Biodiversity, Climate Change and Sustainable Development

Harnessing Synergies and Celebrating Successes

FOREWORD BY MINISTER....

I am delighted to provide some thoughts for the foreword of this engaging piece of communication about the value of biodiversity and ecosystems in helping people adapt to the adverse impacts of climate change. With so much focus on the extremely challenging task of achieving a fair and balanced mitigation outcome under the UNFCCC, the positive messages that are emerging from the adaptation disciplines are too easily overlooked. Many nations through the ages have learned to their detriment the folly of ignoring the value of biodiversity and ecosystems. History and archaeology tell us that some did not learn this critical message, with disastrous consequences for their societies, especially when climate changed due to natural causes. In a time when we know that our actions are causing climate change, this message is doubly important.

Rich biodiversity and healthy ecosystems provide services that help us both to adapt to and to mitigate against climate change. This paper makes this fact abundantly clear, and through its focused selection of case studies, points the way to a positive and encouraging message that is emerging from African experiences. These are rewarding experiences in the harnessing of the value of ecosystem services to provide natural solutions to our climate change challenges. But more than this, the paper describes how even greater synergies can be achieved – including those that lead to safer and more secure livelihoods especially for the poor and vulnerable, economic diversification, poverty alleviation and job creation.

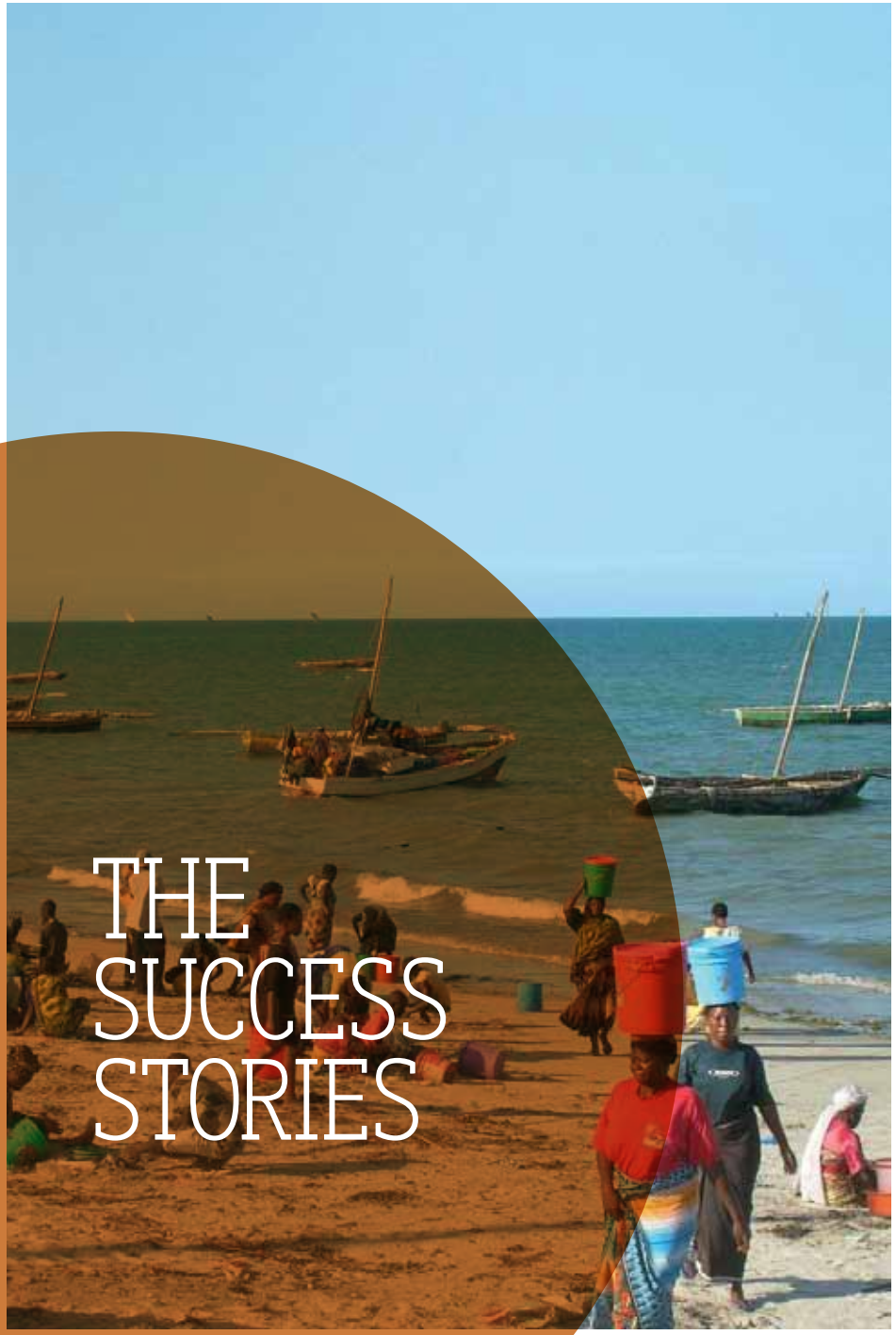
Ecosystem based adaptation will surely become one of the key pillars in the adaptation strategies of all nations of the world, and we are proud that the African continent is able to provide some of the early examples of the successes that can be achieved. I trust that the release of this booklet, its accompanying technical paper, and the public side event associated with this work at COP17 in Durban will represent an important milestone in advancing the understanding and implementation of ecosystem based adaptation, and the value of ecological infrastructure and natural solutions to environmental challenges that are of our own making.

BIODIVERSITY AND HEALTHY

well functioning ecosystems provide natural solutions that build resilience and help society adapt to the adverse impacts of climate change. They also support poverty alleviation by providing safer and more secure livelihoods, especially for the poor and vulnerable.

With climate change already well underway, and further change unavoidable, adaptation is gaining significantly more focus. Adaptation is of particular interest to African countries, which are amongst the most exposed and most vulnerable. African people and African ecosystems have been coping with significant climate variability for millennia, and in Africa there is therefore the potential to gain insights for adaptation strategies under future climate change. There is also a growing understanding of the potential role of ecosystem services in enhancing societal adaptation responses.

This paper examines how this value is being unlocked in the African context, and how even greater benefits could be realised. This is achieved by analysing a small number of diverse success stories that combine biodiversity conservation, human socio-economic benefits and climate change adaptation outcomes, to see what lessons can be learned from them, and how best practices could be defined to strengthen current activities and provide guidance to developing new approaches and projects.



THE SUCCESS STORIES

THE SUCCESS STORIES presented here come from different geographic locations across Africa, showcase very different approaches, and therefore provide useful initial insights into the wide variety of project types that are already underway in Africa from which best practices can be developed. These success stories are not without complexity, and the examples indicate their multi-faceted and potentially complex nature. Overall, they illustrate how some of Africa's sustainable development challenges can be effectively addressed through an integrated approach that responds to the triple challenge of socio-economic deprivation, ecosystem degradation and adverse climate change impacts

These case studies show how conserving and enhancing biodiversity and ecosystem services can generate services that can help society to adapt to the adverse effects of climate change.

SUCCESS STORY 1: CONSERVATION OF COASTAL ECO-SYSTEMS IN TANZANIA

Ecological infrastructure creates natural buffers that enhance resilience to extreme weather events associated with climate change. The Pwani project works to reverse the trend of environmental destruction of critical coastal habitats in Tanzania, while at the same time sustaining the flow of environmental goods and services and improving the livelihoods of residents in the Bagamoyo-Pangani and Menai Bay Seascapes. The coastal habitats are biodiversity-rich areas, with estuaries, mangrove forests, beaches, seagrass beds, coral reefs, coastal forests and threatened wildlife species. These coastal ecosystems also provide income, food and trade opportunities for local communities and can help buffer the effects of climate change including storms, severe weather events and sea level rises. Healthy ecosystems are therefore important for both local biodiversity and for the livelihoods of people in the area. The project takes a broad approach, working to create enabling conditions for coastal governance, supporting local participation in natural resource management and addressing socio-economic and other cross cutting issues such as HIV/AIDS, community energy needs and gender equality within the context of climate change.

After one year (end of 2010) the work done through the Pwani project had led to the improved management of 56 414 hectares of biologically significant areas; strengthened 18 local organisations ability to manage threatened ecosystems; reached 1 719 people through community outreach and planning that promotes biodiversity; and trained 602 individuals in coastal governance and MPA management.

Investments in the restoration and enhancement of ecological infrastructure, such as coastal dunes, mangroves, riparian vegetation and wetlands, can complement and even replace other hard/built infrastructure, such as sea walls, dams and gabions. Such approaches can provide labour intensive and cost effective adaptation responses.

SUCCESS STORY 2: SOUTH AFRICA'S ENVIRONMENTAL EXPANDED PUBLIC WORKS PROGRAMMES GROW THE GREEN ECONOMY

Healthy catchments secure ecosystem services and will be increasingly critical cost effective solutions for water security. In South Africa, invasive alien vegetation poses a great threat to ecosystem services and especially water resources, and it is likely to spread faster in the future due to higher predicted CO_2 levels. South Africa's environmental legislation and constitutional rights to a healthy natural environment to enhance well being, has enabled the creation of a number of programmes have been created under the South African government's Environmental Expanded Public Works Programme. These programmes are aimed at maintaining, rehabilitating or restoring ecosystems and natural landscapes, while at the same time providing livelihood opportunities for vulnerable communities. The various programmes, which include Working for Water, Working for Wetlands, Working for Land, Working on Fire and Working for Energy, all address critical political priorities, including job creation and investment in ecological infrastructure, while at the same time supporting the expansion of South Africa's green economy.

The Working for Water programme specifically involves the creation of work opportunities for people in river catchments to clear alien invasive vegetation, and where possible creates value-add industries that use the harvested wood for wood products and alternative energy sources.

The Working for Wetlands Manalana project shows how the rehabilitation of ecological infrastructure for erosion control, sediment trapping and stream flow regulation provides a more cost effective long-term solution for controlling erosion and sedimentation.

SUCCESS STORY 3: PARTNERING WITH THE PRIVATE SECTOR IN NAMIBIA'S BUSH-TO-FUEL PROJECT

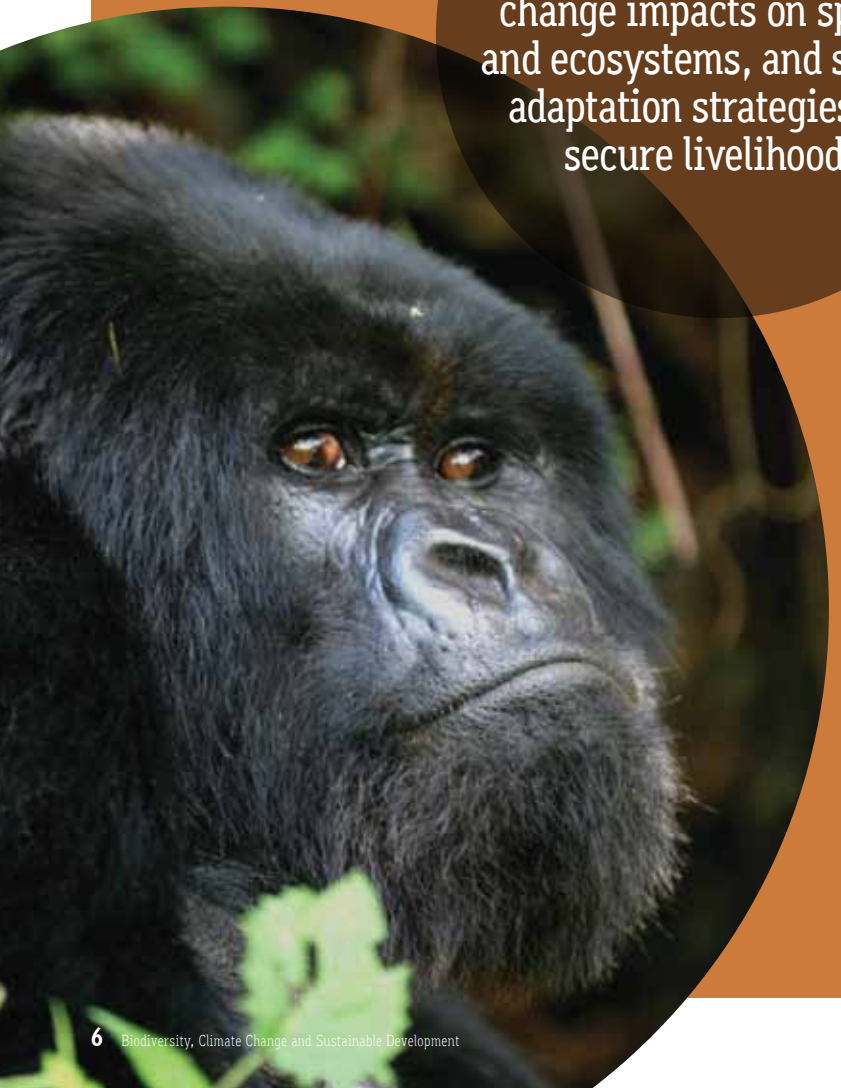
Novel land cover management practices can reduce adverse impacts that are associated with rising CO_2 levels and even unlock benefits. Namibia's Bush-to-Fuel Project addresses the threat of climate-induced bush encroachment while at the same time enhancing livelihoods and ecosystem services.

Healthy catchments secure ecosystem services and are increasingly critical cost effective solutions for water security.

The Bush-to-Fuel project is an example of a private sector investment in renewable energy, whose innovative approach involves the clearing of areas of native invader bush to create multiple societal benefits. Clearing this bush, that is encroaching on wide areas of Namibia, increases grazing productively for livestock farmers and restores open habitat for biodiversity.

Farmers are paid to remove the bush which is converted to wood chips that are used as an energy source in a local cement factory. This multi-benefit project works to mitigate climate change by reducing the carbon dioxide emissions of the cement factory by 130 000 tons, through replacing coal use with wood chips, and addresses the issue of bush encroachment. The project has created 50 direct jobs and 200 additional jobs indirectly, supports a payments for ecosystem services approach and also has the potential to reduce Namibia's energy imports.

Vulnerability assessments reveal climate change impacts on species and ecosystems, and support adaptation strategies that secure livelihoods.



SUCCESS STORY 4: MOUNTAIN GORILLAS, ECOSYSTEM SERVICES AND LOCAL LIVELIHOODS IN RWANDA, UGANDA AND THE DRC

Impact and vulnerability assessments reveal climate change impacts on species and ecosystems, and support adaptation strategies that secure and diversify livelihoods. The Mountain Gorilla vulnerability assessment project focuses on assessing climate change impacts on gorillas, whilst considering a range of climate change scenarios and socio-economic issues related to livelihoods of local communities. The series of steps and adaptation actions outlined in the vulnerability assessment addresses a broad range of aspects that work to conserve biodiversity and ecosystem services and improve local livelihoods, with the Mountain Gorilla a key focus species that provides a strong anchor for a diversity of activities. Many rural communities across Eastern and Southern Africa depend on economies that are based on wildlife tourism, and that are vulnerable to climate induced habitat destruction. The project aims to secure the habitat by developing a good understanding of the future vulnerabilities associated with climate change. In so doing, it also supports and secures ecotourism and its associated livelihood benefits.

This approach is also supported through its link to the National Adaptation Plan of Action in both Rwanda and Uganda, and is making climate links with other sustainable development and conservation policy.

SUCCESS STORY 5: SMALL-SCALE ROOIBOS TEA FARMERS IN THE NORTHERN CAPE, SOUTH AFRICA

Local and indigenous knowledge informs innovative and sustainable land management practices, securing livelihoods and improving food security. Vulnerability impact assessments can also be undertaken with local communities, who have a wealth of indigenous knowledge that has been developed in response to many years of adaptation to climate variability.

With support from provincial government, the non-governmental sector and academic institutions, members of a vulnerable community in the Suid Bokkeveld in the Northern Cape Province of South Africa have over a period of 10 years established and grown a for-profit enterprise, the Heiveld Co-operative. The enterprise specialises in high quality cultivated and wild-harvested organic rooibos tea, and has a strong focus on ensuring that their harvesting methods are sustainable and in no ways harmful to the wild population of rooibos. Through a process of participatory action research, involving farmers, academics, NGOs and practitioners, the Heiveld Cooperative's small scale rooibos farmers continuously work to develop and adapt sustainable practices and strategies, in order to deal with the uncertainties of future climate and the fluctuating business environment. The farmers are also involved in daily climate monitoring and this information informs short and long term farming strategies.

The Heiveld Co-operative has organic and Fairtrade certifications and the capacity to process 100 tonnes of tea per season. This tea realizes premium prices on the local and international market, supporting local economic diversification.

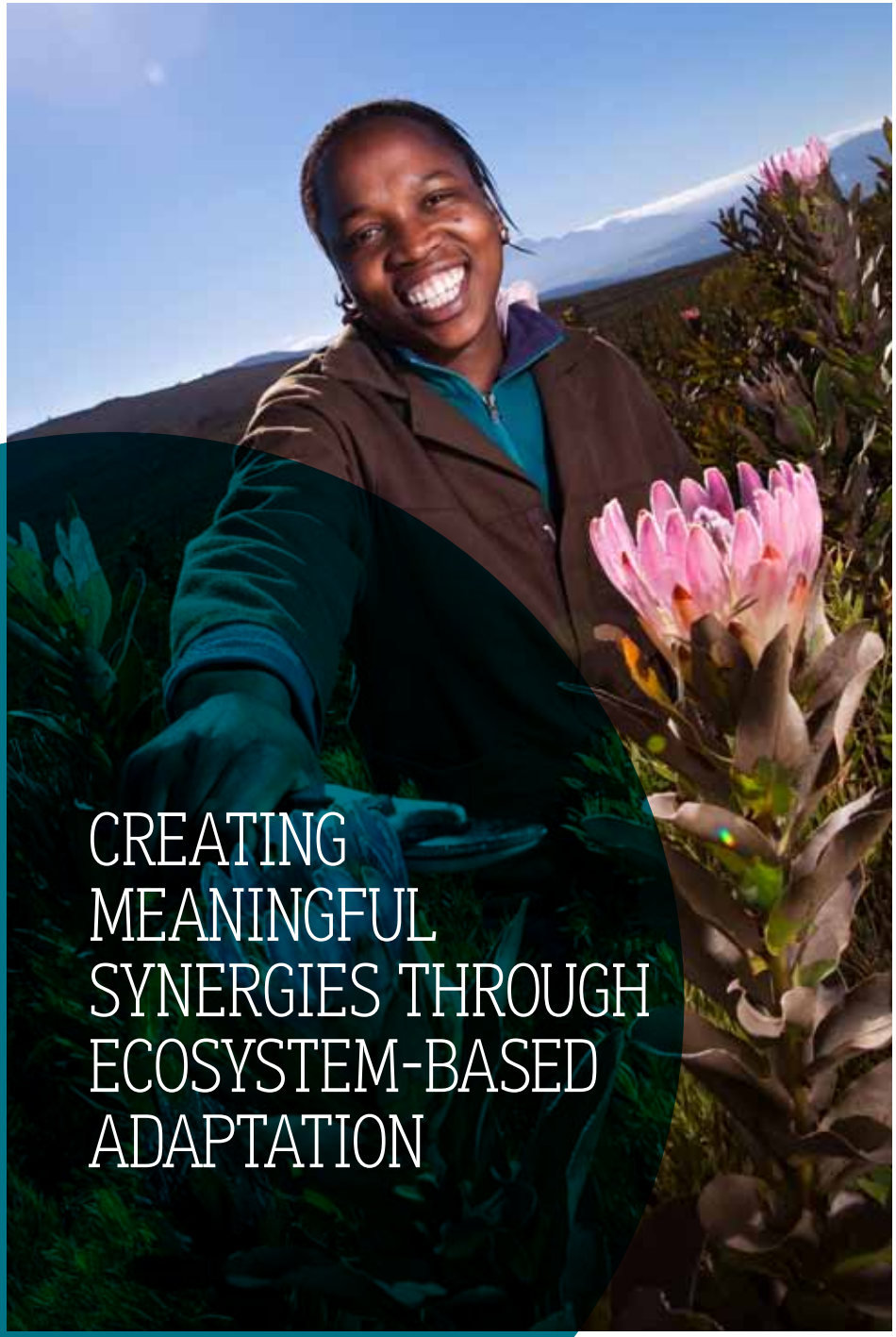
SUCCESS STORY 6: COMMUNITY BASED REFORESTATION IN THE ETHEKWINI MUNICIPALITY, SOUTH AFRICA

Investments in the restoration of natural capital provide complementary adaption and mitigation benefits. The community based reforestation case in eThekwini combines adaptation and mitigation, while addressing issues of ecosystem degradation and poverty.

The eThekwini Municipality has started reforestation projects for which local 'treepreneurs' grow and trade indigenous trees for goods such as bicycles, school fees and staple food. Reforestation works to increase the resilience and adaptive capacity of ecosystems, while providing increased ecosystem goods and services that benefit local communities. The municipality is working towards certifying the reforestation under the Climate, Community and Biodiversity Standard (CCBS), through which the carbon sequestered, can be measured and verified and used to offset CO_2 emissions. The CCBS process supports a robust monitoring protocol, facilitating easy identification of project outcomes including livelihood benefits.

Reforestation through well designed Reduced Emission from Deforestation and Degradation (REDD) projects has the potential to generate income through the carbon markets. This can provide dependable financial resources for local communities, thereby supporting livelihoods and sustainable land management practices.

Indigenous knowledge informs innovative and sustainable land management practices thereby securing livelihoods.



CREATING MEANINGFUL SYNERGIES THROUGH ECOSYSTEM-BASED ADAPTATION

ECOSYSTEM BASED ADAPTATION

is an important approach for achieving multiple benefits in the context of sustainable development. Ecosystem Based Adaptation has been defined by the Convention on Biological Diversity (CBD) as ***"the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change"***. This definition clearly identifies a strong link between biodiversity and ecosystem services, climate change adaptation and societal resilience. This is represented in Diagram 1, which shows the practices of biodiversity conservation, socio-economic development and climate change adaptation in the context of sustainable development, with EbA as a three way synergy at the center of the diagram.

In addition to achieving this three-way synergy, most of the projects reviewed here go even further. There is demonstration of added value provided by further achieving appreciable and virtually immediate livelihood benefits, such as job creation, poverty alleviation and green economy outcomes. The term EbA+ is introduced to denote this added value.

EbA+ moves beyond utilizing biodiversity and ecosystem services as low-cost, low-tech solutions to climate change, showing how investments in biodiversity and ecosystem services can provide direct and sustained livelihood benefits to local communities.

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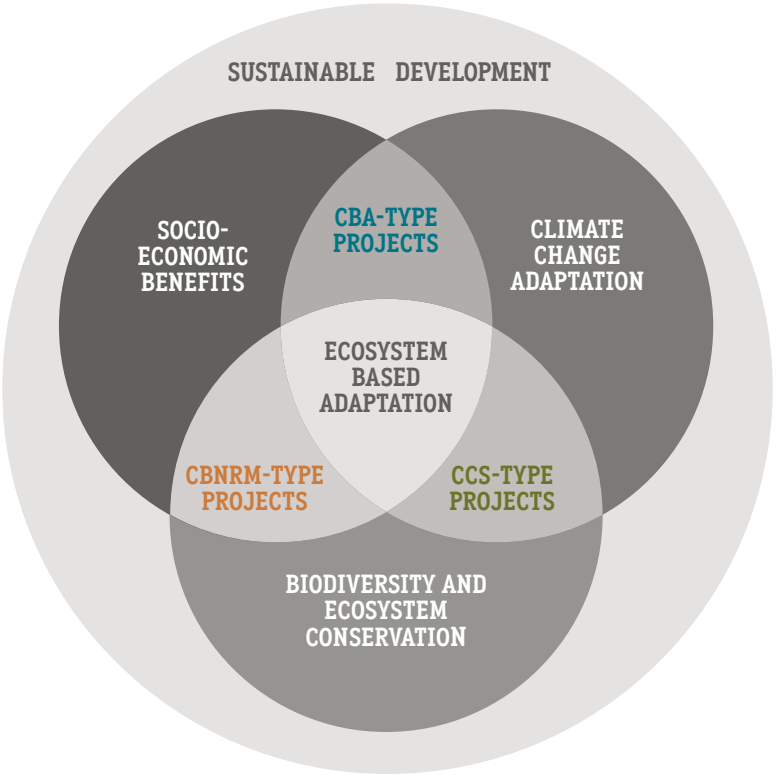

Ecosystem Based Adaptation (EPA) combines the practices of biodiversity conservation, socio-economic development and climate change adaptation. EbA+ builds on this further, to deliver tangible and sustainable livelihood benefits for affected communities. The practices of biodiversity conservation, socio-economic development and climate change adaptation can be paired to create CBNRM-, CBA- and CCS-type projects. EbA may draw from these related approaches, but what distinguishes EbA projects is the combined achievement of all three of these outcomes. This diagram further illustrates how the existing body of work (e.g. CBNRM-, CBA- and CCS-type projects) can be a platform for EbA.

CBNRM Community Based Natural Resource Management is the management of natural resources by all concerned stakeholders. Communities managing the resources have the legal rights, the local institutions, and the economic incentives to take substantial responsibility for sustained use of these resources (CBNRM Net 2001). **Example:** Co-management of harvestable resources (e.g. fisheries) and protected areas.

CBA Community-based Adaptation projects work to empower people to plan for and cope with climate change impacts by focusing on community led processes grounded in the priorities, needs, knowledge and capacities of communities (Chesterman and Hope, 2011). **Example:** Flood protection strategies that support local communities to construct settlements outside of flood lines or with engineering innovations.

CCS Climate change-integrated Conservation Strategies are climate-resilient conservation plans that often result in spatial and related types of planning products. These guide planning for ecosystem service corridors and protected areas that are resilient to climate change (Hannah et al. 2002a, Hannah et al. 2002b). **Example:** Vulnerability mapping and development of plans for conservation corridors and protected area expansion.

CONCLUSIONS & RECOMMENDATIONS

WITHIN A SUSTAINABLE DEVELOPMENT

context, synergies between socio-economic, conservation and climate change adaptation outcomes can be achieved in a variety of ways. In this context, EbA best practice, and especially EbA+, present significant opportunities for job creation, green economy stimulation, and private sector investment.

There is both an existing body of work that can be developed further, as well as significant scope for innovative Ecosystem based Adaptation implementation activities that could be designed de novo. It is however important to recognise that there is complexity in combining socio-economic development, biodiversity conservation and climate change adaptation outcomes, and this can involve both costs and risks which need to be managed.

To address these costs and risks and implement EbA best practice at scale, the following guidelines are recommended:

INVOLVE RELEVANT STAKEHOLDERS IN INTEGRATED AND ADAPTIVE PLANNING AND IMPLEMENTATION. Projects should involve local communities, integrate indigenous local knowledge and draw on multi-disciplinary stakeholders from the outset.

DEVELOP ADAPTATION RESPONSES THAT ARE LOCALLY CONTEXTUALISED. Take cognisance of relevant climate scenarios and ensure appropriate adaptation approaches – thus avoiding mal-adaptation and reducing short and long term risks.

DEVELOP LINKAGES WITH NATIONAL AND SUB-NATIONAL ENABLING FRAMEWORKS. Projects should draw on and inform relevant international national and local sustainable development, conservation and climate policy. Particular attention should be given to National Adaptation Plans of Action (NAPAs) and prospective National Adaptation Plans (NAPs) for short term and long term planning respectively.

LOCATE ADAPTATION APPROACHES WITHIN THE CONTEXT OF THE BROADER LANDSCAPE. Landscape-wide ecosystem processes and services should be factored into project design and monitored.

SAFEGUARD COMMUNITIES AGAINST RISKS AND COSTS. Build safeguards into projects that ensure that communities do not absorb risks and costs associated with adaptation practices, especially where benefits accrue elsewhere.

CAREFULLY CONSIDER PROJECT FINANCIAL SUSTAINABILITY FROM THE OUTSET. Market mechanisms including Payments for Ecosystem Services have been shown to provide a good basis for financial sustainability, should transaction costs be feasible and local communities benefit directly. Potential sources of public funding such as the Adaptation Fund and Green Climate Fund as well as other mechanisms through government and private sector funding should be considered.

TRACK COST EFFECTIVENESS AND RESILIENCE OUTCOMES. Develop systematic monitoring and evaluation systems to document the cost effectiveness of ecosystem based adaptation solutions in relation to other forms of adaptation. Criteria that demonstrate the benefits of resilience for both people and nature should be developed.

ESTABLISH LEARNING NETWORKS AND COMMUNITIES OF PRACTICE. Learning networks and communities of practice can add value to EbA approaches, and encourage sharing of lessons learned. A new EbA platform that is developed by building on existing regional networks, and international forums such as the Nairobi Work Programme on Adaptation under the UNFCCC could support this community of practice.

In summary, there is great opportunity to scale up existing work and build new EbA approaches. Scaling up can take different forms. It can mean building on the success of, and growing a demonstration pilot to scale, replicating a successful pilot in more areas, or transitioning a project from reliance on donor funding to the generation of self-sustaining income.

The potential of EbA projects to achieve additional socio-economic objectives relating to economic diversification and job creation is recognised in the concept of EbA+, thus enhancing the green economy and supporting poverty alleviation.

In Africa we have shown that, by realising these synergies, we can harness the power of natural solutions to enhance livelihoods, diversify economies and build resilience to a changing climate.

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