



**REPORT OF 2010 CAP KNOWLEDGE EXCHANGE WORKSHOP:  
ECOSYSTEMS BASED ADAPTATION AND MONITORING FOR ADAPTATION  
10<sup>th</sup> -12<sup>th</sup> NOVEMBER 2010**

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## INTRODUCTION

On the 10<sup>th</sup> and 11<sup>th</sup> of November 2010, the Climate Action Partnership hosted a two-day Knowledge Exchange Workshop at the Centre for Biodiversity Conservation in Cape Town. The workshop facilitated an exchange of knowledge, ideas, and experiences amongst CAP partners, projects, and associates as well as additional groups and individuals who align with CAP's mitigation, adaptation and education work. The two days focused on ecosystems based adaptation to climate change and teasing out appropriate and effective criteria, methods, and indicators for monitoring and evaluating adaptation to climate change. Delegates presented on national and international climate change policy and funding mechanisms, tools for adapting to climate change such as climate modeling and critical biodiversity areas maps, and their own project and programme work around ecosystems based adaptation. Presentations also included a look at monitoring and evaluation processes that have been used in the past. 45 delegates attended the workshop. This report provides a brief overview of the key findings of the workshop and summaries of the presentations given over the two days. A summary of the outcomes of the workshop session around monitoring and evaluation methods and criteria is included at the end of the document. Full PDF copies of each presentation and some additional resources are available on the CAP website under the 'workshops' tab: [www.cap.org.za](http://www.cap.org.za).

The objectives of the workshop were to:

1. Build an understanding of ecosystems based adaptation concepts.
2. Update each other on developments on ecosystems based adaptation and REDD, both nationally and internationally.
3. Report back on CAP adaptation and mitigation work that focuses on ecosystems based adaptation.
4. Review capacity building and educational efforts around ecosystems based adaptation.
5. Provide feedback on current research into ecosystems based adaptation
6. Present cases studies of ecosystems based adaptation from outside South Africa
7. Discuss monitoring and planning for ecosystems based adaptation
8. Network, re-connect, and have fun.

## OVERVIEW

The ecosystems based climate change adaptation work of CAP partners and associates presented at the workshop included:

- The inclusion of ecosystems based adaptation into national and international policies and strategies (ACCC, CAP, CI, DEA, ERC, SANBI)
- Additional work on the enabling environment including sourcing funding and developing tools such as critical biodiversity areas maps and adaptation frameworks (CAP, SANBI)
- Climate science and modeling (SANBI)
- Habitat restoration to build resilience in the landscape (CI, EKZN Wildlife, EWT, Nollen Group, WCT, WWF). This included thicket restoration in the Eastern Cape, reforestation and forest restoration in KZN, the restoration and management of moist grasslands in KZN, and rehabilitation along riparian corridors in the succulent Karoo.
- The integration of carbon sequestration, biodiversity conservation, and socio-economic development benefits for participating communities (EKZN Wildlife, EWT, WCT, WWF)
- The establishment of biodiversity stewardship corridors to facilitate landscape level adaptation to climate change (EKZN Wildlife, EWT, TMF) and the assessment of these (BPM)
- The conservation of critical water catchment areas, river systems, wetlands, and estuaries (CI, EWT, TMF, WWF)
- The development and implementation of education and training programmes on ecosystems based adaptation (CI, WESSA)
- The development and implementation of monitoring and evaluation methodology, criteria, and indicators (BPM, CAP, Green Choice)

Ecosystems based adaptation is beginning to be more widely recognised by and included in national and international policy and strategy. Financing mechanisms such as REDD+ are beginning to explore the inclusion of ecosystems other than forest, such as thicket, grasslands and peatlands, as important adaptation and mitigation sites. In the international climate change policy, there is growing acknowledgement that we are already locked in to climate change and need to prepare for and respond to the potential impacts of this. EbA approaches that take climate change into account necessitate a shift in response towards building capacity, managing risk, and developing flexible response strategies. In South Africa, the adaptation framework is included in the National Climate Change Response Policy under various sector plans as response strategies. . CAP and its partners and associates are working with local municipalities in Namaqualand and KZN around integrating EbA approaches into regional and district development and risk management plans.

EbA needs to be more clearly defined however. Following the presentations and workshop, there was broad agreement that EbA refers to the adjustment of both people and nature to the impacts of climate change and includes the management, conservation, and restoration of key ecosystems as well as ensuring the maintenance of ecosystem services and sustainable livelihoods. Habitat loss is the greatest threat to biodiversity currently, but it is also a serious threat to security for people as water supplies and food production systems are undermined by a loss of ecosystem services. For the monitoring and evaluation of EbA, there is therefore a need to ensure that biodiversity and ecosystem factors are considered alongside evaluating how such approaches help people to adapt and/or become more resilient. A concern was also raised that the term EbA may not adequately describe all the work being done by the conservation sector.

South Africa shows many strong examples of EbA.

- WCT is involved in reforestation and forest restoration efforts at several sites in KZN that work towards addressing biodiversity conservation, socio-economic development, preservation of ecosystem services, and climate change mitigation and adaptation simultaneously. An approach that has been taken by many of the organisations present is the establishment of biodiversity stewardship corridors.
- Mike Powell of the Nollen Group is working with farmers in the Eastern Cape around preventing thicket degradation, preserving ecosystem services, and exploring the potential for carbon financing from restoration efforts.
- EKZN Wildlife works with various land owners from private individuals and corporates to community-owned land to reduce fragmentation in the landscape, establish protected and better-managed areas along corridors with climate change adaptation potential, and encourage sustainable land-use practices that also contribute to socio-economic development.
- EWT's Riverine Rabbit programme in Loxton in the succulent Karoo is also following a stewardship approach to habitat rehabilitation along riparian corridors. Land-owners are offered rehabilitation assistance in exchange for support from landowners.
- WWF and TMF are also pursuing a stewardship corridor approach to EbA in the Western Cape's Cape Floristic Region and KZN grasslands systems.

The ACCC, CI and SANBI also presented on examples of EbA from outside of South Africa, including Zambia, Senegal, Madagascar, and Mongolia. In all of these case studies, biodiversity conservation concerns are being addressed in conjunction with efforts to establish sustainable livelihoods for the people reliant on these ecosystems and to build the resilience of both to the impacts of climate change through responsible land use and management practices.

In all the EbA projects, monitoring and evaluation processes to evaluate the success and effectiveness of such interventions are critically important. Indicators should include both environmental and socio-economic evaluation criteria. To a certain extent, many indicators have already been developed and refined in conservation and development fields and need only to be applied through a climate change and EbA lens. Some new criteria may also be needed. Attempts should be made, also, to include local

communities, landowners, local government departments, and other stakeholders such as schools or smaller local NGOs and volunteer groups in monitoring and evaluation processes. There is also an urgent need to investigate ways of accessing existing data sets so that time and resources are not wasted on repetitive data collection. It was also proposed during the discussions that there is a need to prioritise M&E criteria and identify those factors that do not require monitoring. Green Choice presented their monitoring and evaluation framework, guidelines, and methodology for 'green' farming activities in South Africa and Richard Lechmere Oertel from BPM introduced research into the effectiveness of CAP's climate change adaptation corridors.

Additionally, Guy Midgley from SANBI issued a word of caution on relying too heavily on fine-scale climate models and projections. The impacts of GHGs, global warming, and other climate change events and processes are not well understood and quite uncertain. At best, climate scientists need to produce a range of plausible future scenarios against in which to integrate EbA approaches and plans and against which to test them.

## DAY ONE

### ***SESSION 1: AN ENABLING ENVIRONMENT FOR ADAPTATION INCLUDING POLICY DEVELOPMENTS***

#### **1.1: INTERNATIONAL AND AFRICAN POLICY**

##### **International Policy on REDD+: The road to Cancun – Brian Mantlana (SANBI)**

Copenhagen represented a first attempt to involve developing countries in reducing emissions. The split between developed and developing nations came to the fore but was not noticed due to the complex dynamic between USA and China and USA's decision not to ratify the Kyoto protocol. Brian Mantlana argued that a major barrier to any agreement in Cancun will be that key countries involved in the debates have fundamentally different ideas about what it means to implement or associate with the Copenhagen Accord and what the legal architecture should look like. The USA requires symmetric, though differentiated, legal commitments to reduce emissions for both developed and developing countries. China, on the other hand, is unwilling to accept any legally-binding limits to its emissions. The inability of the US and China to agree halts the development of a concrete resolution for the Kyoto protocol and these two biggest emitters globally are seen as failing to act. Mantlana proposed that, at Cancun, participating countries would either have to arrive at consensus based decisions, where any one country can veto proposals, or compromise on actionable points from the Copenhagen Accord. He argued that a likely outcome in Cancun will be a continuation of the current trends towards multilateral, non-legally binding, and the development of decentralised forums on themes such as REDD+, which will concentrate work under groups of countries with the capacity to act and continue discussion on these issues.

Mantlana also gave an update on International REDD+ policy. There is now broad consensus on what REDD+ is and what its scope is. There was also an agreement on methodological approaches at Copenhagen. That said, we going to Cancun with political barriers that are broader than REDD+, including the entire legal architecture around the Copenhagen Accord. Some countries are expected to make it difficult to achieve agreement. Financing will remain largely bilateral in character and countries with better governance and large forest reserves will be the main beneficiaries. REDD+ will be one of the central issues that must be agreed at COP16 but the difficulties Mantlana highlighted will likely be dealt with only as a political decision taken at the highest levels. Mantlana argued that decisions taken at COP16 should be leading towards an international legally-binding framework with the UNFCCC as the go-to organisation. At Cancun, however, there are likely to be no such legally-binding agreements around REDD+ and forested countries will probably choose to continue with strategic bilateral and multilateral agreements.

## **National Developments on REDD+ – Dr Sebataolo Rahlao (ERC)**

Sebataolo Rahlao, working on developing a national REDD programme for climate change mitigation by increasing carbon sinks, brought the REDD debates to the South African context. Globally, GHG emissions show a 60-40 split between those from energy and non-energy related activities. In South Africa, this split is 80-20. As a result most climate change energy in South Africa is focused on reducing emissions from energy. South Africa is, however, also looking at doing a feasibility study on REDD+ at the moment with the Departments of Environmental Affairs and Forestry and Fishery.

REDD+ introduces a financial mechanism that makes reducing deforestation economically viable over other land-use practices that require deforestation or the clearing of vegetation. The mechanisms of REDD+ include reducing deforestation and forest degradation, supporting agro-forestry, and supporting the sustainable management of forests.

In South Africa, our carbon is not all stored in forests, but rather in other eco-systems such as thicket and grasslands and, centrally, in soils. South African's forests only cover 1.1% of the landscape, are mostly for commercial use, and have a low carbon density. Afforestation plans on marginal land face competition from the growing bio-fuels industry. Rahlao is working towards quantifying the estimated 4.1 gigatonnes of carbon stored in a variety of South African ecosystems so that these can be included for REDD financing. There is some potential for South Africa to access REDD financing under a broader definition of forest that includes thicket and grasslands. Currently thicket does not qualify under the South African definition of a forest. Rahlao suggested that areas of high biodiversity value should have their carbon quantified so that, should they show a high carbon value, this can mobilise funds for conservation efforts.

## **Ecosystems based Adaptation and International Policy Developments on EbA – Sarshen Marais (CAP) on behalf of Hannah Campbell (CI)**

Sarshen Marais presented on behalf of Hannah Campbell and suggested that, while mitigation is critical, we are already locked in to climate change and need therefore to adapt, prepare for and respond to the impacts of this. People and ecosystems will suffer. We are already relying on stressed environments and mitigation will not be quick enough to stop fundamental climate change. When we consider adaptation we need to think of the continuum of approaches that are required. Without considering climate change we tend to focus mainly on vulnerability and therefore to concentrate efforts on socio-economic development and biodiversity conservation. Taking climate change into account necessitates a shift in response towards building capacity, managing risk, and developing flexible response strategies. Managing risk is especially important where climate change is integrated into development planning and this is where EbA has most potential to align. Ecosystems-based adaptation is the adjustment of both people and nature to the impacts of climate change and includes the management, conservation, and restoration of key ecosystems.

Where EbA is applied, people adapt to climate change using biodiversity and ecosystems services as part of an overall adaptation strategy that increases resilience and maintains essential ecosystems services.

Reducing emissions is currently the main goal of international climate change policy but adaptation is becoming more important and is now highlighted in the Copenhagen Accord along with the need for developed countries to support developing countries with technology and finance. The Copenhagen Accord calls for adaptation action that is based on scientific and local knowledge, is integrated into national and other planning and includes the protection and sustainable management of natural resources and ecosystems as well as the services they provide.

Adaptation is challenging and there is a lack of implementation and planning capacity and funding for adaptation generally. Adaptation is, however, necessary to address climate change and flexibility is important. One area of focus for action should be on policy, towards creating an enabling environment for the implementation of adaptation strategies.

### **Capacity building around EbA – Terry Hills (CI)**

Terry Hills presented on his 'training of trainers' programme on ecosystems-based adaptation to climate change which he has presented in Kenya and India. He has developed a training toolkit which he is interested in sharing with workshop participants. The programme targets conservation and development practitioners. His capacity building approach focuses on local knowledge, content, and expertise, aims to be responsive to the needs of participants, includes relevant site visits, and aims to achieve a balance between lectures and participatory learning. Hills argued that explaining climate science may not be the best use of time and it is more useful to participants for facilitators to identify EbA tools that are available locally and internationally, and work through their strengths, weaknesses, and relevant applications. Hills training materials are available and, having already completed training for West and East African countries, he would like to develop a workshop and training programme for Southern Africa.

### **Preventing Thicket Degradation through Monitoring, Advocacy, and Compliance – Mike Powell (Nollen Group)**

Mike Powell, working on a programme to monitor carbon capture and restore natural capital through thicket restoration, presented a call to action and moratorium on further transformation in critical habitats. The subtropical thicket biome in which he works exhibits 30% endemism in plant species. Powell highlighted the urgent need for REDD+, new policy, or more compliance monitoring around thicket degradation. He proposed that the continued mining of natural resources by overstocking constitutes a climate crime, as does the unsustainable use of water for irrigation purposes. He argued that conservation NGOs must stand together and tackle the 'thorny issues', challenging established water access rights and land-use decisions. Powell suggested that thicket habitats should be regularly monitored on a farm-by-farm basis, employing economic leverage to achieve results and following spatially explicit and connected stewardship plans. On managing the potential for carbon financing to encourage perverse practices, Powell stated that any degradation post-1990 will not qualify for VCS certification.

## **African Consortium on Climate Change – Mosty Musa and Manoah Muchanga**

Manoah Muchanga presented on his work around EbA in the Zambian Copperbelt. There is a strong focus on rural areas as 705 of Zambians live in rural areas and, of these, 80% rely on forest resources for energy. Pristine ecosystems are rhetorically acknowledged by the Zambian government as essential for sustainable development and there is a policy in place aimed at preserving biodiversity to mitigate various environmental challenges including climate change. However, there are multiple constraints to EbA and monitoring in Zambia. There are many types of uncontrolled water, soil, and air pollution. Mines dump liquid wastes into the river and wetland systems and burning and cultivation activities take place along many river banks. Open pit mining results in highly degraded landscapes and there is also large-scale land degradation, deforestation, desertification, and soil erosion, all taking place in a context of widespread poverty and minimal government capacity. How to approach forest restoration in this context is a major challenge. Muchanga is working on a capacity building course in climate change education from the University of Zambia which is aimed at conscientising people in order to be able to involve them more meaningfully in environmental planning.

## **1.2: NATIONAL POLICY AND FUNDS**

### **South African National Strategy Developments – Nkoniseni Collins Ramavhona (DEA)**

Nkoniseni Ramavhona from the Department of Environmental Affairs spoke on the South African National Climate Change Response Policy. 6 cabinet approved policy directions inform the policy document, which is currently in draft form and due to be released for a second round of public comment shortly. Ramavhona outlined the policy document and highlighted affected sectors. The Green Paper will provide a brief overview of roles and responsibilities regarding the policy directives and an overview of the institutional framework and monitoring and evaluation processes integrated into the national approach to climate change. The policy commits government to certain broad sector based targets. An adaptation framework is included under sector plans, not as a separate concern in the policy. Emissions trading and carbon taxes, incentives, and subsidies were discussed. Ramavhona asked that those present input into the Green Paper when is it gazetted and also check that their previous inputs were satisfactorily included.

### **CSA/CAP District Adaptation Policy Work in Namaqualand – Simisha Pather-Elias (CAP)**

Simisha Pather-Elias presented her climate change adaptation framework for municipalities, aimed at aligning ecosystems and community based adaptation processes and priorities with existing Integrated Development Plans and Disaster Risk Management (DRM) plans. This framework has been presented to the Namaqualand District Municipality, who are in the process of developing a new DRM plan. There has been a high level of buy-in at the planning phase and CAP/CSA may be involved with implementation and level 3 planning if funding is available. Pather-Elias focused on the importance of mainstreaming

EbA into existing plans and roles. Additionally, climate change is an uncertain science and municipalities must be encouraged to pursue 'no-regrets' measures. Sustainable land use practices should be designed as far as possible to have additional risk reduction, poverty alleviation, biodiversity conservation, and socio-economic benefits.

## ***SESSION 2: REDD, REFORESTATION, AND EBA PROJECT FEEDBACK***

### **Case Study: EbA projects funded through the Adaptation Fund – Caroline Petersen (SANBI)**

Caroline Petersen, from SANBI's Learning Network, introduced some examples of international funding opportunities through the Adaptation Fund. UNDP trends in adaptation funding are moving away from pilots to a more programmatic approach – internalizing climate change risk management into policies and planning, building capacity, and facilitating technology transfer. The Adaptation Fund was created to finance concrete adaptation projects and programmes in developing country party to the Kyoto Protocol recognised as particularly vulnerable to climate change. The Fund involves direct contributions from developed nations and a 2% levy on credits generated by the CDM. The core objectives of the Fund are to reduce vulnerability to the adverse impacts of climate change and increase adaptive capacity to respond to climate change. Financing from the Adaptation Fund is accessible to everyone but a national implementing entity is required in order to access funds through your host country. Alternatively, funds are accessible directly through a multilateral agency such as the World Bank or GEF.

Petersen gave examples of projects from Senegal, Honduras, and Mongolia which have already successfully accessed financing through the Adaptation Fund.

Other funding opportunities for EbA in South Africa include CEPF (e.g. WCT's Maputaland-Pondoland-Albany Hotspot) and GEF. GEF funding will likely go to government departments and parastatals at first, including DEA, SANBI, and SANParks, but this is still important in terms of securing funding for integrating biodiversity conservation and climate change more effectively and including a climate change filter on national budgeting. In the discussion, Onno Huyser raised the point that a lot can also be achieved locally, through, for example, green economy processes and policy outcomes, without large amounts of international funding.

### **KZN Forest Restoration and CCBS – Andrew Whitley (WCT)**

Andrew Whitley discussed WCT's rural development, EbA, and mitigation work around carbon sinks in KZN. At the Mkuze floodplain site near Mkuze game reserve, WCT works with an agricultural community utilizing the flood plains for cultivation. WCT is working with farmers at Mkuze to develop an agro-forestry model that includes planting fruiting trees that are adapted to living in a flood plain, mangoes for example, along with indigenous tree species.

Their project site on the edges of Ongoye Forest Reserve has extremely high biodiversity value. While large scale deforestation in the area is not an immediate threat, there is some intensive selective

harvesting from the forest, particularly for building materials, and mounting development pressure in the area. The project is in the early stages but may focus on replanting in the riparian areas and along drainage lines as well as cultivating tree species that provide necessary resources and thereby take pressure off the forest itself from unmanaged resource harvesting.

Whitley also discussed the WCT project at Buffelsdraai landfill site, which will be their first accredited Climate Community and Biodiversity Standards (CCBS) site. WCT is engaged in sequestering carbon through replanting fields under sugarcane into areas of indigenous forest. This process will create a significant patch of green landscape in the peri-urban areas around Durban and generate benefits in terms of biodiversity, water quality, and flood mitigation. The project also has a significant community upliftment aspect through the Indigenous Trees for Life Programme. Baseline community and biodiversity assessments are underway and WCT will be aiming for Gold Level CCBS by addressing the needs of the poorest beneficiaries, identifying high conservation value species and processes, and including strong adaptation benefits. See [www.climate-standards.org](http://www.climate-standards.org) for more on CCBS.

Whitley acknowledged that, in South Africa, carbon is not stored largely in forests and WCT is not advocating wide scale tree-planting as a panacea but implementing reforestation in areas that were originally forest.

### **Adaptation for Biodiversity: implementing and monitoring corridors and stewardship for climate change – Kevin McCann (EKZN Wildlife)**

Kevin McCann has been working on establishing biodiversity stewardship corridors in KZN for the last five years and his programme includes an attempt to mainstream climate change adaptation into stewardship. Conservation of biodiversity, ecological processes and ecosystem services through corridors prepares ecosystems for change without the loss of core structure or function. This is achieved through the implementation of planned interventions that allow systems to respond naturally. An important aspect of EbA is that it also builds the resilience and reduces the vulnerability of local communities responding to climate change. He argued that sustainably managed ecosystems and natural resources provide social, economic, and environmental benefits and explained that EKZN Wildlife is using stewardship as one of the core mechanisms to achieve this.

McCann reported on the CAP supported projects in the stewardship programme and then discussed constraints to implementing EbA. These include a lack of information on and general uncertainty around how ecological processes will react to climate change and the tipping points of ecosystems. There is also uncertainty around the potential for degraded systems to respond to better management and rehabilitation efforts, coupled with a lack of institutional capacity and resources and an immediate need to deal with the impact of extreme events. McCann advocated improved monitoring of indicator species and other landscape features to improve our understanding of species and systems' responses to climate variability and change and inform planning.

## **Riparian Habitat Restoration for Adaptation in the Nama Karoo – Ryno Erasmus (EWT)**

Ryno Erasmus, Senior Field Officer on EWT's Riverine Rabbit Programme, presented on his riparian habitat rehabilitation initiative in Loxton. Desert systems are where we are seeing the impacts of climate change most urgently and developing appropriate responses for arid zones is increasingly important. Erasmus is working on monitoring Riverine Rabbit populations in the succulent Karoo and negotiating with landowners to conserve and rehabilitate the species core riparian habitat along stewardship corridors. EWT has been providing a veld rehabilitation service based out of an indigenous nursery in Loxton in exchange for support from landowners. The habitat rehabilitation efforts also form part of an adaptation strategy for the area around the sustainable management of limited water and grazing resources. Succulent Karoo veld is very difficult to rehabilitate once degraded – it is sensitive to disruption and takes a long time to recover and re-establish.

Erasmus is establishing 10 climate change monitoring weather stations along the Sak River and collecting anecdotal evidence from farmers around changes in weather patterns and river behavior. He is also monitoring vegetation change in the rehabilitation sites and areas alongside these, checking species composition and recovery rates, and monitoring the effectiveness of different planting, land management and water management approaches. Photographic monitoring of the adaptation and corridor linkages is ongoing.

## ***SESSION 3: RESEARCH AND CAPACITY BUILDING FOR EBA***

### **EbA Case Study from Madagascar – Sarah Frazee on behalf of Radhika Dave (CI)**

Radhika Dave from CI's Centre for Applied Biodiversity Studies, sent a presentation on a Madagascar EbA case study which was screened by Sarah Frazee. The project had both conservation and livelihoods elements. Much of Madagascar's forest habitat has already been lost and what remains (10%) is quite fragmented. Dave proposed that actions to reduce the biological impact of climate change on Madagascar should include protecting all remaining natural habitat, restoring connectivity in fragmented forests, restoring riparian corridors, and managing the remaining natural forest area for species response to climate change.

In terms of building livelihood resilience to climate change, Dave suggested that clarifying land tenure around high biodiversity areas, intensifying agriculture in an ecologically sensitive way, instituting micro-credit mechanisms, regularly assessing risk and identifying and constructing climate resilient infrastructure would help. The project so far has been developing fine scale models for species range shifts under future climate change scenarios to inform conservation planning. They have also been assessing the condition of riverine forests and the potential for these to act as migratory corridors for species' range shifts. CI is currently investigating the feasibility of up-scaling reforestation efforts in key

priority areas and the potential for a sustainable livelihoods approach to reduce pressure on forest resources and increase the resilience of communities.

### **Integrating Climate Change and EbA Concepts into Eco-schools – Bridget Ringdahl (WESSA)**

Ecoschools is an international program operating in 47 countries, in 27 000 schools globally. Countries in Africa include Kenya, Morocco, South Africa and Tunisia. Schools commit to better environmental performance through learning and management, via the national environmental curriculum in various subjects. The process is based on learning and action taking on a continuous basis.

Ecoschools has been working with CAP on a climate change project to help schools develop their understanding of climate change and about building resilience in their communities while adapting and responding to changing and unpredictable climate conditions. Climate change concepts have been integrated into lesson planning and activities aligned with what Ecoschools are already doing in their environmental education.

The climate change curriculum involves carbon/eco footprints and hand prints which show how people can make a positive impact through action towards sustainability. Ecoschools uses new technologies, such as solar cookers, vegetable gardens, and recycling drives as opportunities for active learning and continues to incorporate climate change into teaching where possible.

## DAY TWO

### *SESSION 1: ADAPTATION RESEARCH AND MONITORING*

#### **Climate Change Models, Variability, and Adapting to Climate Change – Dr Guy Midgley (SANBI)**

Guy Midgley cautioned against putting too much emphasis on fine-scale climate models when designing adaptation plans. Statistically, the more precise one gets with climate models, the less certainty one has in the projections produced. Global climate models currently do not take into account several factors, such as ocean temperatures. Attempts to downscale climate models give a false impression of precision and mask the generally widely variant range of potential future scenarios under climate change. Midgley argued that such fine models produce a potentially confusing plethora of projections that act as a barrier to impact assessments and adaptation planning and diverts attention and resources away from understanding critical global processes and tipping points. He pointed out that fine-scale climate models are different to using fine scale conservation maps for planning which integrate climate change information from global models at a broad scale. It was emphasized that fine scale climate models, due to their uncertainty, should not be the basis for decision making and planning..

Midgley suggested that, rather than seeking out increasingly finer-scale climate change models, planners focus on a range of plausible climate scenarios covering a wide range of uncertainty. Impacts are then projected across the whole range of possible future climates/situations such as a 1, 2 ,or 3 degree temperature changes and 10%/20%/30% increase or decrease in rainfall. One then develops robust adaptation responses to the range of scenarios. Developing an adaptation plan that can handle the whole range of possible future scenarios will ensure the development of a plan with high levels of resilience and a high level of confidence in the ability to face uncertainty. The development of adaptation plans based on sound first principles around good land use management, tested against broad climate model projection scenarios, are likely to be most robust.

#### **Critical Biodiversity Areas Maps and Climate Change Adaptation – Mandy Driver (SANBI)**

CBAs show natural and functional ecological support areas, protected areas, other natural areas, and transformed areas. Advice is offered for natural areas and functional ecological support areas only and aims to help the conservation sector and government prioritise areas for conservation that should not be developed. The number one pressure on biodiversity today is habitat loss. Stewardship is one of the major mechanisms for implementing the expansion of protected areas. Habitat loss cannot be addressed by protected areas alone, so Driver works on mainstreaming biodiversity through other types of development and strategies, along corridors or 'stepping stones'. One core aim is to meet the biodiversity and ecosystems services conservation targets as efficiently as possible, in the smallest area,

and to avoid conflict with other priority land-use practices. Climate change design principles align biodiversity priority areas intact river and coastal corridors, altitudinal gradients, climatic gradients, and high topographic variation.

A core aim is to avoid further fragmentation of the landscape and to use the maps as a tool to ensure that landscapes are as connected as possible. CBAs pursue principles that should be of benefit under any climate change scenario – for example, river and wetlands systems are extremely important to conserve whether you are getting wetter or drier.

SANBI is also in the process of working on a proposal around 'stress testing' to evaluate whether CBA maps really can help to build resilience to climate change. These stress tests will investigate how habitats and biophysical features can be expected to respond to various future scenarios.

### **Towards Protecting Key Climate Adaptation Corridors in the Western Cape – Onno Huyser (TMF) – with a note on EbA in the grasslands from Brent Corcoran (WWF)**

Onno Huyser presented on a similar approach taken within WWF around the establishment of climate adaptation corridors in the Western Cape. Huyser and his team have identified and assessed land-use corridors taking a first principles approach to climate change and making use of CBA-type maps to prioritise areas within the corridors and allocate resources accordingly. Wetlands, catchments, riparian systems, and estuaries are all critical and form a focal point on the corridor approach taken by WWF and presented here. The 28 identified corridor areas for the Western Cape are assessed according to their conservation significance, competing land-uses and proximate threats, and their predicted level of resilience to climate change. A core aim is to develop an integrated range of social, economic, and conservation activities in the landscape. Sub-optimal land is available for restoration and Huyser is looking into cost neutral ways for farmers to go a conservation route.

As part of this presentation, Brent Corcoran also added a note on carbon sequestration in the grassland systems. Well managed, intact, high altitude moist grasslands store a significant amount of carbon (400-500kg CO<sub>2e</sub> per hectare). Well managed commercial livestock lands can also achieve this. Corcoran is involved in a process of evaluating the impact of stock reduction and increased basal cover on carbon return. A highly degraded baseline will be used to demonstrate carbon return through sound management. While land based approaches are important from a conservation perspective, Corcoran reminded everyone that reducing emissions quickly is vital. Soil and landscape carbon sinks such as that mentioned above cannot cope with emissions in excess of 30 million tonnes of carbon per year for long.

Corcoran made various suggestions for better land use practices in the grasslands including accounting for differences in emissions due to feed production and transport in range-fed and feedlot beef production, responsible stocking rates and burning regimes, and changes in supplementary feed types. His Ekangela strategic study area is investigating which sub-catchments have highest priority values for conservation and stewardship activities and the best ways to motivate for better land use management.

Again, the tool used is biodiversity stewardship and land-use planning to inform risk management, policy making, and action on the ground.

### **An Assessment of Existing CAP EbA sites – Dr Richard Lechmere Oertel (BPM)**

Richard Lechmere Oertel is conducting research for CAP, assessing the EbA sites established to date in KZN, and the Eastern Cape largely through opportunistic rather than strategic means. Oertel will be evaluating how effective these sites will be for adapting to climate change, looking at current conservation plans and climate models to determine the best sites for adaptation, and designing monitoring and evaluation processes within existing and additional sites. The aim is to identify criteria by which to improve site assessment towards more effective selection of adaptation sites in the future. Oertel argued that one can gain a lot of knowledge from looking at the landscape and land-use patterns itself, exploring past, present, and future scenarios for these.

Some desirable features to include in an adaptation corridor include crossing bio-geographic zones and macroclimatic gradients, being largely free of alien species, and housing a relatively responsive and resilient population of people. Monitoring and evaluation criteria used to evaluate the effectiveness of corridors will include climatic indicators such as rainfall and temperature, biological indicators such as vegetation boundaries and indicator species, ecological indicators such as the presence of aliens and C3 to C4 species shifts, and socio-economic indicators such as yield increases and land-use changes.

### **Green Choice Monitoring and Lessons Learned – Dr Heidi Hawkins (Green Choice)**

Heidi Hawkins gave an overview of ecosystem based green economies in South Africa, including potatoes, rooibos tea, citrus, and lamb. The Cape Floristic Region initiatives (potatoes, rooibos, wine, flowers, and citrus) have shown some conservation and socio-economic gains since the beginning of the programme. Green Choice has developed tools for farmers to use to track and monitor their initiatives and have developed best practice guidelines for each industry. These need to be integrated with existing industry audits and agricultural extension activities. Monitoring and evaluation should involve the minimum amount needed to demonstrate an outcome or impact. Criteria should be appropriate to the process being monitored and feasible within the available budget and capacity. Criteria should also be established through consultation with those implementing the strategies/changes. To date, Green Choice has largely been dealing with farmers that have already bought in to a biodiversity approach to some extent and are fairly well-resourced.

## ***SESSION 2: OUTCOMES OF MONITORING CRITERIA WORKSHOP***

### **Adapting to Climate Change: monitoring of corridor and restoration areas and people adapting to climate change – Sarshen Marais (CAP)**

Sarshen Marais commenced the monitoring criteria workshop section of the morning with a presentation on monitoring climate change adaptation. Robust monitoring and evaluation criteria are needed, which are integrated into management plans, in order to be able to track changes over time and measure the impact of adaptation interventions. M&E frameworks for EbA must look at both biodiversity and people. Marais suggested types of indicators that could be used to measure climate change, changes in biodiversity, social criteria, and the effect of restoration efforts and corridors. She suggested that data collection for M&E be done by resident communities as far as possible, with less frequent scientific monitoring for verification.

Marais posed a set of questions to the audience around M&E criteria for climate change monitoring and asked groups to discuss and report back. The results of this discussion are summarised below.

### **Outcomes of the workshop session and debate**

The delegates worked in three large groups discussing M&E. The key questions posed to them were:

- What are the key questions we want answered to demonstrate how the people in our projects are adapting to climate change?
- At what scale can monitoring take place? Can local communities carry out monitoring? What aspects of this? And how?
- Identify important criteria and indicators for monitoring adaptation to climate change in people/projects/corridors/restoration sites.
- Identify any key datasets that could be valuable resources.
- What should we **not** be monitoring?

The questions elicited responses around monitoring climate change for biodiversity conservation, land use and management, and socio-economic development. Responses on the kinds of things the conservation sector and other EbA practitioners should be monitoring are summarised below.

### **Themes, questions, and recommendations emerging from the closing discussion included:**

Alien and invasive species: Management of these is key but at what level? What are the actual tangible and measurable benefits from alien species control? Can alien species be used to buffer

indigenous ecosystems particularly around resource harvesting by local communities? What are the impacts of current alien removal practices on the systems that they are removed from?

**Appropriate technologies:** appropriate alternative technologies, tools, and methods for EbA must be identified and should be piloted in a variety of contexts.

**Availability of alternative energy:** alternative energy sources such as wind and solar are important features of a more resilience lifestyle. Levels of availability and accessibility of such technologies should form an important part of EbA assessments.

**Benign land use practices:** what is the impact of these on EbA? Important to monitor the effectiveness of any intervention of change in land use practices to ensure that recommendations made do actually result in a demonstrable increase in resilience to the impacts of climate change. Useful to evaluate these against baseline controls.

**Community impacts and accessing local knowledge:** Localize adaptation solutions. Capture and collate successful measures used to historically adapt to and survive under extreme weather/climatic conditions. Record anecdotal evidence of climate variability and change and the impact of interventions. Interrogate the land use practices and adaptation strategies people have engaged in over time, and look out for what works, what endures, and why.

**Compounding threats:** Climate change is likely to act as a risk multiplier, adding an additional layer to already stressed ecosystems and vulnerable communities. Detailed risk and vulnerability assessments will therefore be important tools in EbA assessments and the monitoring of EbA projects and programmes.

**Disaster Risk Management:** there is an opportunity for EbA approaches to be incorporated into national, regional, and local government DRM planning processes. Quantify the loss of services in terms of built infrastructure and soil. For example, what are the actual costs of the losses due to flooding and can this be linked back to vegetation loss? What will be the expected impact of any structural or non-structural buffering interventions and what are priority areas for investment?

**Diversification of livelihoods:** opportunities for sustainable development and a green and conservation based economy lie in the diversification of livelihoods strategies to incorporate stewardship, eco-tourism, nature conservation, management of natural resources and ecosystems services, carbon financing and so on into more traditional livelihoods. There is a need to identify what should be measured in terms of socio-economic benefits by communities and how such indicators relate to adaptive capacity and resilience in a context of climate change. Likewise, what qualifies as a socio-economic benefit in EbA?

Evaluation of vegetation alone is an insufficient indicator of ecosystem health. Other species, such as birds, should also be monitored.

Financing: opportunities for financing around EbA exist but there are also many opportunities to act, particularly in the enabling environment, that do not require large additional funds.

Identify particular local stresses, assets, and opportunities

Identify priority areas: there are tools and methods available tools such as CBAs that can help with the identification of key priority areas and assist with the allocation of limited resources to achieve greatest benefit.

Impact of extreme events and the influence of human action on the landscape needs to be monitored: evaluate changes within and outside of designated corridor areas, make use of baseline controls, and refer to historical records, patterns and trends.

Levels of productivity: monitoring these can be useful indicators of the effectiveness or sustainability of EbA approaches.

Motivation for changes in behavior and practices: it is not sufficient to simply note that practices have changed or to speculate on the reasons for this. Interviewing farmers and other landowners around their decision-making processes will likely be a very useful M&E tool.

Municipal engagement: municipalities currently lack the capacity to carry out M&E or to enforce standard best practice in their districts. While the ultimate goal is to hand over much of M&E to municipalities, NGOs can achieve much by working within and alongside existing municipal structures and processes..

Need for more basic environmental data: the collection and analysis of core biodiversity and physical features and processes data remains central to any successful EbA approach.

Prioritise worst offenders: identify the worst offenders in terms of unsustainable land use practices and target these individuals, communities, or corporations first.

Raising awareness remains key. Environmental education and capacity building for teachers and trainers around EbA to climate change are central.

River system, wetland, estuary and catchment health should be prioritised, and appropriate action in such areas now will provide buffers for people and biodiversity whether South Africa

experiences wetting or drying under climate change. Water availability is a top priority in the South African context.

## CONCLUSIONS

In summary, ecosystem based adaptation can be seen as a strategic approach to adaptation that considers ecosystems and their services and assists people and nature to better respond to the impacts of climate change. In South Africa and other countries EbA is being successfully implemented but policy needs to support these pilot studies so that large scale approaches are administered, and so that development planning considers ecosystem approaches and assists us in managing the risks associated with climate change while also reducing impacts and even preventing disasters where possible.

Finance mechanisms such as REDD+ are being developed and the UNDP Adaptation Fund is now accessible to all African countries. Such mechanisms should be accessed for support, but local incentives and finance mechanisms should also be developed and supported to enhance local capacity and ensure that we are not completely reliant on international funds to support our efforts. Lastly, monitoring for adaptation is critical. We must monitor both how nature is adapting and how people are adapting and ensure that the effect of our conservation efforts on people and the landscape is well documented and well understood. This will assist with future planning and approaches and increase resilience.

Thank you to all who presented and participated in this exciting and fruitful workshop.

To access PDF versions of the presentations, please see the CAP website: [www.cap.org.za](http://www.cap.org.za).