Mitigation and Adaptation Strategies to Climate Change and Innovation Systems in Southern Africa
ACKNOWLEDGEMENTS

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DISCLAIMER

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Agriculture is a source of livelihood for most of rural communities in Africa. In the Southern African Development Community (SADC), there are many challenges that affect the agriculture sector. Among these are low productivity levels, a decreasing trend in the gross domestic product, high inflation rates and low levels of indigenous innovation and investment. In addition commodities such as fuel and other energy are becoming increasingly scarce and environmental degradation is contributing to declining prosperity. The key problems faced in the sub-region are extreme climates with pronounced drought and floods events, loss of productivity of agricultural arable land and range as well as high levels of deforestation and over utilisation of natural resources exacerbated by unpredictable climate changes. Whilst it is acknowledged that the world’s poor are the most affected by the effects of climate change, policies to mitigate climate change may in the short term also have as much impact as climate change itself.

The growing demand on biofuels impacts on food security and cause dilemmas concerning the use of land and conservation of biodiversity in producing countries. Many countries have developed policies to promote affordable, alternative energy resources capable of maintaining current energy consumption standards. These include bio-ethanol from grains and biodiesel from vegetable oils and fat supporting further economic growth and reducing fossil dependency.

In Southern Africa, countries are strategizing on how to increase biofuels production. South Africa targets to use maize, *jatropha*, sugarcane and sunflower. Malawi has targeted to have biofuels from *jatropha* contributing to its national energy needs; Mozambique and Mauritius are considering boosting biofuels production using sugar cane. In addition Mozambique is considering jatropha, palm oil, cassava and copra as source for biofuel. Swaziland is considering using cassava, Tanzania *jatropha*, Zambia, sugar cane, *jatropha* and cassava and Democratic Republic of Congo palm oil.
Climate change compounded by global poverty are serious challenges to the future health and prosperity of our planet. An effective attack on poverty and the ill-effects of climate change requires taking comprehensive action that encompasses both issues. It is therefore important to address the following questions; the world to understand how the poor cope with climate change and the cost they incur?, If the agriculture sector can meet biofuel demand without compromising food security? Farmers may benefit from high commodity price but what about net purchasers of food; how effective are biofuels in mitigating climate change?; will the increase in biofuels demand increase land use competition between food and fuel crops and result in tenure insecurity for small farmers; will the introduction high-value biofuels crops not impact on conservation of agro-biodiversity by promoting mono-cropping? and how does biofuels development affect the food security, energy needs and employment for rural communities.

In an effort to try to get general understanding what is on the ground in the SADC region and what information is available to address the above-mentioned questions RAEIN-Africa commissioned three case studies (two on “climate change adaptations strategies” and third on impacts of biofuels on rural livelihoods”) and five country status studies (3 on Climate change and 2 on biofuels) under the following research themes under the Innovative Technologies for Enhancement of production systems and Management of the environment (ITEM) project: a) Understanding how communities are adapting to the impacts of climate change and b) Strengthening understanding of the status of biofuels in southern African societies (farming systems, socio-economic implications, markets and trade).

RAEIN-Africa and it’s partners through this conference provided a central forum to develop an improved and shared understanding of the climate change impacts on marginalised communities and the associated coping and adaptation strategies in Southern Africa Region. This report therefore, shares the deliberation of the first Regional Conference on “Mitigation and adaptation strategies to Climate Change and innovation systems in Southern Africa held in March 2010, Johannesburg, South Africa.
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<td>ACHM</td>
<td>Africa Centre for Holistic Management</td>
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<td>AU</td>
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<td>AWG-KP</td>
<td>Ad Hoc Working Group on the Kyoto Protocol</td>
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<td>AWG-LCA</td>
<td>Ad Hoc Working Group on Long-term Cooperative Action</td>
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<td>CAADP</td>
<td>Comprehensive Africa Agriculture Development Programme</td>
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<td>COP</td>
<td>Conference of Parties to Conversion of biological Diversity</td>
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<td>GHGs</td>
<td>Green House Gases</td>
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<td>HIV/AIDS</td>
<td>Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome</td>
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<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
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<td>ISP-TEESA</td>
<td>Innovation for sustainable Development and Poverty Reduction: Towards an enabling environment for systems of innovation in Southern Africa</td>
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<td>ITEM</td>
<td>Innovative Technologies for Enhancement of production systems and Management of the environment</td>
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<td>MDGs</td>
<td>United Nations Millennium Development Goals</td>
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<td>New Partnership for Africa’s Development</td>
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<td>SADC</td>
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Executive Summary

According to the fourth Assessment Report of the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) Intergovernmental Panel on Climate Change (IPCC) released in 2007, some climatic change have already been observed on the African continent. Southern Africa is in a critical zone as; increasing temperatures have been experienced in Namibia, Zambia, Botswana and Mozambique (New et al., 2006). This has notably led to an increase in droughts and floods in Namibia, Zambia, Zimbabwe and Mozambique. In Southern Africa, the impacts of climate change are varied, for example, the area suitable for agriculture, the length of the growing season and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. In response to these challenges, a number of adaptation strategies have been undertaken, albeit with varying degrees of success. It is against this background that the Regional Agricultural and Environment Initiatives Network-Africa (RAEIN-Africa), sought to contribute in addressing and reducing the impacts of climate change of many livelihoods in southern Africa.

RAEIN-Africa facilitates and promotes science, technology, policy and society interface for sustainable livelihoods using innovation systems approaches. Under one of its programmes Innovation for sustainable Development and PovertyReduction: Towards an enabling environment for systems of innovation in Southern Africa (ISP-TEESA), RAEIN-Africa sees the essential need of the Southern African countries being able to address the challenging issues of climate change through creation of platforms for sharing best practices on mitigation and adaptation measures.

RAEIN-Africa is focused on promoting applied discussion on key issues linking climate change and development, providing a platform for the development and dissemination of good practice and innovation, providing an entry point for accessing networks in Africa and beyond, and acting as a Forum within the SADC for the elaboration of critical strategy and policy relevant decision making. This is by adapting to the needs of all stakeholders, making it easier to access information that will help in reacting to the increased challenges.
The first Mitigation and Adaptation Strategies to Climate Change and Innovation Systems in Southern Africa Conference was held from 23rd to 25th March 2010 at the Birchwood Hotel and OR Tambo Conference Centre in Johannesburg, South Africa. The conference brought together some 54 policy makers, government officials, United Nation agencies, practitioners from local and international Community-Based Organisations and Non-Governmental Organisations (NGO’s), the media and researchers from Southern Africa, to exchange practical experiences, findings and ideas on how to mitigate and/or adapt to the increasing threat of climate change in the drylands of Southern Africa.

The main aim of the conference was to facilitate sharing of experiences, identify gaps in enhancement of community adaptation strategies to climate change, improve country capacities to identify clean technologies that mitigate our emission, and define the role that innovation platforms can play in solving these gaps. In addition to the presentations that were carefully chosen and followed by plenary sessions, there were group work sessions that enabled participants to have in-depth review of the subject at hand ranging from the status reports of climate change within the countries, the energy, science and technology and adaptive management issues of adaptive strategies as well as the legal/policy implications and the innovative systems for climate change adaptation. The status reports highlighted evidence of climate change effects in the region and the need for harmonising the terminologies for ensuring a common understanding around the problem. In the adaptation strategies session, the presentations showed how a cost-benefit analysis of strategies needed to be well understood so as to advise the communities better.

Communication and awareness session was central and key to all debates. There was evidence that a multiplicity of stakeholders needed to be brought on board through participatory communication approaches. The human rights based approach to programming issues of climate change was the highlight of the session on legal and policy implications. Finally, the innovation systems session expounded on the various participatory mechanisms that could be explored to increase the resilience of communities to climate change particularly emphasising the empowerment of rural communities.
The key challenges identified by the delegates were;

- The region was not addressing the effects of climate change with one voice.
- The lack of a strong platform that would demand for the action of various policy decision making bodies.
- The Inadequate Knowledge on climate change issues amongst policy makers in the region to influence global policy debate on climate change.
- Limited centers of excellence and implementation resources within the region.

As recommendations, delegates agreed that RAEIN-Africa had a very big role to play in the SADC region by ensuring that there is cross-sectoral understanding of the issues of climate change instead of it being considered a food security issue. This could be achieved through the following mechanisms:

- RAEIN-Africa is best placed to act as a forum for climate change information sharing starting at national level then regionally;
- Support and utilize case studies within the SADC region as a way of improving on climate change advocacy – as evidence to influence decisions;
- Broadening National Working Groups to be more inclusive by including climate change issues on their agenda;
- Partnering with existing regional structures or institutions who are already working on climate change e.g. Food, Agriculture and Natural Resources Policy Analysis Network; and
- Being more proactive at various fora and lobby regional bodies (SADC, New Partnership for Africa’s Development (NEPAD) Planning Coordinating Agency (NPCA), etc) to include climate change issues on their agenda.
- RAEIN-Africa should strategically engage partners in the region to position the region in a better position for the Conference of Parties to Conversion of Biological Diversity (COP) 17 to be held within South Africa.
1. BACKGROUND

In the past nine years (2000-2009) more scientific data on climate change has been made available (IPCC, 2001, 2007). Models suggesting global warming have been constructed and show that there are minor variations, the bulk of the data suggest increasing temperatures and a disturbed pattern of precipitation. According to the fourth Assessment Report of the World Meteorological Organization and United Nations Environment Programme Intergovernmental Panel on Climate Change (IPCC) released in 2007, some climatic change have already been observed on the African continent. Southern Africa is in a critical zone as increasing temperatures have been experienced in Namibia, Zambia, Botswana and Mozambique (New et al., 2006). This has notably been observed in an increase in droughts and floods in Namibia, Zambia, Zimbabwe and Mozambique.

The IPCC report also detailed many future impacts of Climate change on agriculture. In Southern Africa, the area suitable for agriculture, the length of the growing season and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. In some African countries, yields from rain fed agriculture could be reduced by up to 50% by 2020. Literature on the impacts of climate change on food security, (Klein, 2001; 2008; Leicheinko and O’Brien, 2002 Boko, 2007) on health of communities in vulnerable areas such as Lesotho and the adaptive strategies taken (Ziervogel et al, 2006) has been documented. IFPRI, in its report on “Climate Change: impact on agriculture and costs of adaptation” reiterates the above information and highlights that climate change will result in additional price increases for most important agricultural products (Gerads et al., 2009). 

The IPCC report suggested several adaptation strategies to deal with projected climate changes which include, changing varieties; more efficient water use; altering the timing or location of cropping activities; improving the effectiveness of pest, disease and weed management practices and making better use of seasonal climate forecasts to reduce production risks. If these suggested adaptations are widely adopted, they could have substantial potential to offset negative impacts from
climate change and take advantage of positive impacts thereby enhancing livelihoods. A comprehensive and integrated approach to planning and implementing the climate change adaptation strategies across the wide range of agro ecosystems in different countries in Southern Africa could help both the planners and local communities to deal effectively with the projected impacts. It is therefore with this background that RAEIN-Africa planned a conference on “Mitigation and adaptation Strategies to Climate Change and innovation systems in Southern Africa”.

The event brought together researchers, policy-makers, NGOs and donors across Southern Africa. The conference was aimed at facilitating knowledge sharing in the region and identifying critical gaps in community adaptation strategies. In addition, the event was designed as a tool for identifying the role of innovative platforms in addressing climate change adaptation challenges (Annex 1). Hence the presentations and discussions were organized around the following themes:

1: *Setting the Scene:* This session provided an overview of the objectives, presentation of the background paper and the policy implications of the Copenhagen Accord on Southern Africa. The official opening was done by a delegate from the NPCA;

2: *Climate Change Status Reports:* An overview of the current status of climate change issues within Southern Africa was discussed under this theme;

3: *Climate change adaptation Strategies:* This session covered different adaptation strategies used across Southern Africa at various levels particularly in the energy, adaptive management, science and technology sectors;

4: *Awareness:* This session discussed the obstacles and constraints faced by stakeholders in disseminating and communicating climate change information across scales and sectors and plausible ways of improving the networking;
5: **Legal and Policy Implications**: This session had discussions on the legal and policy aspects of climate change by particularly highlighting the critical aspect of human rights based approach in climate change mitigation and adaptation efforts;

6: **Innovative Systems**: This session covered some of the innovative ways that have been utilized by communities within the region to enable them adapt better to the effects of climate change;

7: **Outcomes and way forward**: This session was devoted to discussions to facilitate the identification of possible follow-up actions to address specific adaptation needs and concerns in Southern Africa. The discussions were held in six break-out groups which reported their outcomes to the workshop’s final plenary session.

# 2. SETTING THE SCENE

## Welcome and Introductions

The conference facilitator, Dr. Sithabiso Gandure welcomed the participants, who were then requested to briefly introduce themselves by name, organisation and professional background. A total of 54 participants attended the conference as detailed in Annex 2.

## Conference Objectives

Benedict Libanda gave an overview of the conference objectives as detailed in box 1.
Background Papers and Official Opening

Overview of RAEIN- Africa

The Regional Director of RAEIN-Africa, Ms. Doreen Shumba-Mnyulwa gave a brief background on the network’s programmes in the region including the basis for its recent work on climate change. She expounded on the role of RAEIN-Africa in promoting innovation systems approach to research and development by enhancing capacity of stakeholders to undertake research, formulate policies; apply scientific and technological

Box 1: CONFERENCE OBJECTIVES

1. To discuss and suggest appropriate ways to enhance identified coping and adaptation strategies and their integration into sustainable development activities.

2. To develop appropriate mechanisms for continuous information exchange on climate change impacts and adaptation amongst the different countries in SADC region.

3. To create a forum for development workers and marginalized farmers to exchange information and share experiences on climate change adaptation strategies in Southern Africa.

4. To discuss strategies for public awareness and public participation in decision making mechanisms on climate change policies at various levels.

5. To facilitate development of in country innovation platforms on climate change issues for information sharing and coordinated input into policy.

6. To explore the role of innovation systems in achieving the above objectives; and

7. To explore the role of innovation systems in achieving the above objectives; and To discuss and input into sustainable approaches to alternative energy sources for resource constrained communities.
innovations that are people centered and gender sensitive through inclusive and participatory processes. She also reiterated the importance of RAEIN-Africa programme in supporting the attainment of the United Nations Millennium Development Goals (MDGs), regional protocols and the poverty reduction initiatives in the region.

Ms. Shumba-Mnyulwa indicated that the workshop had been organized as part of the wider programme called “Innovation for sustainable Development and Poverty Reduction: Towards an enabling environment for systems of innovation in Southern Africa (ISP-TEESA)”. Under this programme, a project called “Innovative Technologies for Enhancement of production systems and Management of the environment (ITEM)” falls. ITEM has two specific objectives. Firstly, to strengthen and develop capacities of actors in the innovation systems approach. Secondly, to share experiences and learning on how to strengthen resilience to social, economic and environmental shocks and stresses from the emerging development challenges through generation of knowledge on climate change adaptation strategies and biofuels in the SADC region. The conference was therefore well timed and placed within the network’s broader vision of improving livelihoods in the region.

Ms. Shumba-Mnyulwa concluded by thanking the participants and challenged them to ensure productive discussions, learning and exchange of experiences that would ultimately contribute to the improvement of livelihoods of the majority of the people in the region who are at risk to climate change impacts.

Implications of the outcome of the Copenhagen Conference for Southern Africa

Mr. Percy Makombe gave a presentation on “the implications of the outcome of the Copenhagen Conference for Southern Africa”. He argued that the Copenhagen climate conference ended in confusion culminating in an accord that was “noted” rather than “approved” due to lack of procedures and neglect of the chairs of the working groups on Long-term Cooperative Action and the Kyoto Protocol. This scenario
presented challenges for the region. In general, some interventions proposed, especially from the North do not adequately deal with the climate change problems of Africa. At the regional level, countries were not speaking with one voice. The lack of a coordinated voice meant that negotiations were weak. The participants also agreed that this was due to weak discussion and knowledge sharing platforms on climate change issues within countries.

The plenary suggested the need for coordinated sharing of information amongst countries and dissemination of information on a wider scope. Such a step would enable the creation of critical masses for debating and negotiations at the global level where decisions are made. Countries needed to work together within a multi-sectoral framework towards mitigation and adaptation efforts. It was reiterated that every opportunity for lobbying, education and awareness around climate change issues should be utilised from local to regional levels. The experience and role of civil society organizations in advocacy work was equally critical.

**Official opening statement**

The workshop was opened by Dr. Sloans Chimatiro on behalf of Prof. Richard Mkandawire (Head of the Comprehensive Africa Agriculture Development Programme (CAADP), NPCA). His speech is detailed in Annex 3. He relayed the importance of reacting to the growing threat of climate change and saw gatherings like this as an important step in the process of addressing climate change in the SADC region. He indicated that these strategic partnerships needed to be strengthened especially before the COP 17 due to take place in South Africa. The fact that agriculture production relies on rainfall increased the region’s vulnerability to climate change and retarded progress towards attaining MDGs. He however re-affirmed that great opportunities do exist for agriculture to generate more wealth for the continent if climate change issues are brought to the fore by all stakeholders and integrated with other national and regional development plans. Dr. Chimatiro emphasised the role of science and technology innovation in enhancing climate change adaptation and mitigation strategies. He stressed the need to have the ability within the
region to generate, translate and utilize scientific information for decision-making and policy formulation towards addressing climate change challenges.

Participants were challenged against generating technologies that cannot be used by the farmers either because they are irrelevant or are merely not easily accessible. As a way forward, Dr. Chimatiro informed participants that NEPAD and the African Union (AU) Commission were ready to partner with RAEIN-Africa so as to establish centres of excellence within the region through mentorship programmes for climate change experts across the region. In this respect, special emphasis should be directed towards improving linkages between research, planning, policy and practice. The new structures within NEPAD had been formed as a result of the 14th Ordinary session of the African Union Assembly resulting into the NEPAD Planning and Coordinating Agency (NPCA) whose emphasis was on programme implementation, strategic resource mobilization and efficient support systems to ensure effective programme delivery. This new structure provides a much more efficient body for dealing with growing challenges in Africa including climate change.

3. STATUS REPORTS OF CLIMATE CHANGE IN SOUTHERN AFRICA

This section provides a summary of key issues, identified gaps and challenges as well as recommendations for supporting climate change initiatives in the region. A cross-section of status reports on climate change and biofuels were presented from a number of countries as outlined in box 2:
Key Issues
The region’s economy is still largely dependent on agriculture and natural resources, which made vulnerability and adaptation to climate change issues of great importance. It was re-affirmed that already the region is under pressure from various non-climatic factors and this is likely to be exacerbated by future climate change. In addition, evidence shows that the region’s climate is more variable, and extreme weather events are expected to be more frequent and severe. Floods and droughts are increasing in frequency and magnitude and vulnerability to these extreme events is differentiated by gender and disadvantaged groups such as the disabled and by age. This called for proper targeting of approaches when dealing with these different groups.

Given the different scenarios presented at the local levels, it was evident that climate change impacts have far-reaching adverse effects on efforts to foster sustainable development and attain the MDGs. Climate change may in particular jeopardize the relatively low economic growth of the countries given the recent global economic crisis. The impacts of climate change at the community levels were noticeable across different countries through for example changes in seasons, reduced productivity of land, reduced water availability and increased pest and diseases incidences.
**Gaps and challenges**

It was highlighted that despite the countries being signatories to the international conventions, there had been very low resources trickling down to the lower communities as earlier agreed and stated in the treaties on climate change issues. Global commitments on assisting less developed countries have not been realized at country levels. While at various national levels, there were various climate change frameworks and environmental legislation, these were weak and lacked implementation. For example, some countries have drafted their National Action Plans, Green House Gas Inventories (GHG), Initial National Communications and Second National Communications. Despite such landmarks, these have had minimal impact in mitigating and reducing the impacts of climate change.

In several countries, there was noticeable absence of climate change strategies in place which rendered actions inadequate due to the limiting policy frameworks. There was also noticeable inadequacy in localized skills in climate change data collection and analysis as well as its communication or dissemination. It was eminent from the presentations that a body of indigenous/traditional knowledge exists within the region that should be enhanced to support community adaptation. In addition, tackling climate change challenges entailed addressing underlying vulnerabilities across many communities in the region.

**Opportunities**

The participants expressed the need for climate change to be mainstreamed into most of the poverty reduction strategies. This would allow the integration of climate change into national level and district level planning. The delegates agreed that there was a need of a platform to have climate change information well organized for ease of interpretation and eventual utilization. Such initiatives would give the stakeholders a common understanding of some of the terminologies used in the climate change field. However; these investments needed adequate financial and human resources.
4. CLIMATE CHANGE ADAPTATION STRATEGIES: ENERGY ISSUES

The session provided a platform for discussing examples of climate change adaptation strategies in the energy sector. The presentations (see box 3) provoked a lot of discussions and debates on the politics, processes and policy environment currently in existence in the region.

Box 3: Presentations on Climate Change Adaptation Strategies: Energy Issues

- The Status of Biofuels Development in Swaziland: Sam Dlamini
- The status of Biofuels Development in Zambia: John C. Musanya
- Biofuels in Tanzania: Current Status, Opportunities and Challenges: Anthony Mshandete
- Impacts of Biofuels on Rural Livelihood: A Case Study of Mutoko District of Zimbabwe: Jephias Gwamuri
- Biofuels for Zambia – Threats and Opportunities: Marriot Nyangu

Key Issues

It was evident from the presentations that biomass still contributed a large percentage of the energy sources of over 60% for the majority of the rural population in the region. The energy sector in the region predominantly depends on the exploitation of natural resources for industrial and domestic use. On one hand, the climate change impacts in the energy sector have been profound. While on the other, most of the energy sources contribute to global warming through GHG emissions. Other alternative energy sources in the region have included: wind energy, biogas, and bush encroachment to electricity, biofuels, petroleum, coal, solar energy and hydro power.

The region offers a suitable environment for production of biofuels despite the relatively arid climate. Thus the region is faced with complex tradeoffs between production for biofuels or for food security. Some of the main crops that have been grown for use as feedstock for biofuels have been
sugar cane, sweet sorghum, cassava for ethanol and Jatropha and oil palm for biodiesel. Large portions of land have been cleared to give way for biofuel production. One of the drivers for the growth in the trade has been due to the relatively large availability of land and the cheap labour resource compared to the developed north and the high global price of crude oil averaging at about US$ 80 per barrel.

There has also been a great need of improving energy security (e.g. reducing oil imports and foreign exchange savings); improve livelihoods; introduction of alternative cash crops (small-scale farmers and large scale), employment and income opportunities through promotion of rural development as new rural industries are created. It was equally noted that this increased demand could have something to do with the increased global demand for the biofuels as well with biodiesel and bioethanol expected to be 25 and 125 billion litres respectively by 2017. This is evidenced by the relatively rapid increase in the international companies that are trying to penetrate the region’s market. For example in Tanzania there has been a noticeable increase of up to 40 multinational companies and investors involved in biofuels.

**Gaps and challenges**

Despite the increased activity and demand, the presentations indicated that biofuels development was still in its infancy stages within the region. The policy situation surrounding the biofuels sector is still unclear thus prone to exploitation from external interests. The policies currently supporting biofuel production are those from the energy and agriculture sectors. As such, they are neither comprehensive nor adequate to support the biofuels industry particularly among small scale farmers. For example, Swaziland is in the process of developing a National Biofuels Development Strategy and Action Plan that will culminate in a National Biofuels Authority. This should inform the government of Swaziland on mechanisms for safeguarding the country’s food security concerns.

There are challenges around information sharing, increased land grabbing due to increased growing of biofuels, uncoordinated and unregulated project implementation, inadequate research and feedback to the communities as
well as the lack of clarity on whether biofuels are able to assist farmers to earn incomes as well as improve their livelihoods. The lack of a consistent socio-economic (and risk assessment) analysis of the benefits of biofuels in relation to other livelihood options also presents a major challenge in informing the public and policy makers. However, there was consensus that opportunities do exist for the biofuels and alternative energy development although this requires improved and robust risk assessments of the benefits to ensure that benefits outweigh any ecological, economic and social costs.

Opportunities
Data on alternative energy sources is needed at the national and regional levels for effective decision making. Participants agreed that various alternative energy sources were a necessary effort towards adaptation to climate change. These sources could be solar and wind energy which is also abundant within the region. Participants expressed the critical need for greater involvement of the regional bodies such as SADC and the Common Market for Eastern and Southern Africa in supporting national institutions in the biofuels industry.

5. CLIMATE CHANGE ADAPTATION STRATEGIES: ADAPTIVE MANAGEMENT

This session looked at adaptation strategies to climate change with an adaptive management lens. It provided the delegates with various integrated technologies that farmers are using to adapt to climate change. The titles of presentations and the respective presenters are shown in box 4.

Box 4 : Presentations on Climate Change Adaptation Strategies: Adaptive Management

• Adaptations to Climate Change and Variability among Smallholders Farmers in Tanzania: Stephen Nindi
• Climate Trends and Farmers Perspectives to Climate Change in selected Districts of Zimbabwe: Patrick Kasasa
• Optimizing Rainfed Agriculture as a climate change adaptation strategy in southeast Zimbabwe: Leonard Unganai
Key Issues
The presentations re-emphasized the problems and challenges caused by the effects of climate change. At community levels, these ranged from breaking up of families, loss of income generating capacity, sale of livelihood assets, widespread hunger, migrations and many others. For example, science (IPCC, 2007) estimates agriculture yield losses of 20-50% by 2050 across Africa. However, it was also noted that various smallholder farmers are using various adaptation strategies. As such, such initiatives needed to be documented in-order to identify what works, why and how it works. Given that adaptation is context specific, it was important that national initiatives consider the needs and knowledge of the local populations. To this end, participatory approaches should be utilized so that the innovations are sustainable since the solutions generated address the felt needs of the people who are at the heart of the climate change problem.

For example in some parts of Zimbabwe, Participatory Plant Breeding and Participatory Varietal Selection were being practiced and the innovation had taken root within the communities where seed banks were managed by the communities themselves without relying heavily on outside interventions. Initiatives on alleviating water stress among farmers in Chiredzi, Zimbabwe included infield rainwater harvesting and promotion of tillage practices such as tied ridges and furrows, deep plough tied furrows and basins. These water and soil management practices are integrated with the diversification of the crop mix, variety selection, linkages with markets and technical institutions. The participation of farmers in identifying the causes for poor yields was an important element in supporting community adaptation.

- Using livestock to reverse desertification/climate change: Africa Centre for Holistic Management Experience: Ntombizakhe Mpofu
- Organic and Conservation Husbandry a Strategy for Climate Change Resilience: Noah Zimba
- Building Local Community Adaptive Capacity to Climate Change: The Case of Pangani River Basin Project in Tanzania: Savinus Kessy
- Climate change adaptation strategies in Chiawa community in Lower Zambezi, Zambia, Excellent Hachileka (International Conservation Union)
Contrary to the popular belief that livestock contributes to desertification; it was presented that livestock (browsers and grazers) can actually improve land degradation. This is because research has shown that overgrazing is not a function of a number of livestock, rather, it is a function of the time plants are exposed to animals. Once best management principles are explored soils could be harnessed. This could start right from the selection and breeding of those animals that survive better during the adverse climatic conditions to the livestock management practices like herding of livestock instead of the free ranging management. Reversing climate change involves managing the relationship between soil, animals and plants – a relationship that has existed for years. The research presented by Ntombizakhe Mpofu made revelations that through proper management of this balance, there had been reclamation of gullies and previously abandoned drylands.

And since land degradation is directly linked with climate change, there is a high likelihood of reversal of climate change. Using the available technological and local knowledge data, seasons are planned well in advance. The innovation calls for herding together in large bunched up herds so as to harness the power of their hooves that break up the ground for water and air to penetrate once it rains. In the process, livestock trample down on the old grass so that soil is covered and less prone to drying effects of the sun and the wind. Their dung and urine help fertilise the hoof-prepared soil. Their grazing, well timed to prevent overgrazing, keeps perennial grasses healthy, minimising the need to burn them and expose soil. With this kind of information and knowledge available on the continent since the 1970s, there is a need for its dissemination to save the region’s river systems, reverse desertification and climate change. This is based on the fact that the fate of carbon and water is tied to the soil and organic matter and since bare soils release carbon and water which when released contributes to climate change.

One of the key agriculture practices presented included conservation agriculture whose major principle rests on the need for little disturbance of the soil structure and need to conserve as much water and nutrients in the soil. This has been widely practiced in the region and yields have been tremendous and its potential for reducing the impacts of climate change was highlighted.
Gaps and challenges
The challenge around capacity building were noted. This calls for a need in investing in capacity at the lower level communities over a longer period of time so as to enable building of stronger institutions relevant for addressing climate change challenges. It was equally noticed that some of the innovations require both the skills and money. These in most cases are in short supply at the lower community levels. Through civil society, some of these gaps can be addressed at a faster pace than the public sectors. The observation that most assessments within the region were rather on a very large scale, present in its own form some challenge for dissemination and uptake and lower levels.

Opportunities
Delegates further agreed that with the many strategies that had been presented and discussed, there was a need for their incorporation into project planning and management instead of being add-ons on current programmes. This would rather be better approached through mainstreaming climate change into the development programmes. Given the community’s involvement it is always imperative that information is shared between the community and the scientists or practitioners so that there is increased trust amongst the stakeholders. And since the key to shifting from short-term coping towards adaptation lies in reducing community vulnerability and requires that underlying causes of vulnerability are addressed, there is a need to invest in vulnerability assessments using already tested tools within the region. There is also a general need for strengthening social networks and capital for efficient adaptation to climate change.

6. SCIENCE AND TECHNOLOGY
In this session, emphasis was given to the role of science and technology towards adaptation to climate change. The titles of presentations and the respective presenters are shown in box 5.
Key Issues
The presentations noted that despite the benefits of science, it was important to approach science with a balanced view. While scientific knowledge and information is necessary for understanding and addressing the challenges of climate change, the use of traditional knowledge was also important. In this regard, national governments need to invest more financial resources in support of the interface between science and traditional knowledge. An area of investigation identified was that of soil management research. One presentation indicated that soils are second to oceans in being the highest carbon sink. Hence, soil information services can act as platforms for providing reliable soil health information to farming communities, extension services, development workers and land use planners. Such services would particularly be of benefit to small scale farmers because soil information is important for increasing food production, reducing hunger and ecosystem degradation which are key factors towards successful adaptation to and mitigation against climate change.

Gaps and Challenges
Recognition for the global support towards provision of data was noted, however, since this needed to be context specific, there was a need to have accurate localized estimates to ensure that decisions made are reflective of the situation on the ground.

Box 5: Presentations on Science and Technology

- Integrating technological and indigenous knowledge systems for climate change adaptation and mitigation in Southern Africa: Erold Naomeb
- Science and Technology and Innovation system: enhancing adaptation to Climate Change for Developing countries: Moses Marilo
- Soil information for adaptation to climate change in agricultural land use systems: Brian Mhango
- Estimation of Climate Change and Adaptation Strategies Using Water, Soil and Honey as Sampling Media: examples from Namibia: Benjamin Mapani
There are a wide range of scientifically based technologies (among these is breeding for tolerant crop varieties) available for mitigation and adaptation to climate change. These are in various sectors including energy, transport, construction, agriculture, forestry, industry and waste management. Delegates concurred that the data generated should be central in informing policy and regulatory interventions. Not only do we need technologies that work but also strong political, social and civil commitments are collectively needed as essential instruments for reducing climate change impacts. The presentations also highlighted that the effectiveness of technology transfer depends on the suitability of transferred technologies to the socio-economic and cultural context of the recipients, considering development, equity and sustainability issues. This calls for participatory techniques and platforms to be able to take the information and innovations forward.

Innovations that are evidence based have been shown to be more resilient than those that have lacked people participation. For example, technologies on soil moisture and water management, modification of irrigation techniques; adoption of water-efficient technologies to ‘harvest’ water, conserve soil moisture; improved water management to prevent erosion and nutrient leaching; modification of crop calendars, timing of cropping activities; integration of the crop, livestock, forestry and fishery sectors at farm levels; implementation of seasonal climate forecasting can greatly enhance the communities’ adaptive capacities. Although lots of work has been done at the international level in trying to assist the region, there is a continued need of sustained research that is internally funded within the region using local data models. Noting that this is expensive and takes time, mechanisms have to be put in place to address this gap.

**Opportunities**

Given the nature of the institutions that have been continuously developing within the region, there is great opportunity for them not to re-event the wheel but adopt and adapt some of the already available methodologies in the region. This serves as a basis for sustainably equipping local scientists with skills to inform decision making processes.
Indigenous traditional knowledge has been widely practiced throughout generations. As such, the local populations in this region, through their indigenous knowledge systems, have developed and implemented extensive mitigation and adaptation strategies that have enabled them reduce their vulnerability to past climate variability and change. However, this knowledge is rarely taken into consideration in the design and implementation of modern mitigation and adaptation strategies.

7. AWARENESS, COMMUNICATION AND NETWORKING

Awareness and communication of climate change across levels and scales although undermined, was flagged as an important tool towards mitigating and adapting to climate change. This session consisted of two presentations of case studies done in Tanzania, Mozambique, Swaziland and Zambia. The titles of presentations and the respective presenters are shown in box 6.

Box 6: Presentations on awareness, communication and networking climate change

- Communicating Climate Change Research Findings: Linking knowledge with action: Neema Tindamayire
- Media Coverage of Climate Change in SADC Region: The Case of Mozambique, Swaziland and Zambia: Parkie Mbozi

Key Issues

It was outlined that despite the evidence of climate change in the SADC region, the communication of this scientific information for policy making processes is currently poor. This could be attributable to:

- Low levels of scientific understanding by policy makers,
- Limited openness by politicians to using Science Technology and information,
- Limited dissemination of research findings, and
- Lack of institutional channels for incorporation of science and technology and information into policy.
This scenario called for more open communication amongst the different players, such as researchers, policy makers and the beneficiary communities. To bridge this communication gap, strengthening information and communication platforms on climate change at various levels will provide support to current and future mitigation and adaptation efforts.

Presentations highlighted the inadequate understanding of climate change at various levels as a major hindrance to adaptation. For example, few people linked climate change to human activity, including their own. In addition, there was low information about and access to technology for adapting to climate change.

The fact that climate change effects are long term and will impact many sectors of the economy and hence reduce country’s development, there is a need to strengthen communication channels (link knowledge with action) or raising awareness on climate change issues to different stakeholders. The tools for communication were suggested to range from Information and Communication Technologies Portal, Policy briefs, Print Media, Broadcast media, Mobile technology, conferences, Group discussions, School curricula and infotainment. To this end, deliberate collaboration and networking between researchers, policy makers and general were essential for improving awareness and communication of climate change.

**Gaps and challenges**

Although there had been tremendous efforts towards coverage of climate change issues by private media, there were still challenges that hindered dissemination of proper information. Firstly, there were still fewer institutions that were offering skilled training in communication for development and secondly the many media houses lacked substance in climate change information or environmental information in general. In addition, many media houses faced financial constraints to cater for the ever increasing needs in the society.

Awareness and communication among disadvantaged members of the community such as disabled members also remain a challenge in the region.
This calls for proper audience analysis and segmentation so that information reaches the proper targeted audience.

Delegates agreed that communication and awareness concerns should be incorporated during planning stages of climate change for interventions and programmes including budgetary considerations.

**Opportunities**

With the liberalization of most of the airwaves within the region, there is a larger population that can be reached with climate change awareness information. The liberalization of education in many countries has meant that institutions within the region are developing many programmes to train well qualified journalists who can be able to articulate the issues quiet well, despite the challenge of mainstreaming the environmental information in their messages.

Communication with communities should aim to foster the understanding of increasing climatic change effects as a long-term, rather than a temporary problem. This encourages use of already existing mechanisms/structures rather than creating new ones. In various communities, local-level grassroots organizations, such as self-help groups, village organizations, village watershed committees and forestry committees, among others are critical.

8. **LEGAL IMPLICATIONS AND POLICIES**

The session outlined the discourse between human rights and climate change. The titles of presentations and the respective presenters are shown in box 7.

**Box 7: Presentations on Legal Implications and Policies**

- Legal Aspects of Mitigation and Adaptation Strategies to Climate Change in Namibia from a Human rights Perspective: Oliver Ruppel
- Climate Change and Agricultural Policy in Malawi: Process, Constraints and Outcome: Tamani Nkhono-Mvula
Key Issues
The window of opportunity that exists is that all governments within the region do have constitutions that provide for the protection of human and property rights. Moreover, countries have statutory laws and Acts of Parliament as well as obligations laid out in international agreements which provide for the protection and preservation of the environment. At the regional level, environmental protocols and human rights protocols also do exist. This outlook shows that environmental rights are fundamental rights. For example, it was presented that in order to adequately address the potential negative effects of climate change for Namibia’s population; environmental law and human rights law have to be applied collectively.

Distinct perspectives on the link between climate change and human rights entail very different approaches to the relevant human rights obligations under international law; each reveals the current limitations on the ability of the law to address the human and social impacts of climate change. However, these observations should not obscure the potential of international law to contribute to this context, nor the ways in which human rights can add value to the ongoing search for solutions to the myriad challenges of climate change and foster change. It is clear that a successful strategy to persuade various constituencies of the link between these two critical issues will require concerted, coordinated action and multi-disciplinary efforts at all levels. Preventing both further environmental degradation and threats to human rights resulting from climate change will rely on harnessing the moral, political, institutional, and legal potential of human rights discourse.

Gaps and challenges
As a prerequisite, there is urgent need for transparent planning by putting
human rights-based development at the centre of what people do so as to ensure equitable use of natural resources. To ensure that there is participation across the board, it was highlighted that since policy is more of a political process and given that most of the policies that were developed by the countries in the region were those in the 1960s which tended to be silent on climate change, there was an urgent need of engaging the politicians at all levels of governance. Through the involvement of the politicians, climate change would then afford to change from being merely an environmental issue to being a socio-economic developmental issue and cross-cutting in nature hence being able to attract adequate budgets from the policy makers within the region. Such an undertaking requires strengthening of non-state actors across the region.

**Opportunities**

Government interventions are inevitable since the constitutions of all the countries in the region provide for the protection of fundamental human rights. Due to the close interrelationships that exist between climate change, human vulnerabilities and the law, there is need to consider cross-cutting issues for the holistic management of climate change. It is worth noting that most of these cross-cutting issues are those areas where there are inadequate capacities within Africa as a whole and the region specifically. This makes them some of the highest research priorities for attention both by governments as well as non-state actors like RAEIN-Africa. The fact that some countries in the region are supporting debate on climate change and privatizing media houses provides an opportunity for more public awareness. Again the existence of civil society networks and Parliamentary committees responsible for agriculture and natural resources in most countries is an opportunity for interaction and debates.
9. INNOVATION SYSTEMS FOR CLIMATE CHANGE ADAPTATION

The session was based on the premise that adaptation actions, which are often specific to local conditions, will be necessary to reduce vulnerability to climate change impacts. The titles of presentations and the respective presenters are shown in box 8.

Box 8: Presentations on Innovation Systems for Climate Change Adaptation

- An Innovation Systems Approach to Mainstreaming the Energy-Gender-Poverty Nexus in Climate Change Adaptation Strategies: Kumbirai Musiyiwa
- Innovation Systems to Support Climate Change Copying Mechanisms for Communities in Namibia: Benedict Libanda
- Developing leadership for climate change: An integral learning and approach to management, adaptation and mitigation: Gereon Klein
- Facilitation for change: Enabling communities and field facilitators to develop adaptive capacity for dealing with climate change impacts: Lessons from 20 years practice in southern Africa: Kuda Mirwira

Key Issues

A number of presentations used the integrated learning approach to dealing with the issues of climate change. This approach is designed for practitioners who are faced with the challenge of providing leadership for climate change in government, political level, private sector and/or civil society stakeholders. The approaches main principle is ‘making change happen’, which is grounded on the action learning concept that builds on the practitioners’ real life experiences, thus enabling them to gradually change their situation for the better. It is also based on the understanding that people need to appreciate their bad situations. Thereafter, they are then facilitated to move out of that situation by stimulating fundamental change in individuals, communities and organizations and strengthening communities ‘adaptive capacity. This requires facilitation competency and capacities that are built on indigenous knowledge requiring adequate time and farmers participation to enable them adjust to suit specific conditions leading to sustainable innovation platforms.
This could take the form of a participatory extension approach that could follow the following cycle;

- Social mobilization
- Action planning
- Experimentation while implementing
- Sharing Experience and
- Self Evaluation

The approach aims at enhancing people’s adaptive capacities and addresses all factors including social (behaviour and practice), economic (markets and resource mobilisation), ecological and climate change (natural resource conservation) and organisational (leadership) matters.

Gaps and challenges
Presentations showed that gender and energy are at the core of the effects of climate change. The issues that need to be looked at in this nexus include; wealth, water, food Security, information access, resource ownership, energy and GHG emissions. There equally exists lack of adequate appreciation and use of indigenous knowledge as a basis for adaptive capacity amongst practitioners that could be a basis for further innovations. Despite the availability of various innovations, the overriding challenge that exists in implementing most of them lies in the complexity of the environment under which communities operate.

Opportunities
Many participants in the meeting argued that climate change equally presents some opportunities especially with Agriculture, aquaculture and some other river/lake side activities which serve as a window for farmers to innovate around these occurrences. The communities themselves are the most affected by the effects of climate change and they need to make choices. The options that are presented to these communities have been practiced elsewhere. Hence the need to document these practices and share them widely with the communities through gradual facilitation.
10. IN-DEPTH GROUP WORK AND WAY FORWARD

Participants were allocated to six working group sessions, each of which built on outcomes of the previous presentation sessions.

Group 1: Chair-Kessy Savinus

How to achieve effective community-based adaptation in southern Africa

- What are the critical issues to address?
- What are the appropriate ways to address or enhance the adaptive capacities of communities?

What is adaptation?
Adaptation consists of two major components: the ability to adjust to change in context as a result of climate change hazards. The ability to exploit opportunities that come from climate change hazards e.g. floods, drought.

Critical issues to address

- Lack of a common understanding of climate change between the communities and the actors.
- Issues of cultures and beliefs need to be looked at since these issues exacerbate vulnerabilities, e.g. when one has not eaten maize meal, then they have not eaten food.
- Poverty also exacerbates vulnerability which may have retarding effects on adaptation strategies.
- Lack of good governance. This involves lack of transparent policies, participation and accountability in decision making. Imposing issues on communities rather than allowing them to decide on critical issues that affect them.
- Lack of resources: This hinders adaptive capacities of the local communities.
- Weak institutions and policies. Both private and government sectors are involved, e.g. Lack of financial resources, technical know-how hinder the adoption of adaptive strategies
- Lack of information sharing among technocrats and local communities.
Group 2: Chair-Percy Makombe

Strengthening policy and advocacy issues on climate change
- Identification and suggestion of opportunities that are available at various levels to lobby and advocate Climate Change and Management Issues

<table>
<thead>
<tr>
<th>National Actors</th>
<th>Community Actors</th>
<th>Bilateral</th>
<th>Sub-Regional/Regional</th>
<th>Continental</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sectoral committees, Parliamentary portfolio committees, Civil Society Organisations, Faith Based Organisations, SADC, NEPAD, and CAADP National Committees, Academic Institutions, National Departments</td>
<td>• Traditional Leadership, farmer groups, CBOs,</td>
<td>• Joint Permanent Commissions, Donor Country Arrangements</td>
<td>• Accords eg: Trans Frontier, Zambezi River Authority, Protocols eg: COMESA, SADC, Annual Civil Society Forum, Regional Professional bodies</td>
<td>• Continental Bodies eg AU</td>
<td>• International Bodies/Protocols</td>
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<td></td>
<td>• Heads of state Committee on CC</td>
<td>• UN agencies and funds</td>
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<td>• Ministerial Conference on met, (12/16 April 2010)</td>
<td>• WMO</td>
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<td>• AU Agencies and Commissions (NEPAD/CAADP, etc)</td>
<td>• IUCN</td>
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<td>• AU Programmes</td>
<td>• WWF</td>
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<td>• AMCEN</td>
<td>• CCIAR</td>
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<td>• Global scientific Research Institutions</td>
<td>• Animal Health Organization</td>
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</table>

Implementation mechanisms
Members of the group indicated that this has to a consultative process – right from this meeting where RAEIN-Africa should initiate the process through in-country consultations of key persons and later on wider public debates and discussions.
Group 3: Chair - Patricia Masanganise
Communication awareness and access to information
- What are the issues with regards to Climate Change awareness and access to information at different levels?
- Suggesting ways for enhancing access to information at different levels and participation of all stakeholders in the Climate Change discourse.

<table>
<thead>
<tr>
<th>LEVELS</th>
<th>ISSUES</th>
<th>SUGGESTED SOLUTIONS/TOOLS</th>
</tr>
</thead>
</table>
| Micro Communities; traditional leaders Farmer Organisations | • Climate variability and associated impacts  
• Learning & sharing the best practices | Participatory using field days, drama plays, leaflets, community dialogues, radio programmes, ICTs, Extension materials, video documentaries, listening clubs, meetings/ workshops, conferences, etc |
| Local Support Organisations -church leaders, FBO, CBOs          | • Climate variability and associated impacts  
• Learning & sharing the best practices | Exchange forums, leaflets, community dialogues, radio programmes, ICT’s, Extension materials, video documentaries, listening clubs, newsletters, etc |
| Meso Development Facilitators, NGOs, Public sector               | • Information overload & lack of knowledge                                         | Scientific journals, networks, TV, radio, websites, conferences, meetings/ workshops, Video documentaries, etc |
Issues with regards to climate change awareness & access to information at different levels

<table>
<thead>
<tr>
<th>Macro</th>
<th>Lack simplified information, Lack of political will, Lack of understanding that requires multi-disciplinary approach</th>
<th>Policy briefs, Scientific journals, networks, TV, radio, websites, conferences, meetings/ workshops, Video documentaries,</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy makers</td>
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<td>Policy co-ordination units</td>
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<td>Implementation facilitators</td>
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<td>NGOs</td>
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<tr>
<td>Jouarnalist</td>
<td>Lack of clear information, Lack of understanding, Sellable information</td>
<td>Scientific journals, networks, TV, radio, websites, conferences, meetings/ workshops, Video documentaries</td>
</tr>
<tr>
<td>Regional &amp; Int. Parliament</td>
<td>Politics &amp; power, Vested political will</td>
<td>Scientific journals, networks, TV, radio, websites, conferences, meetings/ workshops, Video documentaries, simplified reports</td>
</tr>
<tr>
<td>Scientists &amp; Researchers, Academia</td>
<td>Scientific language need to be simplified. Disconnected, secretive, Lack of collaboration, Lack of communication skills.</td>
<td>Scientific journals, networks, TV, radio, websites, conferences, meetings/ workshops, Video documentaries, simplified reports</td>
</tr>
<tr>
<td>General Public</td>
<td>Lack of information, lack of Platforms to address them.</td>
<td>Print &amp; electronic media, Billboards posters</td>
</tr>
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</table>
Appropriate ways to address or enhance the adaptive capacities of communities

- There is need to build a relationship between the local community and actors aimed at creating a common understanding of the prevailing situation e.g. vulnerabilities, needs.
- There is need to understand the underlying causes of their vulnerability
- There is need to understand the power relationship. We have the cultural power, economic power and political power.
- There is need to ensure that both the local communities and actors understand issues of land tenure. (State land and customary land) There is needed to get views from the communities as to create a common goal that can ensure the adoption and implementation of adaptation strategies, e.g. in cases when there are floods in an area the government may encourage people to relocate the alternative places. Communities can also make use of the floods, for example, by enhancing fishing activities.

Group 4: Chair- Isaac Mapaure

Strengthening mitigation and adaptation strategies through science and technologies

- What are the critical issues to address?
- How do we ensure that Science and Technology is used to address climate change and variability?

The critical issues identified were:

- Limited local level scientific data
  - Biotechnology
  - Precipitation
  - Temperature
  - Changes in species composition
- Example: Zimbabwe has good monthly data but no daily data
- Limited access to available information
- Inadequate resources to research and develop relevant technologies to respond to climate change.
- Limited sharing of developed technologies
- Inadequate use of local indigenous knowledge
Mechanisms to ensure use of Science and Technology were identified as:

- Carry out multi, trans-disciplinary participatory action research to develop and adopt relevant technologies - produce relevant technologies that address people’s needs.
- Create platforms for innovation
- Attach incentives to adopted adaptive or mitigation technologies through Government Policies e.g. through application of tax exemptions
- Packaging information to suit the audience and make it accessible to implementations (move from technical know-how to technical show-how)
- Keep It Simple Stupid
- Invest in institutional development e.g. schools having small weather stations to collect weather data that feeds into the larger meteorological stations in addition to them being a learning tool.
- Strengthen ground level data collection e.g. uses extension staff / farmers to collect weather data such as precipitation data, temperature. Will bring to the fore to the farmers - the need for such information.
- Improve process efficiency, e.g. for power generation from coal (cost benefit for adoption)
- Establishment of a regional climate change research, repository facility that ALL countries in SADC can feed into or tap into.

Group 5: Chair- Gerson Klein
Innovation systems in climate change adaptation. Status, challenges, critical gaps and opportunities
- How can the innovation system approach be mainstreamed in managing climate variability and change?

The group presented Innovation Systems as a process with interrelationships of agents / organisations that involves (a) generation, (b) diffusion and (c) Utilisation of both knowledge and Technology. Each of these were looked at in terms of the current status, the challenges/gaps and the opportunities available that could be utilized for the benefit of the climate change discourse.
**Generation**

*Status:*
- Indigenous knowledge Systems
- Research Institutions / Universities
- Platforms at different levels (Workshops, Networking, Village gatherings)

*Challenges / gaps:*
- Integration
- Finance
- Access to Indigenous knowledge Systems (traditional barriers)
- Access to scientific knowledge / research (output)
- Relevance of the information / knowledge

*Opportunities:*
- Huge pool of knowledge / untapped knowledge of the people
- catch the relevance of the subject
- Discomfort / pressure of crisis
- Interconnectivity / networking via cell phone and internet
- Demand of knowledge

**Diffusion**

*Status:*
- Publications, media, workshops, conferences, service providers (NGOs, public organisations), communities, exposure (look and learn)
- Look and learn (exposure visits)
- Demonstration fairs (displays)
- Exchange of knowledge and technologies
- Sharing of Experiences
- Facilitation of process

*Challenges / gaps:*
- Dumped exogenous technologies
- Perceptions / mind set
- Prioritisation
- Packaging
- Financing
Opportunities
• Media, platform
• Information and communication technologies
• Personal experiences, community based innovators
• Extension systems

Utilisation
Status:
• Poor adoption and utilisation of innovation (knowledge and technologies)

Challenges / gaps:
• To many compartments, to much fragmentation
• Lack of ownership
• Lack of experienced relevance

Opportunities:
• To go with the needs
• Community Needs and
• Science

Group 6: Chair-Kuda Murwira

• Is there a Role for RAEIN-Africa in Climate Change Issues in the Region?
• Suggestion of ways of how this could be done if any?

The group made discussions about the topic and equally agreed that RAEIN-Africa had a role to play within the region as far as climate change is concerned. Before discussing how this could be done, they were able synthesize what the issues were to be tackled.

Pertaining Issues
• Narrow view of adaptation - limited to food security;
• Limited coverage of mitigation aspects in climate change debate in the region;
• Knowledge gap amongst policy makers in the region to influence global policy debate on climate change;
• RAEIN-Africa needs to position itself for COP processes especially COP 17 in the Republic of South Africa; and
• Challenges in climate change awareness, education and training.

Mechanisms of how to address the issues
• Publish Web based magazine which is accredited – could feed into IPCC Reports;
• Use case studies – publish them in journals and use as evidence to influence decisions;
• Act as forum for climate change information sharing;
• Facilitate information sharing at national level which could eventually feed into regional;
• Broadening national working groups to be more inclusive by including climate change issues;
• Partnering with existing regional structures or institutions who are already working on climate change e.g. Food, Agriculture and Natural Resources Policy Analysis Network; and
• Lobby SADC to include climate change issues on its agenda (to be proactive).

11. CLOSING REMARKS

Closing Statement from the Regional Director, RAEIN-Africa

Ms Doreen Shumba-Mnyulwa, Regional Director, RAEIN-Africa, in her closing remarks hoped that all participants had gained knowledge on climate change adaptation strategies in the SADC region and found the interactions during the conference useful too. On behalf of RAEIN-Africa she expressed appreciation to each and every one present on the time taken during the preparation of the conference. Ms Shumba-Mnyulwa noted that the response to the call for papers was overwhelming and great, thus explained the many presentations given within very short time without much of a break.
She further added that climate change is a complex issue which is exemplified by the number and diversity in professionalism of those who attended the conference. This is just a foundation of the future networking and hoped that the networking activity will continue. RAEIN-Africa will continue to associate with partners at the National level especially through the 9 nodes.

As a way forward, Ms Shumba Mnyulwa pledged that Secretariat would follow up on the issues identified in this conference and the proceedings will be synthesized and documented for wide circulation to all participants and those who were not able to attend the conference. She thanked the facilitator of this conference, all presenters and colleagues at the RAEIN-Africa Secretariat for supporting and organizing this successful activity and also acknowledged the donor for the resources availed to make the conference a success. Lastly she wished all a safe journey back home and urged them to keep in touch.

**Closing Remarks from RAEIN-Africa Board Member**

Dr Phumzile Dlamini, RAEIN-Africa Board member thanked participants for their contribution in making the conference a success. Though the conference had come to an end it was a new beginning of further networking and work to come. She pointed out that the conference had been participatory enough and therefore, the outcomes of the conference should be owned by many people present and those who could not make it. There was need to start with what has been generated to get to where we want to be. She emphasized the need for collaborative research if we are to get to greater heights in the fight against climate change effects. No single individual or organization can do it alone.

She expressed appreciation to RAEIN-Africa’s efforts in organizing the conference and a job well done.

With those few remarks, she officially closed the conference and wished all a safe journey back to their various destinations.
REFERENCES


# ANNEX 1: CONFERENCE PROGRAMME

Birchwood Hotel and OR Tambo Conference Centre  
(Viewpoint Road, Bartlett, Boksburg), Johannesburg, South Africa  
23 – 25 March 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 – 08:20</td>
<td>Registration, Aune David, RAEIN-Africa Secretariat</td>
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<tr>
<td>08:20 – 08:30</td>
<td>Welcoming and introduction, Sithabiso Gandure, Conference Facilitator</td>
</tr>
<tr>
<td>08:30 – 08:40</td>
<td>Workshop expectations, Benedict Libanda, member of the organising committee of the conference</td>
</tr>
<tr>
<td>08:40 – 09:00</td>
<td>An overview of the programme, Doreen Mnyulwa, Regional Director, RAEIN-Africa</td>
</tr>
<tr>
<td>09:00 – 09:20</td>
<td>Regional and international issues (Frameworks and Policies): Copenhagen conference on climate change decisions (Accord) made and their implications for the Southern Africa, Percy Makombe, Programme Manager, Economic Justice Network</td>
</tr>
<tr>
<td>09:20 – 09:35</td>
<td>Official opening of the workshop, NEPAD</td>
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<tr>
<td>09:35 – 10:30</td>
<td>GROUP PHOTOGRAPH AND TEA BREAK</td>
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</table>

**SESSION 2: STATUS REPORTS OF CLIMATE CHANGE IN SOUTHERN AFRICA**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>10:30 – 10:50</td>
<td>Country Status Report on Climate Change and Challenges of Livelihood adaptation in Nsanje District of Malawi, William Chadza, Malawi</td>
</tr>
<tr>
<td>10:50 – 11:10</td>
<td>Climate Change and Challenges of Livelihood Adaptation in Nsanje District of Malawi, Edson Musopole, Malawi</td>
</tr>
<tr>
<td>11:10 – 11:30</td>
<td>Country Status Report on Climate Change in Botswana, Dorcas Ntiki Masis, Botswana</td>
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<tr>
<td>11:30 – 11:50</td>
<td>Situational Analysis to Climate Change Adaptation in Namibia, Paul Nteza, Namibia</td>
</tr>
<tr>
<td>11:50 – 12:10</td>
<td>Impacts of Climate Change on Development in Ohangwena Region, Irene Nunes, DRFN, Namibia</td>
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<tr>
<td>12:10 – 12:30</td>
<td>Country Status Report on Climate Change in Zimbabwe, Mutsa Chasi, Zimbabwe</td>
</tr>
<tr>
<td>12:30 – 13:00</td>
<td>PLENARY</td>
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<tr>
<td>13:00 – 14:00</td>
<td>LUNCH</td>
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<tr>
<td>14:00 – 14:20</td>
<td>Research on Angola Institution for Improvement of Mitigation and Adaptation Options, Abias Huongo, Angola</td>
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36
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>14:20 – 14:40</td>
<td>Country status report on climate change in Swaziland, Seth Maphalala, Swaziland</td>
</tr>
<tr>
<td>14:40 – 15:00</td>
<td>The status of Biofuels Development in Zambia, John C. Musanya</td>
</tr>
<tr>
<td>15:00 – 15:15</td>
<td>PLENARY</td>
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<tr>
<td>15:15 – 15:20</td>
<td>TEA BREAK</td>
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<tr>
<td>14:40 – 15:00</td>
<td>The status of Biofuels Development in Zambia, John C. Musanya</td>
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<tr>
<td>15:00 – 15:15</td>
<td>PLENARY</td>
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<tr>
<td>15:15 – 15:20</td>
<td>TEA BREAK</td>
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**SESSION 3: CLIMATE CHANGE ADAPTATION STRATEGIES**

**3A: Energy Issues**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>15:20 – 15:40</td>
<td>Impacts of Biofuels on Rural Livelihood: A Case Study of Mutoko District of Zimbabwe, Jephias Gwamuri, Zimbabwe</td>
</tr>
<tr>
<td>15:40 – 16:10</td>
<td>The status of biofuel/bioenergy production in Malawi: Any hope for the small-scale farmers, Patson Nalivata, Malawi</td>
</tr>
<tr>
<td>16:10 – 16:30</td>
<td>Biofuels in Tanzania: Current Status, Opportunities and Challenges, Anthony Mshandete, Tanzania</td>
</tr>
<tr>
<td>16:30 – 17:00</td>
<td>PLENARY</td>
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</table>

**DAY TWO: Wednesday, 24 March 2010**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>08:20 – 08:25</td>
<td>Summary of Key issues from Day 1 by Paul Nteza and Dorothy Mulenga</td>
</tr>
<tr>
<td>08:55 – 09:15</td>
<td>Biofuels for Zambia – Threats and Opportunities, Marriot Nyangu, Zambia</td>
</tr>
<tr>
<td>09:15 – 09:35</td>
<td>Namibia alternative energy status, Anna Nguno, Namibia</td>
</tr>
<tr>
<td>09:35 – 09:55</td>
<td>PLENARY</td>
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<tr>
<td>09:55 – 10:10</td>
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**SESSION 3: CLIMATE CHANGE ADAPTATION STRATEGIES**

**3B: Adaptive Management**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>10:10 – 10:20</td>
<td>Adaptations to Climate Change and Variability among Smallholders Farmers in Tanzania, Stephen Nindi, Tanzania</td>
</tr>
<tr>
<td>10:20 – 10:40</td>
<td>Climate Trends and Farmers Perspectives to Climate Change in selected Districts of Zimbabwe, Patrick Kasasa, Zimbabwe</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Optimizing Rainfed Agriculture as a climate change adaptation strategy in southeast Zimbabwe, Leonard Unganai, Zimbabwe</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>Using livestock to reverse desertification/climate change: ACHM Experience, Ntombizakhe Mpofo, Zimbabwe</td>
</tr>
<tr>
<td>11:40 – 11:50</td>
<td>Building Local Community Adaptive Capacity to Climate Change: The Case of Pangani River Basin Project: Tanzania, Savinus Kessy, Tanzania</td>
</tr>
<tr>
<td>11:50 – 12:10</td>
<td>The Impacts of Climate Change, and Coping Strategies of Small Scale Farmers in Central and Southern Zambia, Richard Chintu, Zambia</td>
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</tbody>
</table>
### SESSION 3: CLIMATE CHANGE ADAPTATION STRATEGIES
3C: Science and Technology

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:10 – 12:30</td>
<td>Climate change adaptation strategies in Chiawa community in Lower Zambezi, Zambia, Excellent Hachileka (IUCN)</td>
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<tr>
<td>12:30 – 13:00</td>
<td>PLENARY</td>
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<tr>
<td>13:00 – 14:00</td>
<td>LUNCH</td>
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#### SESSION 3: CLIMATE CHANGE ADAPTATION STRATEGIES
3C: Science and Technology

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>14:00 – 14:20</td>
<td>Integrating technological and indigenous knowledge systems for climate change adaptation and mitigation, Erold Naomab, Namibia</td>
<td></td>
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<tr>
<td>14:20 – 14:40</td>
<td>Adapting to climate change related stresses through breeding of tolerant crop varieties, Moses Marilo, Malawi</td>
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<tr>
<td>14:40 – 15:00</td>
<td>Soil information for adaptation to climate change in agricultural land use systems, Brian Mhango, Namibia</td>
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<tr>
<td>15:00 – 15:15</td>
<td>Estimation of Climate Change and Adaptation Strategies Using Water, Soil and Honey as Sampling Media: examples from Namibia, Benjamin Mapani, Namibia</td>
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<tr>
<td>15:15 – 15:30</td>
<td>PLENARY</td>
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<td>15:30 – 15:40</td>
<td>TEA BREAK</td>
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</table>

### SESSION 4: AWARENESS, COMMUNICATION AND NETWORKING

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Location</th>
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<tbody>
<tr>
<td>15:40 – 16:00</td>
<td>Communicating Climate Change Research Findings: Linking knowledge with action, Neema Tindamayire</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Media Coverage of Climate Change in SADC Region: The Case of Mozambique, Swaziland and Zambia, Parkie Mbozi</td>
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<tr>
<td>16:20 – 16:55</td>
<td>PLENARY</td>
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<tr>
<td>16:55 – 17:00</td>
<td>Day two Evaluation</td>
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#### DAY THREE: Thursday, 25 March 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Location</th>
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<tbody>
<tr>
<td>08:00 – 08:05</td>
<td>Summary of Key issues from Day 2 by Paul Nteza and Dorothy Mulenga</td>
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</table>

### SESSION 5: LEGAL IMPLICATIONS AND POLICIES

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:05 – 08:20</td>
<td>Legal Aspects of Mitigation and Adaptation Strategies to Climate Change in Namibia from a Human rights Perspective, Oliver Ruppel, Namibia</td>
<td></td>
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<tr>
<td>08:20 – 08:35</td>
<td>Climate Change and Agricultural Policy in Malawi: Process, Constraints and Outcome. Tamani Nkhono-Mvula, Malawi</td>
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<tr>
<td>08:35 – 08:50</td>
<td>Status of Climate Change Policy in South Africa. Antoanetta Letsoala, South Africa</td>
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<tr>
<td>08:50 – 09:10</td>
<td>Understanding Key Success Factors for mainstreaming Adaptation to the Impact of Climate Change in Food Security: A case of Civil Society’s Experience in Malawi, Willie Kalumula, Malawi</td>
<td></td>
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<tr>
<td>09:10 – 09:25</td>
<td>Storms more Ominous than Climate Change? Mitigating Policy threats to African Food Production, Carl B. Thompson</td>
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<tr>
<td>09:25 – 10:00</td>
<td>PLENARY</td>
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<tr>
<td>Time</td>
<td>Session Details</td>
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<tr>
<td>10:00 – 10:10</td>
<td>TEA BREAK</td>
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<tr>
<td><strong>SESSION 6: INNOVATION SYSTEMS FOR CLIMATE CHANGE ADAPTATION</strong></td>
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<tr>
<td>10:10 – 10:30</td>
<td>Mainstreaming the Energy-Gender-Poverty Nexus in Climate Change Adaptation Strategies, Raphael Jingura, Zimbabwe</td>
<td></td>
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<tr>
<td>10:30 – 10:50</td>
<td>Innovation Systems to Support Climate Change Copying Mechanisms for Communities in Namibia, Benedict Libanda, Namibia</td>
<td></td>
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<tr>
<td>10:50 – 11:20</td>
<td>Developing leadership for climate change: An integral learning and approach to management, adaptation and mitigation, Gereon Klein, South Africa</td>
<td></td>
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</tr>
<tr>
<td>11:20 – 11:55</td>
<td>Facilitation for change: Enabling communities and field facilitators to develop adaptive capacity for dealing with climate change impacts: Lessons from 20 years practice in southern Africa, Kuda Mirwira</td>
<td></td>
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<tr>
<td>11:55 – 12:30</td>
<td>PLENARY</td>
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<tr>
<td>12:30 – 13:00</td>
<td>GROUP ALLOCATIONS</td>
<td></td>
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<tr>
<td>13:00 – 14:00</td>
<td>LUNCH</td>
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<tr>
<td><strong>IN-DEPTH GROUP WORK AND WAY FORWARD</strong></td>
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</tbody>
</table>
| 14:00 – 15:40 | Group 1: How to achieve effective community-based adaptation in southern Africa. Status, challenges, critical gaps and opportunities: Chair-Kessy Savinus  
  Group 2: Strengthening policy and advocacy issues on climate change: Status, challenges, critical gaps and opportunities:  
  Chair- Percy Makombe  
  Group 3: Communication awareness and access to information. Status, challenges, critical gaps and opportunities:  
  Chair Patricia Masanganise  
  Group 4: Strengthening mitigation and adaptation strategies through science and technologies. Status, challenges, critical gaps and opportunities. Chair-Isaac Mapaure  
  Group 5: Innovation systems in climate change adaptation. Status, challenges, critical gaps and opportunities. Chair-Gerson Klein  
  Group 6: Is there a Role for RAEIN- Africa in Climate Change Issues in the Region?  
  Chair- Kuda Murwira |
| 15:40 – 15:50 | TEA BREAK                                                                       |
| 15:50 – 16:50 | GROUP REPORT BACK, PLENARY AND WAY FORWARD                                      |
| 16:50 – 17:10 | Closing Remarks of the Conference, Doreen Mnyulwa, Regional Director, RAEIN-Africa |
| 17:10 – 17:25 | Closing of the Conference, Dr. Phumzile Dlamini – Board Member South Africa RAEIN-Africa |
| 17:25         | End of conference                                                              |
# ANNEX 2: LIST OF PARTICIPANTS AT THE MITIGATION AND CLIMATE CHANGE CONFERENCE

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Title/Position</th>
<th>Organization/Institution</th>
<th>Contact Information</th>
<th>Email Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abias Huongo</td>
<td>Project Coordinator</td>
<td>Initial National Communication Angola</td>
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<td>6</td>
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</tr>
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<td>7</td>
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</tr>
<tr>
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</tr>
<tr>
<td>9</td>
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<td>10</td>
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23: Patricia Masanganise  
Development Expert-TAC  
Member  
Khanya-AICDD  
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Speech delivered at the Conference on Mitigation and Adaptation Strategies to Climate Change and Innovation Systems Southern Africa Birchwood Hotel, Johannesburg, South Africa, on 23rd March 2010

By

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The conference Facilitator,
The Chairperson, Board Members and partners of RAEIN-Africa,
The Regional Director RAEIN-Africa,
Distinguished participants,
Ladies and Gentlemen,

Introduction

It is a great honour and privilege for the NEPAD Secretariat, to be invited to this very important Forum. Therefore, I would like to thank Chairperson of RAEIN-Africa and the conference organisers most sincerely for this. Before I proceed with this speech, allow me to convey apologies from Prof. Richard Mkandawire, the Head of CAADP at the NEPAD Agency, who has been unable to come because of other pressing engagements. Therefore, he has delegated me to represent him and read is speech.

Distinguished delegates, I am delighted to note that coming soon after the December 2009 Conference on Climate Change, this conference is an opportunity for RAEIN-Africa and your partners to reflect on the outcomes of the Copenhagen Conference and recommend a strategic direction for your stakeholders here in Southern African. It is also our hope that the outputs of this meeting could be useful for other sub-regions in Africa.

As you may be aware African Heads of State and Governments have placed greater importance on agriculture hence, they endorsed the Comprehensive Africa Agriculture
Development Programme (CAADP) in 2003, providing the guidance for the agriculture-led economic development. Under the CAADP framework it is believed that unless urgent attention is directed at the agricultural sector, many African countries may not be able to attain the Millennium Development Goal Number One (MDG 1). Therefore, NEPAD urges its member states to ensure that their agricultural sectors grow at a minimum, at least 6% annually in order to eradicate hunger and food insecurity. However, the 6% target is proving unattainable because of the uncertainty of the rainfall patterns in rain-fed agriculture, which is believed to be cause by “climate change”.

Distinguished delegates, we are alarmed with the rate at which crops are failing due to changes in the timing of rainfall; emergence of pests and parasites in areas where they never used to occur; and shifts in fish species abundances caused by alteration in water temperature regimes.

All these changes leave the poor-resource farmers, pastoralists and fishers helpless as their livelihoods get eroded since they are incapable of adapting to the changes. Therefore, our key message to this Forum is that Africa must recognise that great opportunities do exist for agriculture to generate more wealth for our continent, but if and only if:

a) Policy-makers acknowledge that climate change is a real threat not only to food and environmental security, but also to human security;
b) We in Africa can improve our agriculture governance mechanism;
c) African states increase investments to build the requisite science, technology and innovation capacity to deal with climate change; and

d) Climate change policies are integrated with other national and regional development plans.

Therefore, it is our hope that this Forum will deepen our understanding of the challenges confronting the African agriculture with regard to climate change, as well as provide our policy-makers and agricultural managers with the necessary tools with which to improve the governance of our agricultural and natural resources sectors.

The role of science and technology innovation in enhancing Climate change adaptation and mitigation strategies; community’s ability to respond to shocks and stresses

The role of science, technology and innovations in enhancing the capacity of agriculture-dependent communities adapt to the changes in the weather patterns can never be over-emphasised. Through the various continental development frameworks, NEPAD has recognised the role science can play in generating new knowledge necessary for building resilient agricultural livelihoods.

The NEPAD Science and Technology’s Consolidated Science and Technology Plan of Action is based on three interrelated conceptual pillars: (a) capacity development and strengthen; (b) knowledge production, and (c) technological innovation.

Furthermore, three of six Cornerstones of the NEPAD Capacity Development Strate-
gic Framework (CDSF) specifically calls of Africa to undertake (i) Knowledge-based and innovation-driven processes that enhance fact and evidence based decision making and encourage increased investments in knowledge and scientific institutions and science and technology; (ii) Adaptive capacity development institutions driving a progressive agenda for capacity development and producing entrepreneurial client-oriented cadres; and (iii) utilizing African potentials, skills and resources for development by mobilising Africa’s own financial and human resources for development and transformation - locally, continentally, and globally.

The CAADP Pillar IV emphasises science-driven agriculture, where research, technology generation, dissemination and adoption are key to increased agricultural productivity.

Although many African countries have made significant strides in agricultural and natural resources science, they still lack the critical mass of technical and scientific expertise to monitor the impact of climate change as well as generate, use and interpret data on the biology, ecology and biodiversity dynamics and status of most important food species, especially those of less commercial importance (such as millet, sorghum and indigenous vegetables to mention but a few). As you may be aware, the IPCC report had made a number of critical suggestions on how to improve adaptability of agricultural-dependent communities in Africa. However, the stuck reality is that the inability to generate, translate and utilize scientific information for decision-making and policy formulation hampers many countries from improving the capacity of their farmers to adapt to climate change, with wider implications for the attainment of the MGD 1, viability of agriculture-based trade and socio-economic sustainability.

All you have been following he controversy around climate change science; I will not comment on this, however, we need to reflect on the need for science to be good enough not to leave gaps for misinterpretation. As we all know, science is a journey, a process of discovery, and often work-in-progress. Therefore, those who doubt the science of climate change might be wrong if they do not act now.

Lack of communication between researchers and farmers, communities

The agricultural sector is changing rapidly, many countries are experiencing massive growth while others are lagging behind; production and marketing strategies are shifting in response to rising demand for food and to new constraints in access to land as well as factor productivity. In spite of the agricultural sector’s importance, we have a very poor understanding of how and where new knowledge in the sector is generated, exchanged and applied, on what basis and to what effect economic and policy decisions are made, and what constraints and opportunities might exist for improving knowledge-based sector development. In short, we know very little about how innovation in the sector is working and how it could be fostered for wider socio-economic benefits. Consequently, many technologies have been generated by scientists but remain unused by farmers, either because they are irrelevant or they have merely not been accessible to farmers.
This points to the lack of communication between sources of new knowledge and the potential users of that knowledge. Therefore, in order to improve this understanding, it is necessary to undertake critical sector reviews using the Agricultural Science, Technology and Innovation (ASTI) systems approach in order to identify the missing links. Urgent actions are needed in order to develop recommendations for strengthening institutional capacities and processes for knowledge-based climate change policies and economic planning in the agricultural sector.

**Partnership with RAEIN-Africa**

Since agriculture is a global public good, tackling the challenges of African agriculture in general and climate change in particular, requires partnership in order for us to make progress towards addressing this challenge. Therefore, NEPAD agency welcomes you all to join in this partnership because we need a two-way process of knowledge exchange and learning between centres of excellence, based around international best practice. NEPAD is about partnership; hence, we encourage African institutions to establish centres of excellence in various fields. We currently have centres dealing with water development, fisheries, food security, bio-security, bio-sciences, sustainable land and water management. Therefore, RAEIN-Africa is urged to partner these centres and work together in developing new tools for dealing with the changing rainfall pattern and temperature regimes. RAEIN-Africa could work with NEPAD to establish mentorship programmes for climate change experts, including networks between and among professionals at national, regional and global levels. Special attention should be focused on improving the linkages between research, planning, policy and farming at national and regional levels for science-based agriculture development.

On our part, the African Union Commission and NEPAD Agency will ensure that we provide the political capital necessary for countries to create requisite environment for policy and governance reforms necessary to enhance food security and the resilience of agriculture-based livelihoods in face of climate change. Therefore, we are ready to work with you to ensure that we open the policy space to all stakeholders to interact with the highest level policy-making process in order to turn African agriculture into an economic asset with potential to generate and sustain substantial wealth.

**Conclusion**

Distinguished delegates, in concision, I wish to take this opportunity to inform you about the transformation which NEPAD has undergone recently. The 14th Ordinary Session of the Assembly of the AU on 2nd February 2010 approved the integration of the New Partnership for Africa’s Development (NEPAD) into the structures and processes of the African Union; including the establishment of the NEPAD Planning and Coordinating Agency (NPCA) or NEPAD Agency to replace NEPAD Secretariat. NEPAD Agency is now the technical body of the African Union and our mandate includes:
1. Facilitate and coordinate the implementation of the continental and regional priority programmes and projects;
2. Mobilise resources and partners in support of the implementation of Africa’s priority programmes and projects;
3. Conduct and coordinate research and knowledge management;
4. Monitor and evaluate the implementation of programmes and projects; and
5. Advocate on the AU and NEPAD vision, mission and core principles and values.

The new NEPAD structure places emphasis on programme implementation, strategic resource mobilization and efficient support systems to ensure effective programme delivery.

With these remarks, it is my singular honour to declare this Conference Mitigation and Adaptation Strategies to Climate Change and Innovation Systems Southern Africa officially open.

I thank you for your attention.
In Southern Africa, the impacts of climate change vary, for example, the area suitable for agriculture, the length of the growing season and yield potential, particularly along the margins of semi-arid and arid areas. In response to these challenges, a number of adaptation strategies have been undertaken, albeit with varying degrees of success.

The Mitigation and Adaptation Strategies to Climate Change and Innovation Systems in Southern Africa Conference was RAEIN-Africa’s contribution to creating a platform where regional experts can share experiences, identify gaps in enhancement of community adaptation strategies to climate change, improve country capacities to identify clean technologies that mitigate our emission, and define the role that innovation platforms can play in solving these gaps.

This proceeding provides an insight of the deliberation of the conference. The Status reports highlighted evidence of climate change effects in the region and the need for harmonising the terminologies for ensuring a common understanding around the problem. In the adaptation strategies session, the presentations showed how a cost-benefit analysis of strategies needed to be well understood so as to advise the communities better. Communication and awareness session showed the need for a multiplicity of stakeholders brought on board through participatory communication approaches. The human rights based approach to programming issues of climate change was the highlight of the session on legal and policy implications. The innovation systems session expounded on the various participatory mechanisms that could be explored to increase the resilience of communities to climate change, particularly emphasising the empowerment of rural communities.