarks

Ian Rowlands:

- There are many options to explore beyond energy and transport: e.g. regional standards, R&D, training, policy co-ordination
- The Kyoto meeting and protocol points to increasing "internationalisation" of the climate change issue, and regionalisation is occurring in parallel to climate change discussions for other reasons (e.g. economic co-operation)
- There is a need to link SADC region mitigation analysis to other parallel activities in SADC Energy, SAPP, SADC Trade Protocol, etc

Peter Zhou:

- Regional mitigation options should target project with maximum economic and development benefits, e.g. large capital intensive investments which need more than one investor
- Need to understand roles of current actors in region (SADC and SAPP)
- SADC has put forward principle of "multi-speed approach" (different sectors can move at different speeds toward integration) and "variable geometry" (subgroupings of countries who are ready to move can move without all of SADC). These should also be applied to regional mitigation options.
- Much stronger institutional and legal framework is needed to facilitate investment, supported by information exchange throughout the region

Norbert Nziramasanga:

- Countries may not be willing to agree to a common baseline. Competition in certain sectors may reduce cooperation, especially information sharing.
- Financing for regional projects will be complex: what if the project is not a priority for all countries? How are the costs and benefits shared?
- Energy efficiency is still a relatively new concept in many countries.
- The power pool will take time to mature--climate change options related to the pool can not move faster than this.

Steve Lennon:

- Regional decisions are driven by basic social and economic factors, not climate change
- Mitigation is not as important as vulnerability and adaptation currently because Africa will be affected by climate change long before the mitigation impacts kick in.
- Regional cooperation should begin on vulnerability and adaptation as a priority: e.g. strengthen basic and energy infrastructure, regional electrification, water supply cooperation, etc
- Economic analysis must consider larger issues such as jobs, the health of major industries, GDP impact, etc: e.g. in South Africa, banning HFCs could cripples some gold mines, and cutting out SF_6 would compromise power infrastructure.
- We should use win-win opportunities to raise funds for regional initiatives: e.g. electrification technologies, reducing line losses, regional load management, efficiency of power plants, road and rail transport, sustainable biomass use, distributed power utilities

- Institutional structure for regional research collaboration: Power Institute of East and Southern Africa (PIESA) will focus on technology issues, standardising equipment and operating environment, and developing centres of expertise.

John Turkson:
- West Africa has huge development needs and currently has minimal electricity or transport infrastructure--the situation calls into question whether mitigation and development really are in the same direction.
- ECOWAS is not functioning effectively, and can not currently achieve regional objectives.
- West Africa has traditionally used hydropower, but because of unreliable water regimes, the move may be towards more fossil fuel power which will increase GHG emissions. For example Ghana was 95% hydro but might shift towards only 50% hydro in the long run. In this environment, energy efficiency will clearly be critical to minimising the emissions increase.
- Land locked countries in West Africa need reliable transport to coast--can this transport system be developed as part of regional mitigation option, for example through strategically located storage depots for rail/road transport?

Samir Amous:
- Climate change creates a new opportunity for regional integration and action--an opportunity to develop an integrated vision of development that includes mitigation, adaptation, etc.
- There may be many benefits from regional cooperation: creating larger markets, more financing available, etc.
- Regionalisation is unavoidable, so we must work to exchange experience and replicate successful initiatives--in this sense information exchange is a key link.
- On the down side, political problems clearly stand in the way of greater regional cooperation. We must be able to convince policy makers that a regional approach to vulnerability and adaptation, for example, will be more effective than a national one.

Discussion

Regional economic organisations have been unable to secure additional resources or operate effectively (particularly in West Africa), so what are the concrete possibilities or steps which are needed? What does the SADC experience tell us?

> *Steve Lennon:* We will only benefit if we can manage the political and business environment around climate change. Africa can now sell something new--it can sell mitigation strategies. This highlights the importance of how the Clean Development Mechanism is defined to get things going, you may start from small initiatives and build up (as happened with SAPP)
>
> *Peter Zhou:* States must be fully informed of mitigation ideas so that they take ownership of them. This is happening now in the Zimbabwe GTZ project.
>
> *RS Maya:* Africa must tap global financial mechanisms and leverage local investments more effectively.

Are the attitudes of financial institutions toward Africa one of the major barriers to regional development, as well as the huge differences between countries?

> [No answer]

Comment from O.R. Davidson: Out of 53 African states, only 5 to 7 could survive independently--we must cooperate. All international agreements are looking to regional

opportunities to make developing countries more attractive for cooperation. Although sovereignty issues are clearly a barrier, we can already see widespread informal trade and cooperation--the environment does allow this even if government and mainstream industry are lagging.
We should increase investment and research collaboration between African countries and redirect the multinational corporation investment that currently flows between African countries to more sustainable projects and initiatives.

How can we prioritise regional mitigation options when countries may have different priorities within the region?

Ian Rowlands: This is bound to be a hurdle, but multi-criteria assessment of project opportunities could help.

What are the actual mechanisms for regional cooperation? What actions are needed to utilise these mechanisms more effectively? And how would individual countries be bound by regional commitments?

S.J. Lennon: PIESA is appropriate for technical and research issues. SAPP will promote trading and regional market development. But in the end it is political cooperation that is critical. There is no SADC position on climate change or any SADC CC activities of any kind. Rather than creating new mechanisms, we must use the existing ones more effectively.

Peter Zhou: SADC members are getting more serious, and SADC is supporting some regional transport initiatives with donor cooperation.

John Turkson: In West Africa people claim that differing legal systems is a major barrier, but in reality cooperation is taking place on a bilateral basis. If utilities can agree, then trade will work in electricity. Power sector reform will influence the outcome, but we do not understand the links yet.

RS Maya: There is a need for dialogue on a regional pool for West Africa. SADC is making progress through the Energy Protocol, Energy Strategy, and Action Plan. It is the last step--financing these projects--that is the most difficult and important. With regard to the regional mitigation study, the most important output is the methodology and the issues that it raises rather than the numbers themselves. The GTZ project will be a follow on which will look at specific mitigation options under SAPP. This information is necessary to 'defend' these regional options against a call for isolated national investment plans.

Information exchange is difficult between sovereign states or between utilities because they need state permissions.

John Turkson: Countries are overprotective of information, and are concealing information which has no real bearing on national security. The public domain for information must be promoted more actively.

What are the barriers to greater use of solar energy?

Steven Lennon: Technologies exist, and small scale solar is attractive for remote areas. Eskom has an off-grid electrification programme in place. Large scale PV is more difficult, but Eskom is looking at a pilot project for a 100-200 MW solar thermal plant.

Peter Zhou: Regional statistics are needed to answer questions about potential for renewables.

Who has access to all of the information in the regional studies? How can we disseminate this information? How can we initiate a policy dialogue across the sub-regions?

N. Nziramasanga: The demand for networks and information will not happen until government officials are tasked to create it. When we come up with regional options without a strong regional government commitment and capacity to take up those options, we risk non-Africans benefiting more from the projects than Africans.

RS Maya: For the GTZ project, Southern Centre initiated it, initially to look at the POLITICAL impediments to regional cooperation. The first two phases, however, will be doing the basic background research, while phase III will look at barriers. Five researchers on the project at from SAPP utilities, and the project will involve SAPP Environment Sub-committee, SADC TAU on the steering committee.

Report of the concluding session: Relating Climate Change Activities to National Development and National Communications

Panellists: Youba Sokona, Ogunlade Davidson, Yinka Adebayo, Samir Amous, Todd Ngara, Gina Roos

In the final session of the conference, the panellists and the conference participants shared their reflections on climate change issues in general and the mitigation analysis studies in particular.

A general view was expressed that the participation of African institutions and individuals in the climate change debate has been limited until now. There was a strong need for governments in the region to be more actively involved through financing of and participation in projects, such as studies of vulnerability of their countries to CC, adaptation and mitigation of CC. It was suggested that such studies should rather complement the ongoing Enabling Activities to the extent that they can provide a framework to ensure that projects identified under the CC activities are consistent with the sustainable development objectives of countries.

The panellists emphasised that a mitigation analysis study should be seen not only as an end in itself but must be seen in the context of the development process of the region. While Parties to the Convention have an obligation to prepare and submit National Communications, this should also provide an opportunity for pursuing the capacity-building process of integrating Climate Change issues into national development programmes. It was suggested that the success of the National Communication preparation process could be judged, not only on the quality of the product but also on the extent that it helps countries to internalise the knowledge gained in the process.

It was noted that some level of capacity has already been built in the countries that have taken part in the UNEP/GEF, Danida and other mitigation analysis projects covered in the conference. However the question: "How to sustain and improve the capacity that has been built during this project so that effort and resources invested in the process would not be wasted?" was raised. One important aspect of follow-up relates to networking among the participating centres and others in the region engaged in such studies. It was the view of the participants that the seed for networking has been sown among the region's small group of Centres of Excellence and individual researchers by the project and similar projects of this kind in the region. This, it was agreed, has to be nurtured to grow and enhance the exchange of information.

On methodology, a panellist expressed the importance of having common concepts (cost concepts, for example), and clarity of assumptions underlying the analysis being done. It was argued that these could facilitate cross-country comparisons. Another methodological issue raised was the determination of system boundaries between sectors. Establishing system boundaries for analytical reasons was considered of critical importance to the results of mitigation studies because ill-defined system boundaries can lead to double counting. For example, land-use and agriculture are often used synonymously or interchangeably. Similarly, cross-sectoral issues between, for instance, energy-agriculture-forestry concerning supply of and demand for biomass could affect the result of mitigation studies if the boundaries of the sectors are not determined ex-ante.

Comments were presented from a number of conference participants from countries that had not so far carried out mitigation studies, nor participated actively in the climate change debate. Reactions were generally positive and there was a view that the presentations and discussions at the conference had provided valuable insights into the topics and a good introduction climate change mitigation issues. This enhanced awareness would be helpful to the participants in their forthcoming GEF Enabling Activities with UNDP and UNEP.

Closing Remarks. Dr. Yinka R. Adebayo

UNEP Regional Office for Africa, Nairobi

Mr. Chairman Dr. Gordon Mackenzie, Ladies and Gentlemen

My task is simple: to make a short remark on behalf of UNEP as we declare this conference closed.

We have in the past three days witnessed excellent presentations by experts on various issues relating to climate change and development in Africa. Discussions attending to the presentations have as well been enriching and exciting. I therefore have all the reasons not to trust that all participants here and the potential beneficiaries of the conference outputs will be satisfied with the products therefrom.

In the past decade, following the recommendations of the Second World Climate Conference (SWCC) organized by UNEP and WMO, climate change issues have climbed the ladder in the arena of international diplomacy and scientific research. Consequently therefore these issues dovetail on economic and development programmes, especially in developing countries and those countries whose economies are in transition. We have heard over and over again, how African countries lag behind in their development agenda. Civil unrest, aid dependency syndrome, demobilization of the little existing human resources capacity, gross disregard for organized intellectual guidance and extensive corruption in most facets of the society have been the cogs in the wheel of development and environmental security in most African countries. As painful as they look, these are the realities of African crisis which have to be dealt with without any fear of favour. Unfortunately it is not within our mandate here as experts to deal with them as they deem fit. Nonetheless we should not fight shy of these observations, otherwise all our efforts will continue to be wasted.

Ladies and Gentlemen, allow me to note further, that it is now universally accepted that the issue of climate change and attending activities involve multiplayers from meteorologists to engineers, economists, lawyers, policy makers, journalists and even law enforcement agents such as customs officials who now have the responsibility to look out for illegal trade of ozone depleting substances (ODS). This now brings the understanding of weather and climate issues beyond weather forecasting and irrigation to bread and butter, and even basic concern about the very survival of human race. The challenge to all of us as experts is to continue to open up doors to accumulate and integrate other experts so as to enable us attain a common goal in an effective manner.

I cannot properly end this note without acknowledging the distinguished role of the conference organizers and our hosts. In particular I thank the team of experts from the UNEP Collaborating Centre on Energy and Environment (UCCEE) from Risø who have undoubtedly meritoriously worked as good technical ambassadors of UNEP, especially on climate and energy issues since inception. It might interest you to note that I stepped into the shoes of Dr. John Christensen, so to speak, in UNEP after he departed the organization to set up the UNEP Centre. I am proud to have been able to work with him and Dr. Gordon Mackenzie especially at the early stage of the development of the Risø Centre. It can therefore not be a surprise to me that Dr. Mackenzie has been widely acknowledged for his wisdom, energy and enthusiasm he demonstrated as a brain behind the success of this conference. I thank Danida for supporting this conference, Dr. R.S. Maya and his colleagues at the Southern Centre for Energy and Environment for excellent back-up. Within the framework of the UN GEF family please join voice with me to send our words of appreciation to the UNDP

and World Bank who have been properly represented by Professor Ademole Salau of the UNDP. I have known Professor Salau for many years as a top environmentalist and university administrator. To those of you who did not know, Professor Salau was a vice-chancellor of a top federal university in Nigeria, an experience he has successfully brought to bear in his successful task so far as a GEF coordinator in UNDP.

Ladies and Gentlemen, finally let me thank the Government of Zimbabwe for playing, as usual, a good and friendly host to this important activity. On behalf of the Executive Director of UNEP Dr. Klaus Toepfer, who sends his sincere greetings and message of solidarity to you all, it is my great honour and pleasure to close this conference.

Thank you.