



Building climate change adaptation on community experiences

**Nyasha Chishakwe, Laurel Murray
and Muyeye Chambwera**

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For a full list of publications or a catalogue please contact
International Institute for Environment and Development (IIED)
80-86 Gray's Inn Road
London
WC1X 8NH
United Kingdom
newbooks@iied.org
www.iied.org/pubs

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management in southern Africa**

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Acronyms

ACCRA	Africa Climate Change Resilience Alliance
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CBA	Community-based Adaptation
CBAA	Community-based Adaptation in Africa
CBO	Community-based Organisation
CBNRM	Community-based Natural Resource Management
CCA	Climate Change Adaptation
COMESA	Common Market for Eastern and Southern Africa
DRR	Disaster Risk Reduction
FAO	Food and Agriculture Organisation of the United Nations
GCM	General Circulation Model
ICRAF	The World Agroforestry Centre
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
IUCN	The World Conservation Union
LDCF	Least Developed Countries Fund
NAPA	National Adaptation Programmes of Action
NCAR	National Centre for Atmospheric Research
NGO	Non-governmental Organisation
NOAA	National Oceanic and Atmospheric Administration of the United States
NTFP	Non-Timber Forestry Product
REDD	Reducing Emissions from Deforestation and Forest Degradation
SADC	Southern Africa Development Community
SASUSG	Southern Africa Sustainable Use Specialist Group
SIDS	Small Island Developing States
UKCIP	UK Climate Impacts Programme
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wide Fund for Nature

Executive summary

Background and motivation

Climate change adaptation is an urgent, yet insufficiently funded priority for poor communities who are already exposed to existing climatic and non-climatic stresses. Community-based adaptation (CBA) can utilise the opportunities and experiences provided by non-climate initiatives that have enabled these communities to deal with other stresses, and in so doing, have established capacity, institutions and models for communities to deal with a range of stresses with minimum outside support. In southern Africa, community-based natural resource management (CBNRM) has used an incentive-led approach to revolutionise conservation and development by devolving responsibility.

The rationale for promoting cross-learning between CBNRM and CBA is that adapting to climate change is a learning process that involves balancing current priorities and vulnerabilities with addressing the likely impacts of future and yet uncertain climatic trends. Long-term, sustainable adaptation is going to be based on locally-based approaches rather than top-down, externally driven interventions, which are mostly dictated by the flow of external resources. While external resources are key to facilitating communities to adapt to climate change, vulnerable communities cannot sit and solely depend on externally-driven approaches. To compound this, there are no universal and standard tried and tested models for adapting to the climates of the future. In most cases, communities need to build on their experiences in addressing existing climate variability and other livelihood and development stresses. Investments made in building capacity in these areas will generate large multiplier effects as communities transfer and adapt this knowledge and experience to climate change adaptation. This paper analyses the linkages between community-based adaptation to climate change (CBA) and community-based natural resource management (CBNRM) and identifies synergies that enable the two approaches to benefit from each other. Understanding such linkages will promote the transfer of knowledge between climate change adaptation and other fields. The linkages between CBNRM and CBA exist at the operational, institutional, policy and economic levels. While the linkages apply to all countries in all regions, this paper uses southern African experiences to illustrate the potential synergies between the two concepts. It however builds the arguments for such synergies from the conceptual underpinnings of CBA and CBNRM to their practical applications as far as experience with these concepts go. By focusing on community-based adaptation, we cover the majority of the most vulnerable people, and reinforce bottom-up adaptation rather than top-down interventions. It is based on a desktop review of literature on community-based natural resource management and community-based adaptation

as well as several case studies, mostly from southern Africa. It is also based on consultations with key stakeholders in the region and other experts.

CBNRM is now being practised in many regions in different forms, but southern Africa is an ideal case study as it is one of the regions likely to be worst affected by climate change, and which is already suffering from the effects of climate-related stresses, in addition to the fact that it, arguably, has the best model of CBNRM (countries such as Cambodia, Vietnam etc have learnt from the implementation of CBNRM in areas community-based eco tourism, community-based monitoring tools etc). Since 2001, consecutive dry spells have caused wide-spread food shortages for some areas of the sub-region. In 2001 and 2002 six countries in the region faced a food deficit of roughly 1.2 million tonnes of cereals and non-food requirements, costing about US\$611 million (SADC, 2002). The 2002 and 2003 drought resulted in a food deficit of 3.3 million tones, with an estimated 14.4 million people in need of assistance (Kandji *et al.*, 2006). In addition, climate variability has also had macroeconomic impacts on national economies in the region. For instance, the GDP for Zimbabwe dropped by 3% and 11% respectively after the 1983 and 1992 droughts (Kandji *et al.*, 2006). The 1992 drought was estimated to have reduced South Africa's agricultural GDP by about R1.2 billion and caused a 0.4%-1.0% loss in economic growth (Glantz *et al.*, 1997). It also cost Zambia a 39% drop in agricultural output and a 2.8% decline in the country's GDP (Government of Zambia, 1996).

Establishing the linkages between CBNRM and CBA

Practically, CBNRM has a longer history, dating back thirty years with a wealth of case studies and literature, while CBA is a recent and promising growing branch of climate change adaptation, with fewer projects to its credit and less established definitions and concepts. CBNRM is a conservation and development concept. It is based on an incentive-driven notion that assumes that communities tend to sustainably manage their natural resources better in ways, that also result in poverty reduction, if they are in control of those resources, and derive direct economic benefits from them. As a concept, it links rural development and sustainable livelihoods and is further bolstered by Agenda 21 and the UN Convention to Combat Desertification which advocate the combination of community initiatives and devolution of natural resources to local communities. The CBNRM concept is premised on four foundational elements, namely; sustainable use, economic incentives assigned to a resource that enhances the value realised by the community engaged in conservation, devolution of management decisions from government to local institutions, and collective proprietorship (Jones and Murphree, 2004). A key feature of a CBNRM programme in Zimbabwe, CAMPFIRE (Communal Areas Management Programme For Indigenous Resources), is Appropriate Authority Status, which is the conferment of administrative power by a central government body to another body, either to a lower body within the State administrative hierarchy or to a body not within the State administrative hierarchy; to administer affairs that would have otherwise been administered by the government body. Climate change adaptation on the other hand, is defined, for example by the IPCC as, 'adjustment in natural or human systems

in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities'. It mostly aims to decrease vulnerability and increase the resilience and capacity to cope with climate impacts. Increasingly, however, adaptation is being viewed as more inductive in nature, rooted in the existing coping strategies of communities and individuals to risk (Huq and Reid, 2007). Consequently, adaptation policies need not start from scratch as people have been managing climate hazards for centuries; a reality that forms the starting point for approaches such as community vulnerability and resilience frameworks and local adaptive capacity (Prowse and Scott, 2008). The alignment of the climate and development communities to target and utilise development as a tool for adaptation has seen a significant advancement. A straightforward case is made that adaptation is integral to "good development" in the future (Jones *et al.*, 2010). Perhaps the most significant characterisation of adaptation that brings it closer to CBNRM is the concept of adaptive capacity, whose principal determinants the IPCC (2001) identifies as economic wealth, technology, information and skills, infrastructure, institutions and equity. Others include social capital and good governance as additional key components (Adger, 2003; Jones *et al.*, 2010). These are also, arguably, essential to sustainable community-based natural resource management.

While CBNRM has evolved to be an important approach to natural resource management and rural development, which are also critical for adapting to climate change, community-based adaptation evolved from the merger of climate change and development to put community first for CCA. It tackles the traditional top-down adaptation approach. Agrawal *et al.* (2009) cite that '85% of all priority projects as identified by the NAPAs pay little to no attention to local institutions'. CBA targets local communities and institutions, ideally with the aim of feeding into higher-levels as witnessed in CBNRM's own history.

Perhaps CBNRM's most remarkable attribute are the processes and institutions it establishes in order to achieve its results, including the creation of space for the direct and practical involvement of communities; the devolution of power from central government to communities recognised by policy and law; the establishment of mechanisms to ensure the provision of tangible benefits for communities from conservation initiatives; and its capability of replication and diversification to other sectors. Similarly, even in its early stages, the successes of CBA are likely to be hinged on those attributes that enable local communities to be in control of their adaptation, covering various sectors such as agriculture, water, natural resources and others as well as the local institutions that provide the bedding for a variety of adaptation actions.

One area that provides a direct linkage between CBNRM and CBA is ecosystem based adaptation. Ecosystems transcend community and non-community spheres with significant community-ecosystem intersections. They provide goods and services that are essential for many livelihoods in the sub-region including the provision of food, fuel, water, fibre and pharmaceutical products; as well as services such as soil fertility, climate regulation and protection from extreme weather events. Essentially, they contribute to building adaptive capacity while also sustaining CBNRM. An ecosystem

based approach will use biodiversity and ecosystem services as part of an overall adaptation strategy: focusing on those goods and services essential for livelihood.

CBNRM and CBA are both community-focused and community-driven. Both involve a process of empowering communities to identify and manage their resources; and in this way, their goals are complimentary involving many over-lapping approaches and issues. At the heart of both CBNRM and CBA are development and the community. Both stand on community efforts to improve their welfare and are enhanced by underlying physical and socio-economic conditions.

From these analyses, we can conclude that there are linkages indeed between CBNRM and CBA, at least at the conceptual level, forming the basis for drawing some lessons from CBNRM that benefit CBA in its evolution.

CBNRM lessons for CBA

As an evolving field, climate change adaptation, and community-based adaptation in particular, have a lot to learn from the experiences of CBNRM. The lessons learnt from CBNRM case studies in southern Africa have global relevance, and pertain to the four main themes that underpin CBNRM: sustainable livelihoods, incentives, devolution and community proprietorship.

Sustainable livelihoods lessons

- a) Community responses that incorporate sustainable livelihood and environmental management strategies can build community resilience and adaptive capacity that lessen the vulnerability of the community to future climate change
- b) Local capacity is an important factor in enhancing community response to external shocks.

Incentives lessons

- a) In order for communities to be motivated to embrace CBA initiatives, incentives associated with CBA should be direct and visible
- b) Sustainable household cash income is an important factor in enhancing community capacity to respond to and cope with vulnerabilities caused by climate change-related factors.

Devolution lessons

- a) The institutional architecture in CBA projects should not only consist of new project-established structures; but should also recognise and include existing traditional institutional structures for the projects to be effectively implemented
- b) It is important for CBA institutional arrangements to be inclusive and create space for all relevant stakeholders; such as elected representatives, community members, NGOs and the private sector; to participate.

Community proprietorship lessons

- a) Traditional leadership can play an important role in signifying and symbolising community ownership over CBA projects
- b) Social capital elements such as 'relationships of trust' between the community and its traditional leadership and between the traditional leadership and CBA project implementers can be important factors in promoting communal proprietorship over CBA initiatives.

CBA lessons for CBNRM

While in the short term, it is mostly CBA that will learn from CBNRM because CBNRM has been around for a longer period, it is expected that in the long run, the implementation of CBA will generate important lessons for CBNRM, and it is critical for CBA to integrate this learning from the onset. The earliest lesson for CBNRM is its need to build in climate change adaptation as early as possible as both the communities and the natural resources are exposed to climate change, and to screen out mal-adaptive natural resource management activities. CBA is also leading the way in creating global presence through annual CBA conferences that bring together stakeholders from different communities to learn from each other while promoting the CBA concept. Such processes also help develop a common global understanding of the concept and how to replicate it elsewhere (with adaptations of course).

Getting CBA to work

CBNRM started as small, isolated pilot projects that were taken up by several communities and countries over a long period of time. It is now operating at local, national and regional levels. While CBA is mostly in pilot stages dependent on external donor funding, its wider uptake and upscaling could learn from the key factors that underpin CBNRM uptake and sustenance at the community, national and regional levels. These factors include:

1. Incentives and costs
2. Enabling policy environment
3. Regional cross-learning, championship and scholarship.

Incentives and costs

Incentives are critical for the uptake of CBNRM, and these incentives have been enjoyed at all levels of resource management, with CBNRM principles dictating the allocation of benefits among different stakeholders. Interestingly, both monetary and non-monetary incentives are critical to CBNRM. In CBA, where benefits are likely to be realised in the long term, short term incentives will be an important driver of autonomous adaptation. These could be in the form of business enterprises that help build adaptive capacity and promote market access and livelihood diversification among others. As adaptation will impose costs on communities, reducing direct costs to communities could be

achieved, as has been done in CBNRM, through a combination of partnerships with the private sector and external support by government, donors and NGOs in areas such as capacity building and infrastructure. With specific reference to southern Africa, and other regions where the policies and institutions for community involvement have been established, working through these models has a huge potential to reduce the transaction costs of CBA.

Enabling policy environment

An enabling environment for CBA is expected to facilitate enhanced resilience of communities and ecosystems to projected effects of climate change. However, since climate change affects communities differently according to their respective vulnerabilities and adaptive capacities, CBA programmes will inevitably be local and context-specific. An appropriate and effective enabling environment for CBA should therefore include a policy, legal and institutional architecture that is broad and flexible enough to address these issues. This would inevitably be built around common CBA pillars and objectives, namely:

- a) Responding to community vulnerability
- b) Strengthening adaptive capacity.

Regional cross-learning, championship and scholarship

CBNRM has benefitted from a regional recognition that has led to cross-country learning at practical and policy levels. The existence of a Regional CBNRM Forum for example, is a demonstration of the extent to which the principles and practices of CBNRM are widely shared and subjected to peer review mechanisms across national boundaries. In addition to cross-learning and scholarship, including official CBNRM curricula in tertiary colleges, a CBNRM championship has evolved, as have recognised themes of study. These champions are in communities, local governments, NGOs, universities and central governments. While CBA is still in its infancy, its development in scholarly circles would both enhance its sustainability in the long term while refining it through rigorous academic and applied scholarship. Emerging programmes such as ARCAB (Action Research for Community-based Adaptation in Bangladesh) which seek to pursue long-term research have the potential to promote such scholarship and championship. Similarly, global championship could also be developed through the thematic research areas of ARCAB as well as through the annual global CBA conferences.

The overall conclusion of this paper is that CBNRM and CBA can build on their respective synergies, with the experiences from CBNRM providing a strong basis for building a strong CBA foundation, underpinned by principles that enhance community adaptive capacity such as sustainable livelihoods, community incentives, devolution of responsibility to the local levels and community proprietorship. Wider uptake of these and other CBA principles will be supported by conducive policies and building of CBA championship and scholarship. As CBNRM has moved beyond project mode into

a movement that is sustained by its own ideals and independently managed activities at different levels (though donors continue to be important sources of funding for many CBNRM projects), CBA will also be sustained in the long term by a bottom-up drive centred on community interests and participation rather than solely by short-term projects that do not build long term, broad-based capacity, scholarship and championship.

1. Introduction

The first section introduces the concepts and approaches of CBNRM and CBA, showing how the learning and experiences from CBNRM can feed into the effective application of CBA. This is followed by some background to the research on which this publication is based.

This section gives some insights into climate change in southern Africa. It shows how community-based approaches are well-grounded in the development initiatives in the region, providing community-based adaptation with a foundation.

1.1 Concepts and approaches

1.1.1 Community-based Natural Resource Management (CBNRM)

CBNRM is a conservation and development strategy premised on an incentive-driven philosophy that recognises how conservation of natural resources links with rural development and sustainable livelihoods. It is based on the assumption that communities with responsibility and authority over natural resources tend to manage them sustainably in ways that also result in reduction in rural poverty when they are in control of those resources and derive direct benefits arising from their use. CBNRM is further bolstered by Agenda 21 and the UN Convention to Combat Desertification which advocate the combination of community initiatives and devolution of natural resources to local communities. The CBNRM concept is premised on four foundational elements, namely;

1. Sustainable use as a conservation paradigm for ecosystem protection,
2. Economic incentives assigned to a resource that enhances the value realised by the community engaged in conservation,
3. Devolution of management decisions from government to local institutions,
4. Collective proprietorship (Jones and Murphree, 2004).

1.1.2 Climate change

Climate change is defined as the change in the statistical properties of the climate system when considered over periods of decades or longer, regardless of cause (Houghton, 2001). The UNFCC however defines it as ‘a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.’ In the latter sense climate change is synonymous with global warming.

1.1.3 Community-based Adaptation (CBA)

CBA is a bottom-up approach that places the community at the centre of determining how to respond to the impacts of climate change. Distinct from costly top-down approaches, CBA emphasises community participation that builds on the priorities, knowledge and capacities of local people. These include aspects relating to the development and transfer of technology to improve adaptive capability and the ascertainment of community vulnerability through assessments of risks that communities face, amongst many others. As a development-related concept, CBA is a relatively new approach that is still evolving.

ascertainment of community vulnerability through assessments of risks that communities face, amongst many others. As a development-related concept, CBA is a relatively new approach that is still evolving.

Thus, it is inevitable that it faces ‘teething’ challenges, especially with scaling up with larger projects and widespread institutional change. These challenges justify the quest for proponents and implementers of this concept to learn from well established community driven ‘bottom-up’ approaches such as CBNRM.

1.1.4 Cross learning

Although questions regarding the effectiveness of CBNRM in practice have been raised in some instances (Oates 1999; Terborgh 1999 and Rihoy and Maguranyanga 2010), this does not discount its conceptual value to influence and enhance the effective application of CBA at the local level. Indeed, even the mistakes of some CBNRM projects can provide pivotal lessons for CBA in the future.

1.2 Purpose and scope of study

This study examines and documents the linkages and synergies between CBNRM and CBA. It concentrates on CBNRM case-studies, using experiences from southern Africa, to identify important theoretical and practical best practices which can inform CBA. While this represents its primary focus; the paper also raises key issues that may be the subject of further specialised research on CBNRM and CBA linkages. It is organised into four substantive sections. The first section begins by juxtaposing the theory and practice of CBNRM and CBA through the lens of their respective evolutionary progression. The purpose of this analysis is to develop and present an analytical framework that will be the basis of understanding the conceptual linkages between them. The second section is the heart of the paper, as it identifies and outlines lessons for CBA drawn from the practical implementation of CBNRM in southern Africa. Through the use of case studies it provides a deeper understanding of the specific aspects of CBNRM that can benefit CBA. The third section focuses on the practical appreciation of lessons learned from CBNRM experiences and how they can be used to make 'CBA work'. As such it concentrates on incentives and costs, an appropriate and enabling policy environment and regional cross-learning and championship approaches that are necessary to advance CBA. The fourth section is on the 'way forward' for the Regional CBNRM Forum for southern Africa. It provides strategic information for up scaling the work of the Regional CBNRM Forum in southern Africa, specifically focusing on tools for integrating adaptation into CBNRM programmes; methods and approaches of engaging with institutions involved in adaptation activities; and funding opportunities for adaptation work in the region.

1.3 Background

This study was commissioned by the World Wide Fund for Nature (WWF)'s Regional CBNRM Forum in collaboration with the International Institute for Environment and Development (IIED). The project, under which the study was launched, aims to analyse and document the linkages between and the contributions of CBNRM to CBA, using experiences and knowledge from southern Africa.

1.3.1 Climate change context in southern Africa

Climate change poses, arguably, one of the most serious threats to human survival, affecting various sectors including food security, natural resources, human health, economic activity and physical infrastructure. Its causes and impacts are multi-faceted and exist at local, national and international levels. In the southern Africa sub-region, climate change is evidenced by temperature increases of over 0.5° C over the last 100 years (IPCC, 2001). It has also been characterised by a downward trend in rainfall (NCAR, 2005). For instance, between 1988 and 1992, over 15 drought events were reported in various areas of the sub-region (Glantz *et al.*, 1997). It is widely accepted, based on future climate modelling findings that the sub-region's climate will be hotter and drier in the decades to come. Ragab and Prudhomme (2002) observed that by 2050, the sub-region's average annual temperature is expected to increase by between 1.5°C and 2.5°C for countries in the southern end of the sub-region and by between 2.5°C and 3.0° C for countries in the northern end compared to the 1961-1990 average. More recent climate modelling findings from the National Centre for Atmospheric Research (NCAR) and the National Oceanic and Atmospheric Administration (NOAA) of the United States revealed 'very clear and dramatic warming of the Indian Ocean into the future, which means more and more drought for southern Africa' (NCAR, 2005)¹. The findings show that monsoons across southern Africa could be 10% to 20% drier than the 1950-1999 average. Annual regional precipitation is expected to reduce by 10%, with greater reductions in the northern part of the sub-region than in the southern part (Ragab and Prudhomme, 2002).

These combined changes will have long-term implications for the viability of ecosystems in the sub-region (FAO, 2010). This is because, as climatic patterns change, so too will the spatial distribution of agro-ecological zones, habitats, distribution patterns of plant diseases and pests, fish populations and ocean circulation patterns which will all impact agriculture and food production (FAO, 2010). These effects are presently being experienced in the sub-region. For instance, the El Niño related droughts that occurred between 1965 and 1997 resulted in significant decreases in agricultural production

that accentuated food insecurity in the sub-region. In particular, the warming of the Pacific Ocean in 1991 and 1992 caused one of the worst droughts of the last century (Glantz *et al.*, 1997). These events resulted in crop losses and death of cattle herds that subsequently led to widespread food shortages. Since 2001, consecutive dry spells has caused wide-spread food shortages for some areas of the sub-region. For example, in 2001 and 2002 six countries, namely Lesotho, Malawi, Mozambique, Swaziland, Zambia and Zimbabwe, faced a food deficit of roughly 1.2 million tonnes of cereals and non-food requirements. These were estimated to cost US\$611 million (SADC, 2002). The 2002 and 2003 drought resulted in a food deficit of 3.3 million tonnes, with an estimated 14.4 million people in need of assistance (Kandji *et al.*, 2006). For Small Island Developing States like Mauritius extreme climatic events have led to a mean sea level rise of 1.2mm over the past decade. It is expected that sea level rise will lead to saline intrusion, contaminating freshwater coastal aquifers along the coasts. Additionally, much of the prime agricultural land is located on the coastal plains which are threatened by sea level rise. It is forecasted that sea level rise will inundate certain low lying coastal areas thereby affecting coastal wetlands and mangrove areas which are important nursery grounds for fish and other marine species (Government of Mauritius, 2009).

In addition, climate variability has also had macroeconomic impacts on national economies in the region. For instance, the GDP for Zimbabwe dropped by 3% and 11% respectively after the 1983 and 1992 droughts (Kandji *et al.*, 2006). In South Africa, the 1992 drought was estimated to have reduced the agricultural GDP by about ZAR1.2 billion and caused a 0.4%-1.0% loss in economic growth (Glantz *et al.*, 1997). The same drought cost the Zambian government US\$300 million, which caused a US\$1.7 billion deficit in 1992 and translated into a 39% drop in agricultural output and a 2.8% decline in the country's GDP (Government of Zambia, 1996). It has also been argued that the prevalence of El Niño in the region is likely to scare off potential foreign investors who would not want to risk business ventures in an 'unfriendly' environment (Kandji *et al.*, 2006). For example, the months preceding the 1991 and 1992 El Niño were characterised by a downward trend in the Zimbabwe stock exchange. During the drought, the country's stock market declined by 62%. Other sectors such as desertification and the conservation of forest and wildlife resources, are impacted by pressures and conflicts created by demographic change as a result of climate variability.

1.3.2 Responses to climate change

The key societal response options for reducing climate change-related risks are mitigation of climate change and adaptation to climate change. Climate change mitigation refers to actions aimed at limiting global climate change by reducing the emissions of greenhouse gases or enhancing their sinks. Climate change adaptation, on the other hand, refers to actions targeted at the vulnerable system in response to actual or expected climate stimuli with the objective of moderating harm from climate change or exploiting opportunities (McCarthy *et al.*, 2001). This second approach: adaptation

- is not a new phenomenon. People and communities in southern Africa have always adapted to variations in their climate by making preparations based on their resources and their knowledge accumulated through experience of past weather patterns (Armitage and Plummer, 2010). They have also reacted to and recovered from climate extremes, such as floods, droughts and hurricanes. However, because climate change poses new threats and new uncertainties, communities' past experience alone can no longer provide a reliable guide to the future (Armitage and Plummer, 2010). This realisation led to the need to develop climate change adaptation approaches (CCA) that are in sync with present realities and that are also 'forward looking'.

End notes - Introduction

1. Cited in Kandji *et al.* (2006)

2. CBNRM and CBA: theory and practice

The following section tracks the main ideas within climate change adaptation and the evolution of CBNRM and CBA in order to distill the key goals and processes embedded in both. From the outset, CBNRM has a longer history, dating back thirty years with a wealth of case studies and literature, particularly in southern Africa where it was first developed. In contrast, CBA is a recent and promising branch of climate change adaptation but with fewer projects to its credit and less established definitions and concepts. This makes it especially important to define what we mean by CBA to inform the study and identify the key indicators of adaptation which are used in the analysis. The final part of this section brings both tracks together to outline the case that CBNRM can contribute to robust CBA projects and that CBA can offer important insights for CBNRM in a changing climate.

2.1 Evolution of CBNRM

CBNRM is a natural resource management and rural development approach that rose to prominence in the 1980s. It is premised on the assumption that if communities are bestowed with the responsibility and authority over natural resources, they tend to manage them sustainably because they derive direct benefits arising from their use. The genesis of this approach can be traced back to the epoch that saw the emergence of the philosophy of 'popular participation in development and planning' (Murombedzi, 1998). This thinking denoted the need to consider devolution of management and control from the State as a mechanism to ensure community participation in natural resource management. The rising prominence of markets as the primary regulatory mechanism in natural resource management during this period, on the other hand, further buttressed the need for this approach. Murphree (1996) refers to this thinking as 'conservation with the people', as opposed to 'conservation for the people' (i.e. State management of natural resources).

Although there has been debate about what constitutes Community-based natural resource management (CBNRM) (Murombedzi, 1998), it is now almost universally accepted that it refers to the devolution of control and management authority over communally held resources. Jones and Murphree (2004) identify four conceptual foundations upon which it is based, these are namely:

- a) Sustainable use as a conservation paradigm
- b) Economic incentives by the community in conservation or management of natural resources
- c) Devolution of rights and management decisions from government to the appropriate local unit for sustainable resource utilisation and management
- d) Collective proprietorship for defined groups of people to utilise and exercise their rights over resources based on their rules, social norms and strategies

2.1.1 The origins of CBNRM

CBNRM as we understand it today applies differently in practice across the world depending on the peculiarities and persuasions of each case and/or country. This variation reflects the fact that, far from being prescriptive and rigid, CBNRM is a concept that establishes basic minimum principles that guide communities in the sustainable management of natural resources and the enhancement of livelihoods. Notwithstanding this flexibility and diversity in its application, it is important to acknowledge that it

has an origin that informs its current philosophical thrust. The origins of the foundational thinking around CBNRM are predominantly based on experiences in community natural resources and wildlife management in pre and post-independent Zimbabwe.

From as far back as 1941, the idea of promoting a bottom-up approach in natural resource management was introduced through the establishment of Intensive Conservation Areas (ICA) in the country (Child and Barnes, 2010). This was created by the Natural Resources Act of 1941 that gave a legal mandate to local landholders (who were mainly white landholders and farmers, at the time) to oversee the management of natural resources, including wildlife. Institutionally, the landholders were organised into Intensive Conservation Area Committees (ICACs) consisting of elected farmers and ranchers. These were supported at national-level by the Natural Resources Board (NRB). This approach to conservation recorded successes such as controlling over-grazing, tree-cutting and other environmental degradation practices. These mechanisms acquired legitimacy because they devolved power to manage natural resources to landholders (Child and Barnes, 2010).

By the 1950s, this model of natural resource management had not been specifically extended to wildlife. It was not until after the coming into force of the Wildlife Conservation Act of 1960, that the idea of devolution and landholder involvement in the sustainable use of wildlife was introduced. The concept was based on earlier studies that revealed that the widespread neglect and killing of wildlife on private land was due to the fact that wildlife had no legal value to landholders and was therefore competing with 'legitimate' farming enterprises (Child and Barnes, 2010). The Act encouraged the 'sustainable use' of wildlife by landholders through a permit system. The 1960 Act was replaced by the Parks and Wildlife Act of 1975, which in addition to embracing the sustainable use of wildlife concept, also reduced bureaucracy involved in utilising wildlife by landholders². The new Act bestowed private landholders with 'appropriate authority' (i.e. extensive use rights) for wildlife on their land. It also empowered local landholders with authority to control abuses through the ICA and NRB mechanisms. It was also during this period that wildlife was officially recognised as a potentially major and profitable form of land use in non-agricultural ecosystems, in the country and the region. This marked a major shift from earlier approaches that focused purely on conservation; to an approach that was conservation-oriented but driven by economic profitability and market considerations.

Post-independence Zimbabwe in the 1980s saw the increase and appreciation of the profitability of wildlife, particularly through increased demand for wildlife-based recreation and partly from declining livestock profitability (Child and Barnes, 2010)³. Wildlife, as a land use option, came to be viewed as having a comparative economic advantage over livestock because tourism and hunting provided more value and profit than meat production (Child and Barnes, 2010). 'Landholders responded to this by increasing wildlife numbers and enterprises. Wildlife available for hunting quadrupled in fifteen years (Booth, 2000), with higher numbers of more species recorded as early

as the mid-1980s' (Child, 2003) ⁴. These experiences gave rise to the realisation that wildlife could also be used as a competitive land use option in communal areas that were predominantly habited by black communities. This saw the establishment of institutional arrangements for communal areas that reflect the elements of devolution and local participation in natural resources and wildlife management (Campbell *et al.*, 2000). The Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) was established in the mid 1980s based on this apprehension.

CAMPFIRE is widely seen as the forerunner and base model for CBNRM. During its formative stages, it emphasised on empowerment of community members at village level to have control over wildlife and its revenues; and the internalisation of costs and benefits at this level (Child, 2003). It was essentially based on an underlying belief that wildlife was the most sustainable land use option in many of the country's remote communal areas.

Although there were marked similarities between CAMPFIRE and wildlife management devolution programmes of the 1970s, the distinguishing factor between the two is that the former was not only driven by profitability, but also by the need to address poverty alleviation at community level; while the latter was driven by economic benefits for individual landholders. CAMPFIRE is expected to address poverty alleviation through organisational development, community empowerment, and sustainable natural resource management. This is in line with the views of the World Bank when it stated: 'Poverty reduction, broadly defined, requires processes that help people improve their capabilities and functioning, that enable people to take charge of local affairs instead of being supplicants before higher authorities... Local empowerment is a form of poverty reduction in its own right, quite independent of its income effects' ⁵.

Elements of the Initial CAMPFIRE Principles

1. Community participation would be voluntary (or demand driven)

2. The primary objective was to internalise costs and benefits, thus providing a mechanism for sound resource allocation (missing in the predominantly open-access economic institutions that governed the allocation of highly scarce natural resources in communal areas at the time). Proposals were based around the concept of the "Village Company" and included: devolution to small groups, which would be clearly delineated; mechanisms, such as shares, to allocate resources between competing uses.

3. These mechanisms would apply to all resources (land, water, grass, trees, wildlife) with the implication that if wildlife did not have a comparative advantage it should be replaced by a superior land use; i.e. this was about improved resource allocation, rather than wildlife conservation, though the Department believed wildlife was competitive.

4. The major practical challenge was the process of delineating community groups.

Source: Child (2003)

By 1989, CAMPFIRE was formally adopted as an important conservation and rural development programme in the country. In that year for instance, ten districts (additional to the pilot phase districts that commenced earlier) embraced the programme and obtained 'appropriate authority' status.

Appropriate Authority Status

'Appropriate Authority' status refers to the conferment of administrative power by a central government body to another body, either to a lower body within the State administrative hierarchy or to a body not within the State administrative hierarchy; to administer affairs that would have otherwise been administered by the government body. It is, in essence, a manifestation of the concept of devolution.

An example of this can be found in Zimbabwe, where the Parks and Wildlife Act of 1975 (as amended in 1982), conferred administrative responsibilities and privileges on Rural District Councils (RDC) to be custodians of wildlife, fish and plants. The Parks and Wildlife Act therefore made the RDCs 'appropriate authorities' bestowed with de facto responsibilities and benefits associated with wildlife conservation and use.

This is particularly important for community involvement in natural resource management, as it enables them to utilise and exercise their rights over resources based on their rules, social norms, and strategies.

Emergence and Spread of CAMPFIRE in Zimbabwe

Year	Districts Wards	Benefiting Households	Number of Population	Benefiting
1989	2	16	7,861	55,000
1990	12	30	22,040	155,000
1991	12	66	51,938	365,000
1992	12	70	70,610	495,000
1993	12	70	68,798	480,000

Source: Child (2003)

2.1.2 CBNRM programmes in southern Africa

After CAMPFIRE, the southern Africa region witnessed the materialisation of other national CBNRM programmes. These include the Administrative Management Design Programme for Game Management Areas (ADMAD) established in the 1980s in

Botswana's CBNRM programme, Namibia's Living in a Finite Environment (LIFE), and Malawi's CBNRM programmes in the 1990s. Tanzania and Mozambique have relatively recently developed their CBNRM initiatives, which however remain nascent. These programmes have different areas of focus and emphasis, depending on the countries' priorities.

ADMADE for example developed in the 1980s, with wildlife being its primary focus. Initially, the element of devolution was not well addressed until the coming into force of the Zambia Wildlife Act (ZAWA) of 1998. The Act gave authority to any chiefdom in the country to establish a Community Resource Board (CRB) made up of representatives from the community, the local district authority, and the chief. CRBs are empowered to negotiate "co-management agreements" with safari operators, appoint scouts, and develop land-use management plans in consultation with the Zambia Wildlife Authority. ADMADE has promoted the creation of local Village Area Groups to further improve community involvement. Under the Act, the State is still responsible for collecting and redistributing funds, an issue which many have argued alienates the communities from directly benefiting from wildlife revenues (Child and Barnes, 2010). Populations of key species of wildlife, however, appear to be increasing in game management areas, suggesting that ADMADE has been successful in discouraging illegal poaching.

Botswana developed its CBNRM programme during the period 1993-2001. This was done in conjunction with the development of CBNRM-related legislation and policies providing for the rights and responsibilities of communities over natural resources in the country (Arntzen *et al.*, 2007). The laws established 15-year "Community Natural resource management Leases" to be entered into by and between legally registered community trusts and the Land Authority. The leases gave community trusts exclusive use (not ownership) of their area (including controlled hunting areas) for all tourism-related activities, hunting, game capture, and commercial use of veld products. One of the unique elements in Botswana's CBNRM initiatives has been the development of Joint Venture Arrangements between Community-based Organisations (CBOs) and the private sector ((Arntzen *et al.*, 2007). This has had a positive impact on natural resource management, and has brought significant revenues to local communities. In general, 15% of these revenues are used to manage the CBO, and the remaining is used by the community for development projects. The involvement of the private sector, alongside Botswana's liberalised economic policies, has enabled rapid growth in community income (Arntzen *et al.*, 2007).

Namibia formally recognised CBNRM in 1997 through the enactment of a law which provided for devolution in the management of wildlife by communities, provided they were registered as 'Conservancies' (Jones and Mosimane, 2007). The conservancies are bestowed with rights over wildlife and tourism in the designated area. Importantly, all income from resource use goes directly to the conservancy. Any group of persons residing on communal land may apply to have some or all of the area they inhabit declared a conservancy (Jones and Mosimane, 2007). To qualify, the community must:

elect a committee to represent the group; agree upon a legal constitution that provides for sustainable management of hunting and “non-consumptive” uses of wildlife (e.g. tourism); establish a means of managing funds; approve an equitable method for distributing income; and define the geographic boundaries of the proposed conservancy. Conservancies are also given the rights of ownership over huntable game. Namibia’s CBNRM programme has demonstrated significant achievements. Wildlife populations have rebounded due to a decrease in poaching and greater understanding of wildlife’s needs on the part of local communities. Policy reforms have empowered communities economically and organisationally, creating an identity and establishing authority for the conservancies. By 2001, 15 registered conservancies managed over 200,000 wild animals in 40,000km² (Jones and Mosimane, 2007).

Key issues in community wildlife management in southern Africa

Issues	Aspects of issue
Local Capacity	Participation Nature of Resource Base Degree of Communal Cohesion Local Governance
Economic Factors	Nature of Resource Base Markets
Management	Local Governance Adaptive Management Planning and Planning Process Vertical and Horizontal Integration Learning and Diffusion
Politics and Policy	Tenure (Rights of access, Degrees of rights) Framework (Policy, Legislation, Institutions)
Resource Base	Nature of Resource Base Competing Land Uses Conservation Adaptive Management
Outsiders	External Inputs (Funding, Technical Support, Training) Planning and Planning Process
Cross-Cutting Issues	Participation Incentives
Stand-Alone Issues	Community Conservation Protected Areas

Source: SASUSG (1997)

2.1.3 Conclusion

CBNRM has evolved to be an important approach in natural resource management and rural development across the world. What makes it a remarkable model has perhaps less to do with the conservation and rural development results it achieves; but more to do with the processes and institutions it establishes in order to achieve those results, these include:

- a) The creation of space for the direct and practical involvement of communities in conservation and rural development initiatives
- b) The devolution of power from central government to communities recognised by policy and law
- c) The establishment of mechanisms to ensure the provision of tangible benefits for communities from conservation initiatives
- d) Capability of replication and diversification to other sectors beyond wildlife.

2.2 Climate change adaptation

The concept of adaptation reoccurs throughout a diverse range of fields; both within the natural and social sciences. In particular, anthropology, ecology and natural hazards have developed substantial literatures with the last two demonstrating the greatest influence on climate change research. These dual literatures offer different readings of adaptation, which at times, have led to a contradiction within the climate change community. As explained by Smit and Wandel (2006), within the field of ecology, adaptation is framed within biophysical ecological change with a focus on flows of matter, energy and information and related concepts of resilience, equilibrium and adaptive management. In contrast, natural hazards focuses on perception, adjustment and the management of environmental threats. Perhaps the most widespread application is borrowed from disaster risk reduction whereby individuals and households are shaped and constrained by social, political and economic forces, which determine their adaptive capacity to shocks and stresses (See Klein *et al.*, 2003; Schipper and Burton, 2008). Following from this, research into climate change adaptation aims to:

- a) Decrease vulnerability
- b) Increase the resilience and capacity to cope with climate impacts
(see Schipper and Burton, 2008).

The IPCC (2001) defines adaptation to climate change as, 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities'.

Adaptation can be further divided into *ex ante* (anticipatory) or *ex post* (reactive); as well as planned and autonomous adaptation. Traditionally climate change adaptation focuses on anticipatory and planned activities, 'using large-scale modeling of primary and secondary impacts to inform policy choices and expenditure decisions' (Prowse and Scott, 2008; also Smit and Wandel, 2006; Pittock and Jones, 2000). This approach is top-down, prioritising sizeable technological solutions such as infrastructure projects and flood protection (Tanner and Mitchell, 2008). Such work is salient for small island states or communities where the impacts of climate change necessitate extreme interventions; for example, coastal protection (See SIDS Proposal, 1991), advancements in early warning systems and migration corridors (Fankhauser, 1998). The problem, of course, is that this approach to CCA relies on modeling, which has poor resolution (or granularity), and favors costly actions while disregarding socio-economic solutions that may already exist within a population.

Increasingly, however, adaptation is viewed as more inductive in nature, rooted in the existing coping strategies of communities and individuals to risk (Huq and Reid 2007). Such a view of adaptation is less fatalistic, focusing on autonomous adaptation at the micro-level and building bottom-up solutions. As it is often said, adaptation policies need not start from scratch. 'People have been managing (or failing to manage) climate hazards for centuries'; a reality that forms the starting point for approaches such as community vulnerability and resilience frameworks and local adaptive capacity (Prowse and Scott, 2008). This evolution of CCA also challenges the traditional planned/autonomous distinction of adaptation. In the 1990s, planned adaptation generally referred to government interventions by way of laws and programmes; while autonomous adaptation was viewed as "spontaneous" household and community actions. Moreover, planned adaptation was seen as intentional and purposeful while the latter was natural but passive. Such views are pejorative and ignore the interaction between planned and autonomous responses as well as in-built community responses. As we will see, community-based adaptation attempts to tackle the traditional two-track definition of adaptation to support a holistic view of CCA.

Following from this evolution of adaptation, the development community has become an important partner for the climate change community; lending knowledge and expertise based upon past lessons. Indeed, the goals of the climate and development communities often overlap as unsustainable development is not only the underlying cause of climate change, but development pathways determine the degree to which populations are vulnerable to a changing climate (Huq *et al.*, 2006). A useful analogy has often been made – that climate change and development are two sides of the same coin.

'For either process to work, each must reinforce the other' (Huq, *et al.*, 2002). This is especially true southern Africa as the threat of climate change disproportionately falls on poorer communities. The vulnerabilities are particularly striking in the sub-region owing to institutional, economic and environmental factors such as a dependence on rain-fed agriculture, increasing water scarcity, population pressures and land-use change, unequal distribution of resources and globalisation, HIV/AIDS, as well as low-level conflict in some areas. Furthermore, climate change has the potential to undo development which garners the greatest attention from governments and civil society in the region.

The alignment of the climate and development communities to target and utilise development as a tool for adaptation has seen a significant advancement. A straightforward case is made that adaptation is integral to "good development" in the future (Jones *et al.*, 2010). The argument being that addressing the underlying conditions of poverty and vulnerability will help people and communities to respond to changing hazards and a changing climate (Jones *et al.*, 2010). This has led to the study of local adaptive capacity which is a compelling framework of analysis, yet difficult to define or measure in absolute terms⁶. The IPCC (2001) identifies economic wealth, technology, information and skills, infrastructure, institutions and equity as the principal determinants of adaptive capacity. Others include social capital and good governance as additional

key components (Adger, 2003; Jones *et al.*, 2010). ‘Much of the focus in assessments of adaptive capacity has been at the national level, with a heavy emphasis on assets and capitals with the notable exception is the National Adaptive Capacity Framework, which focuses purely on a ‘function- based approach’ (WRI, 2009). Important elements of local adaptive capacity include access to and control over natural, human, social, physical and financial resources as well as knowledge co-production, learning and collaboration.

Examples of resources affecting adaptive capacity

Human resources Knowledge of climate risks, conservation agriculture skills, good health to enable labour

Social resources Women’s savings and loans groups, farmer-based organisations, traditional welfare and social support institutions

Physical resources Irrigation infrastructure, seed and grain storage facilities

Natural resources Reliable water sources, productive land, vegetation and trees

Financial resources Micro-insurance, possible diversified income sources

Source: CARE International, 2010

2.2.1. Vulnerability and resilience

The climate is changing worldwide and adaptation results not only from the magnitude of the change in a particular area but in the existing vulnerability and resilience embedded in each community. The IPCC (2001) defines vulnerability as a function of the character, magnitude and rate of climate variation to which a system is exposed; its sensitivity; and adaptive capacity. All three factors form the equation: the rate and degree of climate change, sensitivity and adaptive capacity. For southern Africa all three factors form an alarming picture with overwhelming evidence to suggest that the impact for the sub-region will be acute.

These concepts have migrated from the fields food security and disaster risk reduction (See Blaikie *et al.*, 1994). For example, the study of vulnerability through indices and mapping employed by the FAO. Focusing on natural resource management there exist two dominant paradigms (Prowse and Scott, 2008) that have come to shape our understanding of climate change impacts. The first is a traditional, structuralist view in which disasters are caused by extreme natural events with inadequate monitoring and education. The structuralist view favours technology, prediction and bureaucratic organisation to mitigate disasters (Bankoff *et al.*, 2004). The second is a less fatalistic,

behavioural paradigm which emerged in the 1970s and separates hazards from their potential consequence, disasters. The behavioural paradigm puts renewed attention on vulnerability as the defining quality of a population to address how sensitive and responsive a population is to a particular hazard. This approach disagrees over the extent to which a disaster is determined by the severity of the hazard, and instead focuses on the vulnerability of the population and its resilience⁷.

In essence, this debate over vulnerability is a question of emphasis placed upon the external element of disasters (the hazards) or the internal element (the ability of a population to resist and respond to hazards) (Prowse and Scott, 2008). These questions have great resonance for the climate change community; and collectively, offer a holistic view of disaster that combines structural and behavioural characteristics. The IPCC (2001) defines vulnerability as ‘the function of character, magnitude and rate of climate variation to which a system is exposed, its sensitivity and its adaptive capacity’. Put another way, climate change vulnerability depends upon both exposure and sensitivity to changes in climate, as well as the ability to adapt to new conditions (Kelly and Adger, 2000). It factors the sensitivity to an event and the magnitude of the response coupled with the resilience or ease/rapidity of the response to an external event (Moser, 1998). Thus, analysing climate change vulnerability involves identifying both the threat and the resilience or responsiveness in exploiting opportunities, and in resisting or recovering from the negative effects of a changing environment (Moser, 1998). This focus on vulnerability and resilience can enhance other development areas such as CBNRM; providing a framework for studying long-term climate change and greater levels of uncertainty. For example, a CBA pilot-project on Druadrua Island, Fiji, showcased how CCA was integrated into an existing CBNRM structure where participatory decision-making had led to responses to observed climatic changes. Unfortunately, not all these responses were sustainable and the pilot-project highlighted how vulnerability and resilience analysis can identify and prevent maladaptive practices as well as reveal new long-term strategies (See Dumar, 2010).

Examples of factors that influence vulnerability to climate

Institutional Factors	Informal skills local knowledge formal education, skills and technology informal networks formal security networks strength of local institutions
Economic Factors	Labour, health access to natural resources access to communal natural resources, in particular biodiversity access to alternative economic opportunities
Environmental Factors	Risky environments degraded environments high dependence on climate-sensitive sectors and natural resources communal lands and resources

Source: Eriksen and Næss, 2003

Before continuing, it is important to mention that climate change vulnerability can be over-used. Although the marriage between the climate and development communities has enhanced both programmes of work, it would be inappropriate to join the bandwagon or seek new funds for development work that simply add a “climate variability” or “weather” component. Even amongst the emerging CBA projects, there exist many that address weather without taking a long-term view of climate change impacts. For CBA to work effectively, it must tackle climate change vulnerability and resilience with:

- a) Longer timeframes where climate impacts will permanently alter patterns in rainfall, extreme weather events as well as temperature and sea level rise
- b) Increased level of uncertainty in human and natural systems.

In a FAO project in Bangladesh (See Baas and Ramasamy, 2008) early monitoring systems were not just used to improve on current conditions, but General Circulation Models (GCMs) and climate change scenarios were applied to location-specific agricultural impact outlooks and livelihood adaptation options. The project further utilised participatory approaches to facilitate a two-way dialogue of climate information between the community and researchers.

This application is necessary for any development work that seeks to confront climate change; and of great resonance for current CBNRM projects. Many existing development projects will simply become unsustainable under future climate change conditions; which introduce new conditions and new levels of uncertainty (See Ayers and Forsyth, 2009). Undertaking ‘business as usual’ development that does not take into account potential climate change impacts may prove maladaptive.

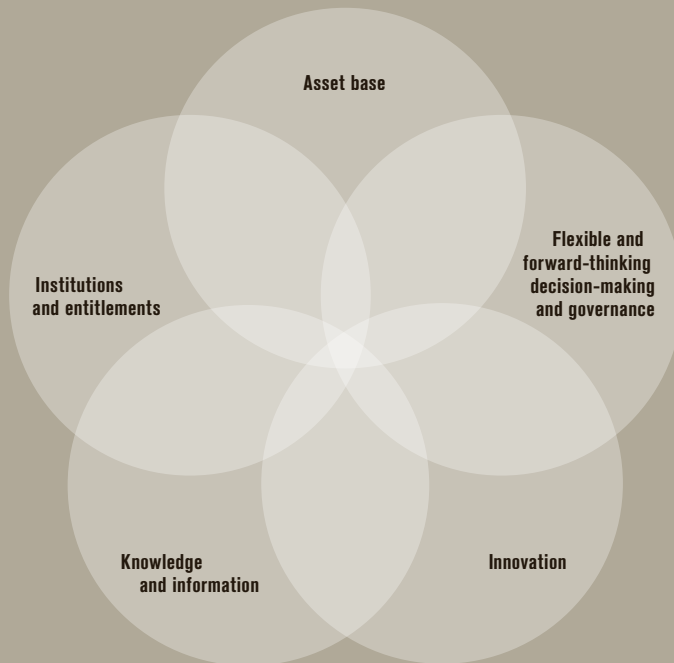
2.2.2. Adaptive capacity

The final core concept of climate change adaptation is that of capacity: ‘the ability of a system to adjust to climate change’ (IPCC, 2001). Adaptive capacity does not refer to short-term coping strategies (which are themselves an adaptation option) but encompasses continuous and permanent change in the system. To highlight this subtle difference, the IPCC (2001) defines the “coping range” as the ‘variation in climatic stimuli that a system can absorb without producing significant impacts’. As such, there is an implied limit to coping which may be well addressed within existing natural resource management. What makes adapting (the capacity to adjust) unique is that it is permanent and requires a change in the system rather than pushing the limits of the current system.

The Action Research for Community Adaptation in Bangladesh (ARCAB) project uses a participatory CBA approach in five livelihood zones including agricultural and forest-dependent communities. The research focuses on CCA strategies, knowledge sharing and diversification of livelihoods for climate-dependent activities. This project identifies both successful and failed coping strategies under existing climate conditions coupled with adaptation approaches under long-term climate change.

Too often adaptive capacity is generalised without clear indicators. It is dependent on a variety of social, economic, political, technological and institutional factors: varying in weight depending on the scale of analysis (Vincent, 2007). The relationship between these indicators at the national level changes when the focus turns to the community level. Acknowledging this uncertainty and complexity, for the purposes of this paper, a useful framework is the Local Adaptive Capacity Framework by the Africa Climate Change Resilience Alliance (ACCRA) which outlines the main determinants of adaptive capacity. This is made up the asset base of a community, institutions and entitlements, knowledge and information, innovation and governance (See ACCRA, 2010) – five indicators which will inform the later analysis.

Figure 1. - The relationships between the characteristics of adaptive capacity at the local level



Examples for each of the five Adaptive capacity indicators

Asset Base

The various financial, physical, natural, social, political and human capitals necessary to best prepare a system to respond to a changing climate. This category incorporates the importance of various capitals, often informal, non-monetary and reliant on various social networks.

Institutions and Entitlements

The ability of system to ensure equitable access and entitlement to key resources and assets is a fundamental characteristic of adaptive capacity. Given that entitlements to key resources needed to adapt can be differentiated along age, ethnicity, class, religion and gender (to name but a few), an institutional environment that allows equitable opportunities to all groups, particularly the marginal, and most vulnerable to the impacts of climate change is essential to building the capacity to adapt. Representation and participation in key institutions is also emphasised to enable equitable distribution of resources. Access to key resources, participation in the decision-making process, and empowerment are key elements of the characteristic.

Knowledge and information

Successful adaptation requires information and understanding of future change, knowledge around adaptation options, the ability to assess them, and the capacity to implement the most suitable interventions. In the context of climate change it is important to ensure that systems are in place to distribute relevant information at both national and region scales. In addition, forums for dialogue and discussion amongst all stakeholders must be made available.

Innovation

A key characteristic of adaptive capacity relates to the system's ability to support innovation and risk taking. Innovation can be planned, high-tech orientated, and geared towards large scale innovations; or it can be autonomous, local-level initiatives that help innovate or adapt to changes to the local climate. An enabling environment that promotes and allows for experimentation and the exploration of niche solutions is required to take advantage of new opportunities and to confront challenges presented by climate change. The environment also needs to protect against risks of failure associated with innovation.

Governance

Informed decision-making, transparency, and prioritisation each form key elements of adaptive capacity. Ensuring that local organisations are informed on future climate impacts and take appropriate measures to plan for the future. Similarly, flexibility to allow for systems, and the institutions that govern them, to evolve and adapt to a changing environment is a crucial characteristic of adaptive capacity.

Source: ACCRA, 2010

2.3 Community-based adaptation

Community-based adaptation evolved from the merger of climate change and development to put community first for CCA. It is a bottom-up approach whereby the community is the subject of projects including competence development and technology transfer; and also the main entity to implement adaptation (Sekine *et al.*, 2009). It uses participatory approaches to harvest existing local knowledge and coping strategies as well as identify new adaptive measures (Prowse and Scott, 2008). In this way, vulnerability and resilience assessments not only address scientific knowledge of the impacts of climate change but diverse factors such as poverty, social capital and indigenous knowledge (Sekine *et al.*, 2009). Furthermore, CBA advocates adaptive decision-making in light of climate uncertainty. As explained by Bharwani *et al.* (2005) this shift 'addresses the need to support strategic and operational decision-making on climate risk management and adaptation. [...] Key concepts are the need to reduce decision uncertainty, the value of climate information and understanding actual decision processes'.

CBA tackles the traditional top-down adaptation approach. Agrawal *et al.* (2009) cite that '85% of all priority projects as identified by the NAPAs pay little to no attention to local institutions'. CBA targets local communities and institutions, ideally with the aim of feeding into higher-levels – a goal realised with varying degrees of success within CBNRM. Many adaptation projects and interventions will fall short if they cannot address all the underlying determinants of vulnerability such as proprietorship and institutional assess. As we will see, CBNRM offers a blueprint for such change. Moreover, community-based adaptation puts poverty-reduction and empowerment at its core with the goal to enable communities to take action themselves based upon their own decision-making processes. As we will see, this is sustainable livelihoods and devolution. While CBA is a relatively new approach, it is based on certain established principles borrowed from other development fields (Huq and Reid 2007):

- Outside agencies must gain the trust of communities through immersion in the field and through using brokers and intermediaries (such as local NGOs or community groups)
- Possible future adaptation initiatives must be embedded in communities' existing knowledge of climate variability, and must be based on community members' participation
- That community-based adaptation is a form of action research, and can only be learnt through practice

The defining characteristic of CBA is that the researcher is not the teacher but the student. It is crucial that CBA is community-driven and voluntary, rather than treating the community as simply the recipient. There also must be trust amongst residents, outside networks and government to ensure the community accepts the knowledge and support offered. This is especially true for CCA where benefits may only be witnessed over a long term period. As explained by Sekine *et al.* (2009) for residents in developing countries, 'the introduction of technologies that do not bring about short-term benefits tends to be recognised as a risk. To avoid such a situation, trust in the local government and trust within the community, amongst others, are indispensable'.

Moreover, the community defines its own vulnerability and resilience after scientific information is provided. In this way, CBA combines scientific projections from climate change models, seasonal forecasts, remote-sensing, and satellite pictures alongside local, indigenous knowledge about trends and patterns experienced by communities (Reid *et al.*, 2010). This is especially relevant for areas where there is limited historical data about climate trends and where local knowledge can inform regional scientific studies. Gill (1991) compared local farmers' knowledge of rainfall patterns in Nepal and found they matched the scientific data recorded at nearby weather stations.

In a project by the Kenya Agricultural Research Institute and the Kenya Forestry Research Institute in the Nyeri and Laikipia Districts of the country, surveys revealed a hundred percent knowledge amongst farmers about climate change and its impacts. Rather the problem was that communities felt cut off from government and NGO support about what adaptive actions to take on (See Reid *et al.*, 2010). In this way, good CBA is about a process of change; a feature that can be enhanced by CBNRM lessons which we will see in the case studies to follow.

There are many studies and reports that demonstrate the accuracy of indigenous climate knowledge (McGrath, Warrick) (Reid *et al.*, 2009). Of course, co-learning is essential. Whilst communities can chart changes in their local environment, there may exist little knowledge of the global causes and effects of climate change. CBA often employs co-learning approaches, drawing on both local and external scientific knowledge about climate change, explained in the first language of the community and in a way they can assimilate (Reid *et al.*, 2009). The use of forecasting for agriculture or Disaster Risk Reduction, in particular, first requires trust in the forecasts based upon the accuracy and pay-offs of different strategies; taking many years to gradually shift practices (Bharwani *et al.*, 2005).

Community-based Adaptation in Africa (CBAA)

The CBAA project began in 2008 to carry out CBA pilot projects throughout eight African countries (Sudan, Tanzania, Uganda, Zambia, Malawi, Kenya, Zimbabwe and South Africa). It is led by the African Centre for Technology Studies (ACTS) in Kenya, and funded by the IDRC/DFID Climate Change Adaptation in Africa (CCAA) programme. The aim of the three year project is to:

- a) Test the efficacy of the Local Options for Communities to Adapt and Technologies to Enhance Capacity (LOCATE) methodology
- b) Develop a tried and tested methodology for setting baselines, monitoring and evaluating changes in climate adaptation capacity
- c) Reduce the vulnerability and enhance the capacity to adapt to climate change of particularly vulnerable communities in the eight chosen countries
- d) Develop the capacity of relevant stakeholders to mainstream climate change adaptation into plans and activities through knowledge exchanges and information provision
- e) Strengthen existing networks to enhance understanding of the climate adaptation needs of vulnerable communities
- f) Enlarge the body of knowledge and information on vulnerability and adaptation. The project demonstrates a practice where communities drive with research and poverty-reduction given equal footing to CCA. Capacity building and support is being given to NGOs and communities through training to facilitate integration of climate change into their plans and activities. The intermediary NGOs work with, and support the implementation of community level activities geared towards climate change adaptation.

A CBA project may start by identifying communities in poor countries that are most vulnerable to climate change, or by vulnerable communities themselves (Reid *et al.*, 2009). CBA may also follow from pre-existing work with communities coping with a disaster such as extreme weather events. Good CBA practices will highlight a variety of shocks and stresses within a community, not solely related to climate (Prowse and Scott, 2008); and utilise scientific and local knowledge in equal measure.

Examples of the main participatory tools used in CBA

Participatory Tools	Uses
Mental Models	Drivers and effects of climate change
Seasonal Calendars	Seasonality and links with livelihoods Can be combined with timelines to show perceived changes in seasonality
Timelines	Hazards and events Trends in climate (i.e. temp and rainfall)
Community Mapping & Modeling	Resources Types and causes of risks and threats Extent of vulnerable areas Vulnerable households and individuals Planning DRR/CC adaptation measures
Transect Walks	Vulnerability/risks Land-use Resources
Ranking	Vulnerabilities and hazards Coping and DRR strategies (i.e. water management options, crop varieties)
Dream Maps & Drawings	Vision of community or farm and how to achieve measures
Theatre, Poems, Songs	Awareness raising of risks and risk reduction measures Advocacy
Participatory Videos	Awareness raising Farmer to farmer communication Advocacy
Stakeholder Analysis	Institutions, relationships, power
Key Informant Discussions	In-depth discussion of vulnerability Livelihood sources

Source: Reid *et al.*, 2009

2.3.1 Ecosystem based adaptation

One area worth highlighting is that of ecosystem based adaptation for both CBA and CBNRM. Ecosystems transcend community and non-community spheres with significant community-ecosystem intersections. As touched upon in earlier sections, they provide goods and services that are essential for many livelihoods in the sub-region including the provision of food, fuel, water, fibre and pharmaceutical products; as well as services such as soil fertility, climate regulation and protection from extreme weather events. CBNRM has well developed rights-based approaches which have already informed ecosystem based adaptation in CBA projects. An ecosystem based approach will use biodiversity and ecosystem services as part of an overall adaptation strategy: focusing on those goods and services essential for livelihood. It can generate significant social, economic and cultural co-benefits; as well as contribute to the conservation of biodiversity and potentially assist mitigation through carbon sequestration and storage.

In addition, many ecosystems transcend community and national boundaries (e.g. river basin system and migration corridors). An ecosystem based approach can reveal negative impacts of one adaptation action versus another; and the consequences for other communities that share the ecosystem. For example, downstream water users, conflict between agricultural and pastoralist communities, or the fight for resources between rural and urban populations. CBA has already benefited from CBNRM approaches; however, it will become increasingly important for CBNRM to also recognise ecosystem based adaptation. Climate change will affect the boundaries and composition of many ecosystems as habitats and species adjust under a changing climate. As such, many community organisations, especially those with legal rights, will face new impacts and even conflict with neighbouring organisations. Ecosystem based adaptation is a vital platform for both CBA and CBNRM.

2.4 Motivation for linking CBNRM and CBA

CBNRM and CBA are both community-focused and community-driven. Both involve a process of empowering communities to identify and manage their resources; and in this way, their goals are complimentary involving many over-lapping approaches and issues. At the heart of both CBNRM and CBA is development and the community. Both stand on community efforts to improve their welfare and are enhanced by underlying physical and socio-economic conditions.

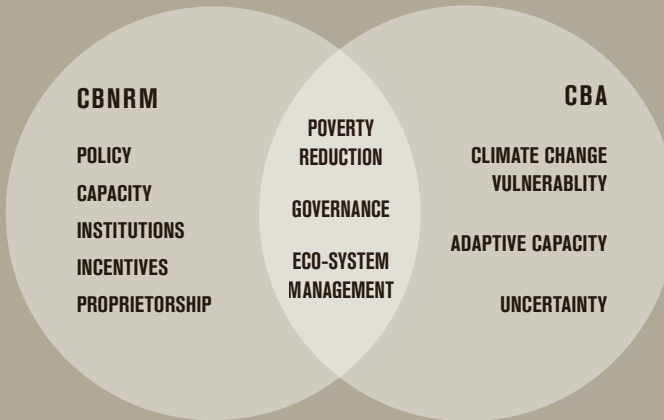
The motivation for this study comes from the emerging impacts and vulnerabilities of climate change that will threaten southern Africa. CBA is a fairly new approach to address community vulnerability by enhancing resilience and adaptive capacity head on; however, it is still growing and changing as new experiences are gained from practice. On the other hand, CBNRM, which operates in the same communities that need to adapt to climate change, has a longer, more established history which CBA can learn from. CBNRM has evolved organically over thirty years to become an established set of principles and approaches. Not only would CBA learn from CBNRM, it could also build upon the well-established base consisting of local institutional capacity, policy environment and technical capacity constructed over years of learning and action research. It would be naive of CBA not to learn from CBNRM projects: both their successes and failures. This is further relevant for current National Adaptation Programmes of Action (NAPA) projects which operate largely removed from the existing development and conservation communities and do not adequately include local institutions (Agrawal *et al.*, 2009).

There are many overlapping approaches used by CCA and CBNRM including those related to sustainable livelihoods, eco-system management and governance, which can increase the co-benefits for both. For example, incentives and devolution typified by CBNRM projects can help establish an effective institutional base for CBA initiatives. CBNRM also owes much of its success to external input, both financial investment and capacity-building. Although it is community-driven, significant funds have been put into CBNRM projects. Equally, training and expertise from civil society organisations have helped to prepare community stakeholders and share experiences throughout southern Africa. Such input was no small feat and would offer a valuable roadmap for CBA projects in the future. The later sections will explore all these concepts to demonstrate the motivation for linking CBNRM with CBA; organised around four principles: sustainable livelihoods, economic incentives, devolution, and communal proprietorship. In particular, an incentive-approach coupled with livelihood analysis is especially salient for CBA change work. As Sabates-Wheeler *et al.* (2008) explain, there can be a clash between the development and climate communities in the weight given to present-day risk over

climate change (future) risk. ‘There is a clear contradiction for chronically poor households who need to weigh up the outcomes of withholding ‘consumption’ today and death tomorrow with consumption today and life tomorrow.’ CBNRM confronts the twin goals of poverty-reduction and long-term natural resource conservation which can help identify early trade-offs between risks today versus risks tomorrow within emerging CBA activities.

Ultimately it may be the culture of the CBNRM community which will have the greatest impact on CBA. As discussed above, CBA is often accused of focusing on natural resource management with poverty-reduction given secondary importance. It is further accused at times of not being truly community-driven despite its name. CBNRM is a fusion of both natural resource management and development which can assist CBA to build projects which are guided by communities based upon their own decision-making processes. CBNRM case-studies can highlight early pitfalls for CBA and inspire new approaches not previously considered.

Figure 2. - The overlapping areas between CBNRM and CBA



As the diagram above points to, CBA can update existing CBNRM work by introducing the climate component: namely climate change vulnerability and adaptive capacity. Many CBNRM projects address weather patterns and climate variability, but the DRR participatory approaches incorporated into CBA (especially participatory methods of assessing vulnerability and resilience) can help CBNRM address long-term climatic changes. In fact, CBNRM has been criticised for inadequately addressing the mobility and unpredictability of resources such as species migration or water resources (Dumaru, 2010). CBA examines the local environment of a community but also incorporates what lies outside its boundaries. Most importantly, climate change will increase the

level of uncertainty for human and non-human systems; a crucial aspect of CBA programmes which is needed for CBNRM to use adaptive management as a process for addressing the uncertainties implicit in planning for multi-decadal climate change.

The analysis is anchored in case-studies to identify the major processes within CBNRM and CBA that can inform the other and highlight the co-benefits for both. Special attention is paid to the use of economic incentives in CBNRM work. The paper will then turn to the policy, legal and institutional factors necessary for building on the CBNRM and CBA linkages; as well as recommendations and ways forward to upscale these linkages and identify organisations and funding bodies relevant to this work.

End notes - CBNRM and CBA: theory and practice

2. The Parks and Wildlife Act abolished the use of permits although it retained a quota system for specific species
3. The world price of beef had declined from US\$ 4 to US\$2.50
4. Cited in Child (2003)
5. World Bank Report – Community Driven Development in Africa: A Vision for Poverty Reduction through Empowerment
6. Also the concept of “adapation deficit”. See Burton and May (2004)
7. In many projects we see a correlation between planned adaptation following from a structuralist reading of disasters; and autonomous adaptation prioritised from a behavioural definition

3. Analysis

This section identifies the conceptual synergies and areas of departure between CBA and CBNRM. As explained in the previous section, the two are complementary processes which are community-driven and community-focused. As such, CBNRM can bolster emerging CBA work; and vice versa, though there are areas of departure that must be carefully acknowledged. This section first identifies the process of adaptation, outlines the major processes born from CBNRM and CBA work; and finally identifies where linkages can be drawn.

3.1 Establishing the conceptual linkages

3.1.1 Conceptual linkages

Two ways of looking at adaptation is as an outcome or as a process. The former is often more tangible for practitioners and easier to identify. To illustrate, the UNFCCC outlines adaptation as the 'practical steps to protect countries and communities from the likely disruption and damage that will result from effects of climate change'. For example, floodwalls should be built and in numerous cases it is probably advisable to move human settlements out of flood plains and other low-lying areas. International organisations and governments generally favour an outcome-based reading of adaptation whereby indicators can be identified and, more importantly, measured. Such an approach seeks to define an explicit outcome, or end point, of the adaptation action (e.g. a flood wall or desalination facility). As explained by Harley *et al.* (2008), 'this might also be referred to as a "downstream" definition in the sense that the focus is on the residual effects of risks as experienced'. However, there are shortcomings by defining and measuring adaptation in such a way as it can become overly prescriptive, with inflexible approaches that focus on sub-optimal options. In situations where clear projections can be made such as rising sea levels then outcome-based approaches hold value, especially from Disaster Risk Reduction. However for many poor regions where uncertainty is the only guarantee, There is little point in expending resources preparing communities for climate change events that may not occur (or may occur after a non-climate change event has destroyed livelihoods anyway) (Sabates-Wheeler *et al.*, 2008). In this context, climate change adaptation must be one of facilitation, rather than concrete plans of what people will do if events occur with certain probabilities (Sabates-Wheeler *et al.*, 2008). Following from this, a process-based definition of adaptation can offer greater maneuverability, which changes with new scientific information; as well as allowing stakeholders to guide their own adaptation options. For example, adaptation as a process can be described as 'strategies to moderate, cope with and take advantage of the consequences of climatic events that are enhanced, developed, and implemented' (UNDP, 2005). Or as a 'process or outcome of a process that leads to a reduction in harm or risk of harm, or realisation benefits associated with climate variability and climate change' (UKCIP, 2003). The process-based approach is a hallmark of CBA, which seeks to define the key stages in a course of action that would lead to the best choice of end point, without specifying that point from the outset. This is an 'upstream' approach in the sense that it seeks to provide enhanced capacity to manage a range of outcomes (Harley *et al.* 2008). Indicators are used to inform and justify decisions, but no prescriptive outcomes identified. Although process-based indicators are more difficult to define, they allow stakeholders to choose the most appropriate adaptation action with the greatest degree of flexibility in a changing climate. They do not adhere to government targets and may not be sector-specific but CBA is fundamentally about process over outcome and will be treated as such in this paper.

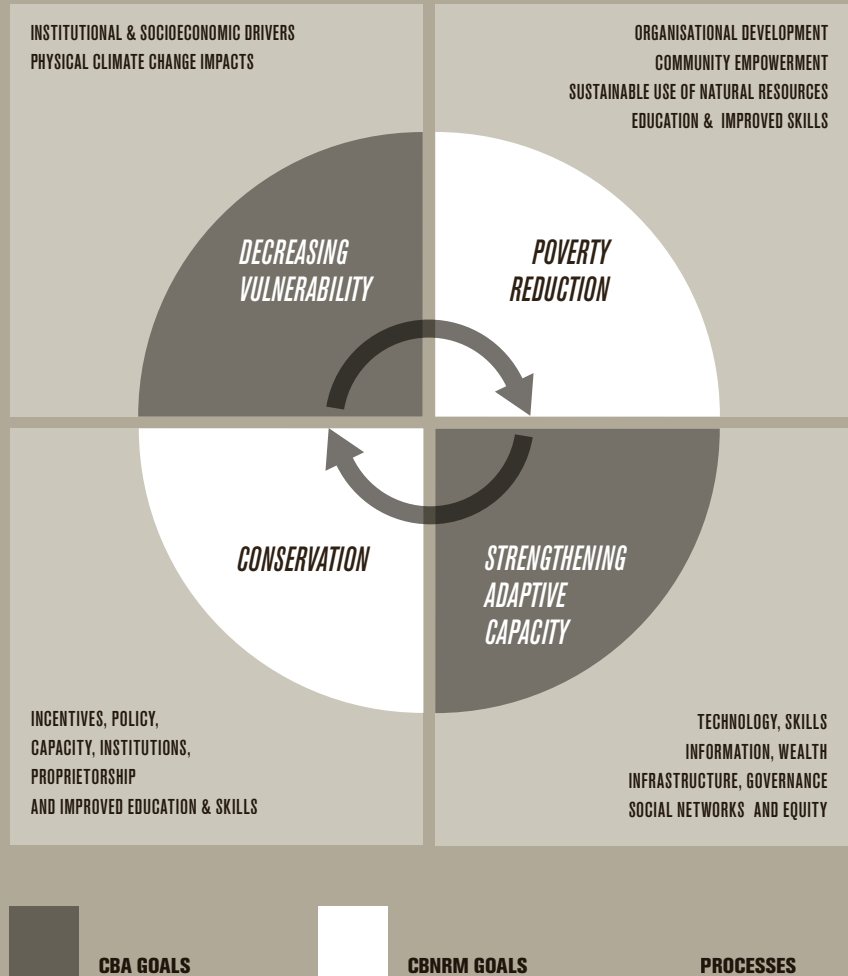
The evolution of community-based natural resource management demonstrates that it is also a process rather than just an outcome. It involves the gradual devolution of natural resource management through community decision-making processes. It is not an application that is to be used whenever or wherever, but a long-term route towards community empowerment and improved natural resource management (van der Jagt and Rozemeijer, 2002). Below is a diagram outlining the four central goals of CBA and CBNRM and the processes embedded within each. As explained in the previous section, CBA is designed to decrease vulnerability to climate change and strengthen adaptive capacity. CBNRM aims to reduce poverty and conserve natural resources. Many key areas and processes have evolved from these aspirations which are similar and complimentary; the important difference is that CBA processes are still underdeveloped especially those related to economic incentives and governance. For example, adaptive capacity includes livelihoods analysis where assets identify the vulnerabilities and capabilities of a household (and indeed a community). For the rural poor in southern Africa, key natural assets include agricultural lands, water and livestock as well as higher levels of education, skills and access to insurance/credit, just to name a few. This livelihoods approach addresses physical as well as institutional and economic barriers to poverty-reduction. Specific CBNRM processes such as sustainable livelihoods, incentive-based approaches, devolution, and communal proprietorship can inform CBA to both reduce vulnerability and increase adaptive capacity. In turn, CBA adds a crucial long-term climate component (including the institutional, socio-economic and physical climate change impacts), and identifies strategies to adapt.

As illustrated in figure 3. on page 50, there are several overlapping processes born from CBA and CBNRM such as improved policy and governance, enhanced social capital, education and technology. The following section tracks the four main processes of CBNRM and demonstrates how they can enhance CBA activities. These include: sustainable livelihoods, economic incentives, devolutionalism and communal proprietorship. In this light, case studies are introduced to demonstrate how the principles of CBNRM can help CBA projects assess and reduce vulnerability to climate change and strengthen adaptive capacity, as well as avoid maladaptation, facilitate innovation and technology transfer, and support investment in adaptation.

CBA, on the other hand, can also enhance CBNRM projects by introducing the climate element particularly through vulnerability and resilience frameworks, and the crucial question of uncertainty. Although CBA is still in its infancy, it makes use of robust methodologies on the physical, economic and social aspects of vulnerability. For example, the Climate Change and Environmental Degradation Risk and Adaptation Assessment (CEDRA) is a tool for understanding the science of climate change and environmental degradation and comparing this with local community experience of environmental change (See Oenone Chadburn in Reid *et al.*, 2010). It also reviews local resilience of programmes of work to identify areas of adjustment under future climatic conditions. In addition, CBA processes may highlight the difficult trade-offs that may occur in the future whereby new livelihood options are needed or migration is the only remaining option.

Although mitigation is not a focus of this study, there may also be opportunities whereby mitigation actions such as the Reducing Emissions from Deforestation and Forest Degradation (REDD) programme can increase adaptive capacity. There is potential for climate change mitigation to further incentivise this process as well as allow for long-term planning of tree species and forest boundaries.

Figure 3. - The overlapping processes of CBA and CBNRM



3.2 Practical linkages: case studies from southern Africa

This section outlines case studies on CBNRM projects and programmes from southern Africa that demonstrate CBNRM initiatives whose elements can contribute to enhanced adaptation actions aimed to address the impacts of climate change by communities. The case studies are drawn from selected countries in southern Africa to capture the variation in geography and lessons learnt from implementing CBNRM initiatives. They are selected to depict the four main areas that underpin CBNRM: sustainable livelihoods, incentive based approaches, devolution and communal proprietorship.

3.2.1 Sustainable livelihoods - The Kam'mwamba Community Integrated Natural resource management and Use Project in Malawi

Background

This initiative focuses on a community of five villages in the Mwanza East District of Malawi. They are involved in a CBNRM project that generates income from Non-Timber Forestry Products (NTFPs). The project began in 1996, originally as an off-shoot of the 'Sustainable Management of Indigenous Forest project', implemented by The Wildlife Society of Malawi (WSM), and funded by The German Agency for Technical Corporation (GTZ).

Implementation

The community had been experiencing heavy deforestation from both commercial exploitation and locals striving to earn a living to enhance their livelihoods. The area has about 3000 hectares of indigenous forest. The CBNRM project was therefore principally designed to respond to the problem of deforestation. The idea was to identify economic value in the indigenous forests, and devise mechanisms through which the community can benefit from such value. This would empower the community, enhance their livelihoods and at the same time create an incentive to conserve the forests. The economic value was identified to be in the harvesting and marketing of non-timber forest products.

The process leading to the identification of the project's activities and focus areas was participatory and involved members of the community who were mainly women. Although the community was clear on what it wanted to do, the project was preceded by extensive sensitisation activities in the form of meetings, drama, and theatre on the significance of focusing on the harvesting and marketing of NTFPs. Institutionally, the community organised itself into Village Natural Resource Management Committees (VNRC) with the responsibility of co-ordinating natural resources activities.

Each of these villages is currently involved in activities such as bee-keeping, tree nurseries, bamboo furniture making, production of briquettes (made from waste paper and crop refuse) as an alternative energy source, indigenous fruit-juice processing, and guinea-fowl rearing. These activities provide the community with food, cash income, and renewable domestic energy. For each of these activities, WSM project staff helped the communities with start up funds and technical advice, using village-based workers, who also came from the same communities.

Key Issue: Environmental Sustainability

The project is realising its intended CBNRM objective, namely; the conservation of indigenous forests and the enhancement of community livelihoods. However, what makes it particularly unique is its ability to integrate environmental sustainability in its activities. For instance, instead of producing charcoal (which results in deforestation) as an energy source, it opted for the production of briquettes. Instead of targeting tree logging, it opted to engage in bee keeping that has the additional advantages of conserving a vegetative environment, through controlling bush fires thereby allowing coppices, young plants and animals to survive. This approach has contributed to the area's ecosystem integrity and enabled the community to benefit from these ecosystem services in an environmentally sustainable way. To date the community has created communal woodlots, and they have a high sense of environmental awareness.

Lesson No. 1

Community responses that incorporate sustainable livelihood and environmental management strategies can build community resilience and adaptive capacity that lessens the vulnerability of the community to future climate change.

A livelihood is defined as comprising the capabilities, assets and activities required for a means of living. In order for it to be 'sustainable', it should be able to cope with and recover from external stresses and shocks, and maintain or enhance its capabilities and assets now and in the future (Chambers and Conway, 1992). The livelihood strategies adopted by the Kam'mwamba community within their CBNRM project fulfil the sustainable livelihood criteria.

Communities in southern Africa, such as the Kam'mwamba community, are presently exposed to external risks including those induced by climate variability and extreme weather patterns⁸. When community responses incorporate sustainable livelihood and environmental management strategies as occurred with the Kam'mwamba community, this can build community resilience to external stresses which can also include droughts and other climate variations and extremes. Although the Kam'mwamba CBNRM approach was motivated by deforestation activities than by climate variability concerns, this does not discount the significance of sustainable livelihoods strategies to respond to external shocks. It is hypothesised that these strategies can also build resilience and adaptive capacity that lessen the vulnerability of the community to future climate change (Elasha *et al.*, 2005). The lesson that can be gleaned from the

Kam'mwamba CBNRM case, therefore, is that certain sustainable livelihood and environmental strategies can be built in at community level and may be appropriate community-based climate change adaptation options.

Lesson No. 2

Local capacity is an important factor in enhancing community response to external shocks

The ability and capacity of the Kam'mwamba community to integrate sustainable livelihoods strategies into their CBNRM project is another valuable lesson for CBA. Local capacity is defined as the ability of a community to manage and derive benefit in a sustainable manner (SASUSG and IIED, 1997). This is, in turn, dependent on various factors such as community cohesion and, at times, support from private sector and NGOs that motivate participation in a project; community experience in, and history of, managing resources; and open and democratic local governance structures (SASUSG and IIED, 1997). The Kam'mwamba community's ability to incorporate sustainable livelihoods strategies in their project, can be explained in this context. The community participated in the formulation of the project with the technical assistance of an NGO. While it is not clear whether they had experience and a history of harvesting and marketing NTFPs, they seem to understand the importance of conservation. The community also had a democratic governance structure in the form of VNRCs that enabled members to participate in decision-making processes.

This experience emphasises the significance of local capacity in community-led projects. While in the case of Kam'mwamba, local capacity enabled the incorporation of sustainable strategies into the CBNRM project in response to deforestation, it can also be significant to enhance community capacity to adapt to external shocks resulting from climate change.

3.2.2 Incentive-based approaches - Masoka CAMPFIRE Programme - Zimbabwe

Background

The Masoka community was amongst the first communities in the country to establish a natural resource management regime for local development under the CAMPFIRE programme (Taylor and Murphree, 2007). Guruve Rural District, where the project is located, was accorded with "Appropriate Authority" status to oversee CBNRM-related developments in the community.

The area in which the community is located is endowed with arable land and wildlife. These two resources represent the main economic mainstay of the community (Taylor and Murphree, 2007). In addition, the community relies on fish for livelihood. The community also utilises its extensive woodlands and grasslands that provide building poles, fuel wood, edible fruits, tubers and thatching grass (Taylor and Murphree, 2007). When the initiative was introduced, its purpose was to resolve wildlife and

human conflicts, which were affecting the community's agricultural production. Wildlife was the community's most valuable resource, yet it was simultaneously its greatest threat to agricultural production. The CAMPFIRE programme was therefore seen as a solution to convert the wildlife threat into an opportunity by promoting the conservation of wildlife through the provision of economic benefits arising from wildlife hunting activities and at the same time enhancing the community's agricultural production.

Implementation

The decision to implement CAMPFIRE was made by the community itself without the influence of Government or any other actor (Taylor and Murphree, 2007).

Non-state actors such as non-governmental organisations were involved as advisors to the community on the community's terms and at its request (Taylor and Murphree, 2007). The community established institutional entities for the management and use of its natural resources, including the employment of necessary staff. The initiative's activities included erecting an electric fence around arable and residential areas for about 60 households to keep out wildlife (Taylor and Murphree, 2007).

This was seen as a strategy to protect and enhance agricultural production.

Other activities involved the introduction of sport hunting in the area through the establishment of a right to a hunting quota approved by the Parks and Wildlife Authority. The quota was leased to a commercial Safari Operator, the terms of which were negotiated between the Safari Operator and the Rural District Council based on market based mechanisms. The leases were usually 5-10 years in duration. Hunts were marketed internationally by the operator, with emphasis on greater efficiency of resource use. Revenue from the safari operation were shared between the community, rural district council and the safari operator (Taylor and Murphree, 2007).

Key Issue - Economic incentives

'Economic incentives' is perhaps one of the most critical elements underpinning CBNRM, as a concept. From an economic theory perspective, incentives are intended to motivate action in a certain direction. When applied to CBNRM, they are intended to stimulate greater community conservation, while at the same time contributing to poverty alleviation and rural development. Economic incentives come in the form of benefits arising from specific CBNRM activities that include cash revenue, services, and employment.

With respect to cash revenue, the Masoka initiative received varying amounts of revenue from its inception in 1990 to date. In 1990 it received US\$31,620, while in 2000 it received US\$118,778 (Taylor and Murphree, 2007), reaching a peak of US\$132,522 in 2006. The dramatic increase to US\$132,522 in 2006 was as a result of an agreement reached between the RDC, the Masoka community and the safari operator; where it was agreed that community revenue was to be remitted directly to the communities from the safari operators⁹. This clearly illustrates high levels of "wildlife taxation" that the RDC imposed on the Masoka community prior to 2006 (Taylor and Murphree, 2007).

In most cases the Masoka community would decide to use their cash revenue to pay for infrastructure and services that would benefit the whole community, as opposed to disbursing cash dividends to households. Such a decision is usually justified in situations where the composite community revenue is too low to make a meaningful livelihood impact by disbursing cash dividends to individual households. Some of the infrastructure and services bought and paid for by the revenue received include: the construction of roads and concrete causeways¹⁰; the construction of school class rooms; purchase of a tractor that assists in tillage and transporting community members etc. Other non-cash benefits that came from the initiative include the provision of meat (from the hunted wildlife) and employment¹¹.

Having said this, the Masoka community has also always appreciated the significance of household cash disbursements. They generally view individual household cash dividends as providing them with a direct and personal appreciation of the benefit of their collective efforts. They are also of the view that in times of crisis, such as droughts, cash dividends provide poverty relief. Taylor and Murphree (2007) also attest to this. In their study of the community, they observed that the use of household dividends is linked to local strategies to deal with acute poverty and points of extreme food crises. They note that in times of crisis the Masoka community has been willing to allocate wildlife revenues to food relief, using wildlife to reduce vulnerabilities to the vagaries of drought and growing conditions.

Lesson No.1 - In order for communities to be motivated to embrace CBA initiatives, incentives associated with CBA should be direct and visible

Sekine *et al.* (2009) noted that incentives are amongst the factors that are necessary for an effective CBA project. Incentives, in this context, are meant to motivate communities to accept implementation of adaptation actions that are long term in nature. Communities need to recognise that benefits will be realised and damage avoided by adapting to climate change. The assumption is that, this realisation will facilitate the smooth implementation of adaptation measures.

The Masoka case demonstrates that a community can be motivated to act in a particular way if it appreciates the value of a resource whose benefits accrue to it directly and visibly. For instance, the community benefited directly from direct cash dividends at household level; from visible communal projects such as roads, schools; and from employment opportunities that they witnessed. Motivation will be difficult to realise if the incentives are not direct and visible to a community. The aspect of direct and visible incentives illustrated by the Masoka initiative can be an important lesson for CBA practitioners. This is particularly so because in CBA, incentives to motivate communities to accept adaptation measures are usually long term. They tend to be realised in the future and are therefore not immediately discernible to communities. It is therefore critical that CBA incentive-based approaches combine short-term benefits (that are direct and visible) and long term benefits from adaptation.

Lesson No. 2 - Sustainable household cash income is an important factor in enhancing community capacity to respond to and cope with vulnerabilities caused by climate change-related factors

The Masoka case highlights the role of household cash dividends in responding to community vulnerabilities caused by external shocks such as poverty and drought. Although the community utilised cash dividends to respond to emerging crises such as drought-induced food shortages (and not long term climate change), thereby being more of a 'coping strategy' than an 'adaptation strategy'; it nonetheless provides invaluable lessons for CBA. It has been argued that cash transfers to communities can contribute to adaptive capacity (IIED, 2009). This argument is corroborated by the Masoka case. It demonstrates that cash dividends can assist in: reducing a community's short-term vulnerability, enabling households to respond to climate-related shocks, aiding households to manage risk, and facilitating livelihoods transitions.

Having said this, existing examples of CBA projects where cash transfers have been used to contribute to adaptive capacity show that they have predominantly relied on donor funds. While this has recorded some successes, such funds are unsustainable. The Masoka case suggests an alternative. The Masoka initiative highlights the significance of having a sustainable source of household cash income to respond to and cope with vulnerabilities caused by climate-related vulnerabilities factors. The sustainability of cash flow is guaranteed by community revenues received from a sustainable community-based project of wildlife conservation. Because it is sustainable, it also has medium to long-term significance.

3.2.3 Devolution - *Tchuma Tchato* in Mozambique

Background

Tchuma Tchato, which means "our wealth" in the local Chikunda language, is one of the first CBNRM programmes established in Mozambique. One of the locations in which this programme operates is Bawa, which is an area of about 200,000 ha close to the borders of Zambia and Zimbabwe (Salomão and Matose, 2007). It brings together six local communities with about 1,375 members who rely on the vast resources of the Mopani forests and the fertile soils of the area for subsistence (Salomão and Matose, 2007). The area is also remote and thinly populated, and conditions prevailing there are suitable for the sustainable management of wildlife, especially buffalo and antelope (Salomão and Matose, 2007). The programme was also implemented in Daque, which is an area of about 650,000ha and located south on the Zambezi Basin.

Implementation

The programme was established in 1994 through funds provided by the Ford Foundation and the International Development Research Centre (IDRC), and with assistance from the World Conservation Union (IUCN), the Provincial Services of Forests and Wildlife of Tete Province (Mugabe *et al.*, 2005). In Bawa, *Tchuma Tchato* evolved to become a

participatory natural resource management area. In Daque, it focused on the promotion of collaborative management of the water resources of Cahora Basa Dam, as well as of the forests and wildlife resources in the area including the sustainable fishing of kapenta (Mugabe *et al.*, 2005). A Provincial Unit for CBNRM was established in 1998 and is now being strengthened. Community committees for natural resource management were established by interested community members, using a gender-sensitive approach, and are turning into legally recognised community-based organisations to represent their interests on natural resource issues (Salomão and Matose, 2007).

Key issue - Governance and institutions

A unique element of the *Tchuma Tchato* initiative is the manner in which its institutions acquired authority and legal status to manage natural resources at local level. As a project, it facilitated central government response on many aspects, including the issue of sharing revenue from safari operations in the area¹². Unlike other devolution approaches in southern Africa that originate from central government, devolution in the case of *Tchuma Tchato* was site specific and originated from rural community, district and provincial levels. The local institutional framework for the project comprises a village council elected at village level, and a superior council. The superior council is responsible for overall management and has representatives from the village council and other stakeholders – state agencies and NGOs (Chishakwe *et al.*, 2009).

The establishment of these new institutions was done without necessarily evaluating the need and relevance of such institutions *vis a vis* the existing ones such as traditional institutions (Jones, 2002). In some cases conflicts emerged with the creation of the institutions, as traditional authorities felt that their positions and powers were being taken away (Matakala and Mushove, 2001). On the other hand, the new institutions faced difficulties in imposing their authority to communities that hitherto were used to free access to natural resources, with such communities naturally showing resistance to the new models of resources use and management (Matakala and Mushove, 2001). This is because the traditional local authorities questioned the legitimacy and accountability of such institutions. Foloma (2000), also noted that the ‘...major problem with *Tchuma Tchato* was that the role of local authorities was not clearly defined, although it is recognised that they should be involved and directly benefit from the revenue distribution process’.

Lesson No. 1 - The institutional architecture in CBA projects should not only consist of new project-established structures; but should also recognise and include existing traditional institutional structures for the projects to be effectively implemented

The purpose of devolution is to ensure that: there is service delivery based on community priorities, programmes target community needs, and communities obtain an opportunity to participate in decision-making. This is intended to empower the communities. However, if devolution is ‘institutionally exclusionary’, as demonstrated by the *Tchuma Tchato* case, where traditional institutions were excluded and replaced by new institutions; the intended objective of empowerment will be diminished.

This lesson is important for CBA, which depends on the existence of strong institutional channels to connect communities (*inter se*) and communities with local government structures, as a conduit for introducing information and technologies. Community project institutional structures therefore have to be 'inclusionary' while recognising the role played by existing traditional and customary institutions in the area. This will avoid conflicts that will hinder institutional efficiency, with consequences on realising project objectives.

Lesson No. 2 - It is important for CBA institutional arrangements to be inclusive and create space for all relevant stakeholders - such as elected representatives, community members, NGOs and the private sector - to participate

The *Tchuma Tchato* case demonstrated that the issue of institutional choice is important, particularly at the project conceptualisation stage. Appropriate decisions have to be made on whether to use the public domain of elected representatives operating within a community or whether to build on existing customary forms – or to have a mixture of the two. This is important for CBA. In order for communities to, for instance, adopt a particular technology, the project will require the support of the technology users (i.e. the community members who are usually influenced by traditional authority), on one hand, and the creation of space for external actors (i.e. NGOs, private sector etc) who are responsible for channelling the technology to the users, on the other.

Furthermore, CBA is highly dependent on community-led knowledge and systems in devising appropriate adaptation actions. Such knowledge is, in turn, dependent on the willingness of the community to exchange and share experiences of traditional knowledge and practices. It is therefore imperative for traditional institutional structures to be included in any CBA project institution in order to facilitate such knowledge sharing.

3.2.4 Communal Proprietorship - The Mayuni Conservancy - Namibia

Background

The Mayuni Conservancy in the Kongola constituency which borders the Caprivi Game Reserve was registered by the Ministry of Environment and Tourism (MET) in December 1999. This was in response to the Namibian national policies and laws that give local communities new authority over the use and protection of wildlife. Their approach borrows from, and improves upon, the CAMPFIRE programme experiences from Zimbabwe. In Namibia traditional land tenure systems conferred ownership to the chief or king (Jones, 1998). These systems persisted under white rule, but were undermined by post-independence government policies that the power and status of traditional leaders. A problem of "open access" developed, with local indigenous populations unable to control the settlement of outsiders on communal lands or the use of communal resources. Population growth at rates of 3% or more per year in communal areas also increased pressure on natural resources (Jones, 1998). The Mayuni conservancy is

one such community with large village population which resulted in more competition for natural resources such as construction poles, grazing pastures, thatching grass, veld foods and land (Anon, 2002). The Namibian Government's approach to CBNRM focuses on encouraging and recognising communally defined and owned "conservancies." Under laws enacted in 1996, communities that apply for and gain official approval receive rights over wildlife and tourism in the designated area. Importantly, all income from resource use goes directly to the conservancy.

Implementation

In response to the problems of declining wildlife population, poor infrastructure, declining pastures and competition for natural resources (open access) a decision to form a conservancy was taken in 1999. The conservancy has relied on external funds from organisations such as Rossing Foundation and the MET for most of its external support. To meet the registration requirements the community elected a committee to represent the group, agreed upon a legal constitution that provides for sustainable management of hunting and "non-consumptive" uses of wildlife (e.g., tourism), established a means of managing funds, approved an equitable method for distributing income and defined the geographic boundaries of the proposed conservancy. The conservancy has an institutional Board of Trustees with two tribal courts (*khuta*) representatives and an appointed executive Committee which carries out day-to-day management of the conservancy activities and supervises the staff (i.e. community rangers, anti-poaching unit, and community resource monitors). The key role of the Board of Trustees is to ensure that the policies and activities of the conservancy are implemented. The conservancy management committee and the tribal authority facilitated the formation of a development committee. This committee also has strong relationship with institutions like the water committee which is within the conservancy. Because the community is involved in these institutions, they enjoy rights of ownership over huntable game (oryx, springbok, kudu, warthog, buffalo and bushpig). The rights include the use of the wildlife resources for the community's own purposes.

Key issue - Community Control of Natural Resources

Secure community tenure rights and control over natural resources by the community are essential elements in CBNRM programmes. In Mayuni, the *khuta* is viewed as the highest traditional authority in the community and it expects the conservancy to manage natural resources on its behalf. It exerts control and 'ownership' of community wildlife resources through participating in the decision-making institution of the Conservancy (i.e. the Board of Trustees). For example, representatives on the Board of Trustees are expected to report to the *khuta* on all decisions taken (Jones, 2000). Although it appears as if the traditional leadership is delegating authority to the conservancy, the (Jones, 2000). Although it appears as if the traditional leadership is delegating authority to the conservancy, the Chief still plays a strong role in driving the activities of the conservancy. He also holds funds that accrue to the tribal authority from activities that fall under the conservancy. The Chief also retains authority over the APU. In essence, the community appreciates the fact that they have control and ownership of their wildlife resources.

Lesson No. 1 - Traditional leadership can play an important role in signifying and symbolising community ownership over CBA projects

The Manyuni Conservancy case is an example where community control over natural resources is exercised through traditional leadership. The traditional Chief plays a prominent role in the development of the conservancy and in various conservation initiatives in the area. This lesson is important for CBA activities. It has been argued that the existence of a strong leadership is important to influence decision-making in a community and also the dissemination of information and technologies in CBA initiatives (Sekine *et al.*, 2009). It has been further argued that even if the economic incentives for adaptation in different communities are the same, the resultant degree of adaptation activities of the residents of each community will vary depending on how deep and to what extent leadership can influence the residents of individual communities (Sekine *et al.*, 2009). By illustrating the role of traditional leadership structures in assuming community control over wildlife resources; the Manyuni case demonstrates the potential role of traditional leadership in engendering community ownership over local projects, including CBA projects. The existence of key persons with leadership roles together with their capabilities becomes the evaluation index on whether adaptation in the community in question can be implemented effectively or not.

Lesson No. 2 - Social capital elements such as 'relationships of trust' between the community and its traditional leadership and between the traditional leadership and CBA project implementers can be important factors in promoting communal ownership over CBA initiatives

The issue of 'relationships of trust' within a community is important in establishing a unified approach for adaptation actions (Sekine *et al.*, 2009). Pelling (2004) points out that because of the existence of trust, transaction costs among residents for disseminating knowledge about climate change and technologies for adaptation decrease. As a result, adaptation is disseminated smoothly among community members. The Manyuni case demonstrates the significance of traditional authority in promoting communal proprietorship over local initiatives, established through 'relationships of trust' between the community and its traditional leadership on one hand, and between the traditional leadership and the Conservancy Board of Trustees on the other. The community had to 'trust' the traditional leadership to represent its interest in assuming control over their wildlife resources, whereas the traditional leadership had to 'trust' the Conservancy Board of Trustees, to make decisions that are in the interest of its community (notwithstanding the existence of mechanisms to participate in the Board by delegation). Such relationships of trust are critical for CBA because benefits of adaptation take a fairly long time to be realised. The community should therefore be in a position to trust the providers of adaptation technologies for the project to be effectively implemented.

End notes - Analysis

8. The Third Assessment Report of the IPCC (2001) noted that climate variability and extremes can be used as a proxy for climate change since experiences with adaptation to climate variability and extremes can be drawn upon to develop appropriate strategies for adapting to anticipated climate change.
9. A settlement and agreement was reached with the RDC and the safari operator that by the 1st January 2006 the safari operator would begin to make direct payments to the community's bank account of 50% of his contract quota price (the other 50% going to council and CAMPFIRE Association)
10. Masoka community CBNRM funds were used to upgrade a road and build a stone and concrete causeway across the Urungu River in 1998. More recently concrete causeways have been constructed across 4 rivers (Taylor and Murphree, 2007)
11. About 80 people at Masoka are locally employed on an annual basis (Taylor and Murphree, 2007)
12. The project's authority and legal status was established by an Interministerial Diploma 92/95 which provided for revenue

4. Getting CBA to work

CBNRM started as small, isolated pilot projects, taken up by several communities and countries and now operating at local, national and regional levels. While CBA is mostly in pilot stages dependent on external donor funding, its wider uptake and upscaling could learn from the key factors that drive CBNRM, which include:

1. Incentives and costs
2. An enabling policy environment
3. Regional cross-learning and championship.

These key drivers of CBNRM are different from the four elements that underpin it (see Introduction, p.17). They represent aspects that have facilitated its evolution over the thirty years of its existence to the present day.

The following section looks at these enabling factors and gives examples of how communities can benefit through incentives - financial and other - and discusses the elements needed for a supportive policy and legal framework and how this may be applied to CBA.

4.1 Incentives and costs

The conservation of natural resources and adapting to climate change are two goals for society, at least in theory, as they address the negative consequences of environmental degradation and climate change. In an ideal world, one would expect society to autonomously manage their resources and adapt to climate change because of the long-term benefit. However, this is not realised for a number of reasons, including more immediate needs such as poverty reduction and health, undefined or insecure property rights, as well as lack of information especially on long term climate change trends. A clear linkage between an activity that costs communities now and the flow of benefits directly linked to the activity provides incentives for undertaking it. As discussed earlier, incentives are a key component of CBNRM, whether in cash or in kind.

There are various examples where incentive measures have been used in CBNRM initiatives in southern Africa, these include:

- a) Property rights that allocate rights to own, use or manage biodiversity
- b) Markets and charge systems measures that rationalise prices and improve markets for the goods and services which depend or impact on natural resources
- c) Fiscal instruments (i.e. budgetary measures) that apply taxes and subsidies to the goods and services which depend or impact on natural resources
- d) Livelihood support incentives that strengthen and diversify the livelihoods of people whose production and consumption activities impact on natural resources

This section focuses on incentive-based approaches, and how experiences from CBNRM in southern Africa can contribute to understanding the role of incentives for CBA. The overall objective is to assess how these incentive-based approaches can promote community resilience and adaptation to climate change impacts.

4.1.1 Theory behind incentives

From an economics and sociological theory perspective, an incentive is defined as any factor that motivates action or that establishes a reason for preferring one choice or option to another (O'Sullivan and Sheffrin, 2003). They exist in various forms including: remunerative incentives where action is motivated by material reward (financial or non-financial); moral incentives where action is motivated by moral satisfaction; coercive incentives where action is motivated by fear of punishment; and natural incentives

where action is motivated by subjective human interests (O'Sullivan and Sheffrin, 2003). The notion of 'incentive-based approaches' in rural development has received much attention in recent years. Within the CBNRM community, it was first introduced in the 1970s in the form of material rewards to motivate natural resources conservation and rural development. Within the resources conservation and rural development. Within the CBA community it is currently emerging as a vital mechanism to motivate the adoption of adaptation actions by communities (Füssel, 2007).

There are potentially close linkages between CBNRM and CBA with the use of incentives. From a conceptual perspective, as outlined earlier, CBNRM was initially seen primarily as a conservation approach. However it emerged that it also had rural development co-benefits. It is now viewed as an institutional or organisational development programme whereby natural resources are utilised to economically empower local people. This proved to be an incentive to organise communities around democratic and managerial principles. Typical CBNRM tools have been the establishment of community-based institutions with legal recognition and the conferment of resource use rights to communities. The significance of this configuration, and which distinguishes CBNRM from any other conservation and development approach, is the fact that such rights have an economic value. Communities and their institutions are granted exclusive and transferable resource use rights, which they can exploit themselves, lease out, or exploit through joint venture partnerships.

4.1.2 The nature of incentives for adaptation

It is often argued that the economic value of a resource is crucial to make investment in management of resources worthwhile (Rozwadowska, 2011). Economic value is dependent in part on markets and mechanisms that ensure that landholders realise the value of their resources. Markets primarily determine the economic value accorded to the resource. This, in turn, is determined by various factors such as supply and demand of the resource. Non-market mechanisms/factors, on the other hand, such as government policy on subsidies, taxation structures, restrictions on the use and marketing of the resource also determine the appropriation of economic value of a resource (Rozwadowska, 2011). This indeed was the philosophical thrust that guided the origins of CBNRM, as mentioned earlier.

CBNRM experiences in southern Africa show that monetary revenues arising from CBNRM-related activities do not constitute a significant contribution to household livelihoods. The direct cash dividends to households are small and only benefit a small portion of CBNRM communities, with many community-based organisations (CBOs) not disbursing household dividends. In many cases, revenues are too modest to become the major livelihood source (Jones and Mosimane, 2007). Reasons for this state of affairs are usually high costs associated with the operation of community organisations and preference for community projects (Jones and Mosimane, 2007). A larger share

of revenues goes to operational expenditures of the CBO or communal infrastructure, or is saved for future use. In Zimbabwe for instance, district councils receive a portion for their administrative costs (at most 15% of revenues) and for resource management (35% of revenues) (Taylor and Murphree, 2007). Frost and Bond (2006) estimated that the median CAMPFIRE earnings per household range from US\$2.1 to US\$20.11 between 1989 and 2001. In other countries, all revenues accrue to the CBO, which can decide on its distribution. It is mainly in areas with abundant high-value wildlife where CBNRM has demonstrated sufficient income-generating potential to replace other land use options such as agriculture (Jones, 2006). Such areas are usually close to Protected Areas for example in Botswana, Zimbabwe, and Namibia (Jones, 2006).

Having said this, literature shows consensus that non-cash benefits of CBNRM have proved to be an important driver for conservation and rural development in Zimbabwe, Namibia and Botswana (see Ashley and LaFranchi, 1997). For example, a survey among conservancies in Namibia (Bandyopadhyay *et al.*, 2004), showed that established conservancies achieved higher welfare levels than those in their infancy. Jones (2004) argues that conservancies in Namibia have achieved higher welfare, but not necessarily high cash incomes for households, due to the importance of in-kind benefits such as game meat. In Botswana it was noted that in the south west of the country, CBNRM communities are aware that their hunting rights have shrunk under the community quota system, but they still prefer the new situation, as it empowers them and gives them choices for development and livelihood improvement (Arntzen *et al.*, 2007). In other words, the costs of CBNRM are outweighed by non-cash benefits.

This reveals that; notwithstanding the monetary (financial) value of an incentive measure, it is the perception of “value” accorded to the measure by communities that is usually the determinant of incentivisation¹³. In other words the incentives that motivate communities to act in a particular manner (in this case, to conserve and promote rural development) are not necessarily financial or quantifiable. It is usually when the ‘value’ of an incentive measure is associated with a particular community need that people weigh the benefits of conserving the resource against the costs incurred.

For CBA projects, incentives are critical to motivate communities to implement adaptation actions. However, because the benefits of adaptation are only realised in the long term; the specific nature of incentive measures required to motivate communities in the short-term becomes particularly important. The CBNRM experiences on incentive-based approaches outlined above demonstrate that communities do not necessarily act on the basis of monetary incentives alone. Rather, they are motivated by what they perceive to be of ‘value’ to them. This confirms an argument that has been advanced in relation to incentives for CBA that: ‘local people often measure the inputs and outcomes of an adaptation programme in ways that reflect the local systems of valuing goods, services and well-being’ (IIED and CLACC, 2010). When determining the appropriate nature of incentives for a CBA project at conceptualisation stage, it is therefore imperative to make such assessments from a broad viewpoint taking into account local value systems.

4.1.3 Reducing costs of adaptation

When an incentive measure is introduced in a community-led initiative, it is intended to motivate action in a particular way. This means that the community will be foregoing something in place of another. The aspect of foregoing something in place of an alternative is known as a 'trade-off'. Economists usually refer to it as an 'opportunity cost'. This is the 'sacrifice' or 'cost' that must be paid by the community to obtain a certain thing rather than other things that can be obtained using the same required resources. These are the costs that must be reduced and outweighed by incentive measures within a project/programme context, in order for the project/programme to be successful.

CBNRM experiences provide some insights on the application of trade-offs in community-led initiatives. Since CBNRM involves sustainable management of natural resources, this comes with costs that must be accounted for and addressed. One of the major costs for many CBNRM projects is the short-term loss of the use of a resource occasioned by 'use restrictions' (*et al.*, 2004). Within the wildlife sector of southern Africa, for example, such restrictions are intended to restrict poaching and enhance conservation of wildlife. If the objectives of the restriction are met, the long term benefits will exceed the short-term costs (WRI, 2009).

Of course, short-term costs can temporarily impact the community negatively and are often a source of community dissatisfaction (Kerr, 2002). It therefore follows that without a mechanism to compensate the community for their short-term losses, it will be difficult to achieve the intended project objective. In the case of Luangwa Integrated Rural Development Project (LIRDP) in Zambia, the project aimed to enhance wildlife conservation and promote rural development by ensuring that the community benefits from hunting concessions in the area. This also meant that the community had to conserve the wildlife thereby restricting their use of the resource, which hitherto had been an important source of livelihoods. Unfortunately the project did not factor in mechanisms to compensate for the short-term loss of livelihoods. Compounded by an extended delay in benefits accruing to the community as envisaged by the project; this led to extensive poaching which consequently resulted in the depletion of wildlife population in the area.

This demonstrates that in order to successfully implement a community-led project whose benefits are only realised in the long term, it is important to have interim (incentive) mechanisms that compensate for any short term costs. Some of the mechanisms used in CBNRM include offering wage labour to the community to off-set income loss. This was the approach adopted by the Sankuyo Tshwaragano Management Trust project, located in a wildlife management area of Botswana. The CBNRM project encouraged the community to move from cattle management to wildlife-based incomes (Arntzen *et al.*, 2007). However, in order to address the short-term costs associated with loss of income from cattle ranching, the project facilitated waged employment for 102 people out of a total community population of 372 (Arntzen *et al.*, 2007).

Most of the employment was through joint venture initiatives with private sector wildlife tourism and hunting companies. To date the project has seen decreased poaching and an increase in wildlife population in the area. Other mechanisms of compensating short-term costs include the provision of training to community members in order to open employment options; and establishing micro-credit schemes for community households (Kerr, 2002).

These experiences can enhance CBA work. As noted earlier, CBA projects offer benefits that will be realised in the long term. By introducing specific adaptation actions/interventions necessary to enhance community capacity to adapt to the impacts as associated with climate change and reducing their vulnerability, communities will inevitably incur certain opportunity costs. If not addressed, these costs will affect the implementation of projects. By demonstrating the need to identify suited and appropriate short-term benefits and proffering suggestions of compensation mechanisms, these CBNRM experiences offer important lessons.

4.1.4 Beyond financial incentives: social capital

From an economic theory perspective, the default position is that incentives are one of the main determinants of motivation that influences action in a particular direction. However CBNRM experiences in southern Africa provide some insight into the role of social capital in the application of incentives and trade-offs in community-led projects.

In the Masoka case described earlier, the community had initially expected a different incentive measure to what eventually transpired. At the project conceptualisation stage, the community expressed that they required infrastructure and services as expected benefits from CBNRM (Taylor and Murphree, 2007). Although these benefits are incentives in their own right, they could have been realised by other development initiatives that were not necessarily CBNRM¹⁴. It was therefore imperative for the project facilitators to identify an incentive measure that would motivate the communities to choose CBNRM, rather than other interventions. The idea of economic benefits accruing from wildlife conservation activities was introduced to the community through their traditional leadership. The nature of the incentive and how it would work was received with much reluctance by community members (Taylor and Murphree, 2007). However through the influence of the traditional leadership, the community eventually embraced the project.

The Masoka case demonstrates that it is not usually the 'rational understanding' of an incentive that motivates a community to choose one option instead of the other. There are many factors at play within a community that may influence community decisions in a certain direction. These factors do not necessarily address the 'opportunity cost' issues associated with the preferred alternative, but are based on other 'non-cost' factors such as social capital. The Masoka case highlights the pivotal role of traditional

authority and leadership structures in moulding community opinion and perception on issues that affect them individually. The decision to choose CBNRM in place of other projects was not only based on the community's own assessment of what the expected benefits (incentives) to come from CBNRM were, but was based more on the "respect" and "trust" they had for traditional authority.

This is an important lesson for CBA. It underscores the importance of understanding the role of social capital, especially the internal social capital of trust between community members and their traditional leadership in deciding on courses of action to take, including how to use their limited resources when confronted by a myriad of short- and long-term options. This further bolsters the statement by Pelling (2004) that, '...because of the existence of trust, transaction costs among residents for disseminating knowledge about climate change and technologies for adaptation decrease'.

4.1.5. Existing investments

The investment made implementing CBNRM across the region at all levels represents a ready-made infrastructure on which CBA could build upon; in southern Africa and elsewhere. This investment consists of the policies, institutions, M&E systems, community capacity and cross-learning and peer review mechanisms that have been developed as "learning by doing". CBA built on a CBNRM infrastructure will not incur huge costs of community organisation, management capacity building etc. In addition, most practitioners know the learning curve that they will apply to CBA at reduced costs. Examples of some of these investments include:

- Expertise - through the establishment and use of wildlife colleges, tourism enterprise and marketing ventures etc
- Institutions and networks - such as the Regional CBNRM forum, CAMPFIRE Association etc
- Legal and policy frameworks
- International and regional markets for wildlife, and NTFPs etc

4.2 Enabling environment for CBNRM-CBA linkages

This section outlines the policy, legal and institutional frameworks that have evolved to facilitate the successful implementation of CBNRM programmes in southern Africa. This is followed by suggestions on appropriate approaches to policy, legal and institutional frameworks necessary for successful CBA implementation, drawing lessons from the outlined CBNRM experiences. This will be done from a national and regional perspective.

Thindwa (2001) defined an enabling environment as ‘...a set of interrelated conditions – such as legal, organisational, fiscal, informational, political, and cultural – that impact on the capacity of development actors such as CSOs to engage in development processes in a sustained and effective manner’. Although this broad explanation of the phrase was applied in a specific context in relation to civil society organisations (CSO) operations, it nonetheless reveals its salient elements. For purposes of this section, emphasis will be placed on the legal, organisational, political and cultural conditions.

4.2.1 National environment

At the national level, there are several conditions that are required to facilitate the successful implementation of CBNRM. These include an enabling policy and legal framework, and efficient and effective institutions. This part of the section exclusively outlines important components required for a successful CBNRM policy and legal framework. The second part of the section identifies lessons drawn from these approaches with the intention of proffering suggestions for establishing an enabling CBA policy and legal framework at the national level.

4.2.1.1 CBNRM

National policies, laws and institutional arrangements should not apply in a manner that hinders the achievement of CBNRM objectives reflected by the four conceptual pillars of CBNRM, outlined earlier; namely: sustainable use as a conservation paradigm, economic incentives, devolution of control over natural resources to local level structures, and communal proprietorship over natural resources.

Sustainable use

An enabling policy, legislative and institutional framework that advances sustainable use is one that promotes the use of natural resources in a way and at a rate that does not

lead to the long-term decline of the resources, thereby maintaining their potential to meet the needs and aspirations of present and future generation¹⁵. Where countries do not have specific CBNRM policy and legislative frameworks that reflect this notion, it is usually addressed in environment-related policies and legislation such as wildlife, fisheries forestry etc. The common thrust of these instruments should be to curb unsustainable practices through various mechanisms such as the use of 'bans' to protect endangered species, or the use of restrictive measures to regulate resources use through a permit system, or the provision of incentives to motivate conservation. For instance, in Zimbabwe, the Communal Land Forest Produce Act restricts the use of forest products to "own use" and excludes use of products from protected forest areas and areas where a license to cut trees has been granted to others. The use of certain trees is also restricted. In Botswana, the same is true. The Agricultural Resource Conservation Act gives authority to Agricultural Resources Board (ARB) to restrict the use of various natural resources through the use of a permit system. Most environment-related national policy and laws in southern Africa have adopted this approach.

Economic incentives

An enabling policy, legislative and institutional framework that promotes the use of economic incentives motivates communities to conserve natural resources through receiving direct economic benefits arising from the sustainable use of those natural resources. For the policies and laws to be effective they have to: establish a right for communities to benefit directly; establish processes through which the benefits are channelled to communities; and facilitate the generation of the economic benefits by communities and third parties¹⁶.

The right to benefit derives from either the right to own or the right to use a resource. Most national policy and legislative frameworks in the region have recognised this right for local communities. A good example is Namibia. The Policy on Wildlife Management, Utilisation and Tourism in Communal Areas of 1995 recognises rural communities' right to use and benefit from wildlife, and their right to benefit from tourism concessions. While the policy only recognises these rights, they are only conferred on communities once they form a collective management institution known as a 'conservancy. The conservancy is expected to be legally registered, to have clearly defined boundaries, a defined membership, a committee representative of the membership and a plan for the equitable distribution of benefits to members (Jones, 2007). The policy is given force of law by the Nature Conservation Amendment Act of 1996. This law empowers the Minister to declare communal areas as conservancies; for purposes of the Act, if the Minister is satisfied that the communities meet the conditions provided. As soon as they are legally recognised as conservancies, the communities are bestowed with enforceable rights to use certain species of wildlife for their own consumption without a permit and can gain trophy hunting quotas from government. The rights also extend to obtaining permits to allow sport hunting on their land and to sell live game.

Processes through which benefits are channelled to communities are usually reflected by established institutional arrangements that enable communities to directly receive revenue from CBNRM activities. The level of recognition in national policy and legal frameworks vary between countries in the region. The extent to which they vary usually mirrors the extent to which devolution (explained above) varies. An example of an enabling policy and legislative framework that establishes processes to ensure direct revenue receipt by communities is the Forestry and Wildlife Law of Mozambique described earlier. The law established councils whose task is to, amongst other things, ensure the participation of local communities in deriving benefits arising from forest exploitation. The law further allows communities to receive the full amount of the income derived from joint venture between them and private sector players. If the communities legally constitute themselves into not-for-profit legal associations, Sociedade Anonima, they can also directly benefit from forest conservation benefits without paying tax for 10 years under a government decree ¹⁷.

For a policy or law to be able to facilitate the generation of benefits, it should recognise the role of the community not only as users of natural resources but also as entrepreneurs; and the role of third parties such as private sector actors. The policy and legislative framework of Botswana is illustrative. A government decree on “Community tourism and hunting development activities” empowers communities to be entrepreneurs in the wildlife and tourism sectors. It allows a community situated in, or adjacent to, a controlled hunting area zoned for community management to apply for a wildlife quota subject to meeting certain conditions ¹⁸. Once these conditions are met, the community may obtain a 15-year wildlife and tourism resource lease from the Land Board and the Department of Lands. The community may also enter into a sub-lease and/or joint venture agreements with private hunting and tourism operators (Jones, 2007).

Devolution

An enabling policy, legislative and institutional framework that promotes devolution, within the context of CBNRM, facilitates the transfer of rights and powers over the management of local natural resources from central government to local authorities. For it to be effective, the relevant policy or law should specifically cede power from central government to the lowest hierarchical authority. The nature of the devolved powers is also critical. Local authorities should have the power to determine how to sustainably use resources located in their areas; as well as the ability to determine how such resources will be of benefit to them. The extent to which actual devolution exists, as reflected in national policy and legal frameworks, differs from country to country and between sectors, in the region. Some laws appear to devolve powers yet still retain real powers in the central government (pseudo devolution), while some laws attempt to devolve but only to local level government structure (partial devolution). Others still devolve power to the lowest level (complete devolution).

Pseudo Devolution

The Fisheries Conservation and Management Act of 1997 of Malawi, is an example of 'pseudo devolution' where it retains all powers and responsibilities associated with protecting and using fisheries resources with the Director of Fisheries (Trick, 2000). Reference to community involvement in fisheries management is mainly found in a provision that authorises the director to enter into fisheries management agreements with fisheries management authorities. The Act also enables the Director to establish local fisheries committees to which the director may 'delegate some powers'. Far from giving the fisheries committees actual 'residual power', the law gives the Director wide discretionary powers to determine when and what type of powers should be exercised by the committees¹⁹.

Partial Devolution

The wildlife policy and legislative framework of Zimbabwe devolves rights and powers over wildlife management to Rural District Councils (RDCs), which are government bodies (Jones, 2007). The law does not devolve power to levels below the district councils (i.e. to communities). Although attempts have been made to devolve further, such instances have been to devolve power to ward wildlife committees, which are administrative units also under the control of the RDCs.

Complete Devolution

An example of 'complete devolution' is found in the Forestry and Wildlife Policy of Mozambique, formulated in 1999. The law that gives effect to this policy is the Forestry and Wildlife Law of 1999. It empowers the government to delegate powers of management of natural resources to local communities and the private sector. The law also makes provision for the private sector and communities to exploit forestry resources by obtaining a licence or a concession in forests. More importantly, it makes provision for the creation of local resource management councils (made up of community representatives, the private sector, associations and local state authorities). These councils are responsible for protecting and conserving resources and promoting the sustainable use of forest and wildlife resources. A specific duty of the councils is to ensure the participation of local communities in the exploitation of these resources and in deriving the benefits of exploitation.

Collective proprietorship

An enabling policy, legislative and institutional framework that guarantees collective proprietorship allowing communities to collectively own and manage natural resources in their area. This, in turn, is usually dependent on the existence of secure tenure rights over the land upon which those resources are found. Most countries in the region recognise communal tenure which is often expressed in different forms. However, the extent to which those rights are secured varies. For example, Botswana has a tribal land system that allows communities to occupy land as a collective, but the land is held in trust by the State. In Malawi, land belonging to traditional authorities can be registered

and defined according to communities, families or individuals. Once registered the land holdings become private customary estates with land tenure rights that preserves the advantages of customary ownership but also ensures security of tenure (Jones, 2007). Mozambique recognises community customary rights over land through a certification system based on delimitation of the community area (Salomão and Matose, 2007). Zimbabwe assigns control over communal land to the State with administration carried out by the RDCs, rather than traditional leaders (Taylor and Murphree, 2007). Agricultural land is held under customary law and each farmer has usufruct rights but no ownership rights while rangeland, woodland and wildlife resources are considered a collective commonage (Murphree and Mazambani, 2002). Lastly, Namibia recognises customary land rights that are allocated by a traditional authority to individuals. Residents may have access to common grazing lands subject to conditions made by the traditional authority; though the relevant laws do not specifically provide for collective rights for communities over land and resources found on the land. They do, however, recognise the collective use of land by conservancies, as explained earlier.

4.2.1.2 CBNRM-CBA policy linkages

An enabling environment for CBA is expected to facilitate enhanced resilience of communities and ecosystems to projected effects of climate change. However, since climate change affects communities differently according to their respective vulnerabilities and adaptive capacities, CBA programmes will inevitably be intrinsically 'local' and 'context-specific'. An appropriate and effective enabling environment for CBA should therefore include a policy, legal and institutional architecture that is broad and flexible enough to address these issues. This would inevitably be built around common CBA pillars and objectives, namely:

- a) Responding to community vulnerability
- b) Strengthening adaptive capacity

The objectives of CBA are not all similar to the pillars of CBNRM, around which the above discussion on its policy and legislative framework is based. However some lessons from the CBNRM policy experience can be highlighted to enhance CBA policy and legislative frameworks and forge synergies between the two.

Community vulnerability

An enabling policy, legal and institutional framework that responds to community vulnerability, within the context of CBA, should be able to facilitate the enhancement of a community's resilience, i.e. to enable a community to identify climate-related threats on one hand, and the resilience to exploit opportunities and recovery from the impacts of climate change, on the other. This would entail the opening up of opportunities, availing of options, and removal of hindrances, for communities (especially women and other marginalised groups) to adapt to the impacts of climate change. Because community vulnerability can emerge from diverse sectors, for instance; agriculture, coastal zones etc; the nature and focus of resilience is sector-specific.

There are various policy and legal measures that can be used to facilitate the enhancement of community resilience. Based on experiences from CBNRM; one of the effective measures is promoting 'community empowerment', through devolution. This measure can be sector-specific as well, to respond to the sector-sensitivity of vulnerability. For instance, CBNRM-related national policies and laws in southern Africa such as forest, fisheries, and parks and wildlife, guarantee community participation in decision-making processes in different ways that are specific to their respective sectors. What is key, from a policy and legal perspective, is ensuring: that there is 'complete' devolution where community resilience needs are expressed and prioritised; and that the nature of the devolved powers is such that it can assist communities to respond to their vulnerability, including making decisions on resource allocation.

Because community climate change vulnerability is inextricably linked to poverty; it is also important for policy and legal frameworks to facilitate alternative livelihoods options for communities. Without necessarily prescribing particular options; policy and legal measures can create an enabling environment for the promotion of diversified rural livelihood options. From CBNRM experiences, it is possible to achieve this. Policies and laws can be used to establish community rights. In case of CBNRM, the law was used to establish a right for communities to directly benefit from the sustainable use of natural resources. In the same manner, the law can also be used to establish a right for community social and economic well being. Such rights are already recognised in international human rights law through instruments such as the International Covenant on Economic, Social and Cultural Rights. However, cognisant of the practical challenges of realising the objectives of this approach (which are anchored on the financial and economic capacities of governments), such an approach can be 'watered down' and interpreted as only obligating the government to facilitate diverse economic opportunities for communities. CBA can also learn from CBNRM experiences on economic incentives in this regard, where certain policies and laws are being used to facilitate the generation of the economic activities in rural areas, and consequently creating alternative livelihood options²⁰. The same policies and laws also encourage community entrepreneurship and partnership with the private sector.

Strengthening adaptive capacity

An enabling policy and legal framework that strengthens community adaptive capacity should be able to facilitate the ability of communities to adjust to potential damage, to take advantage of opportunities, or to cope with the consequences of climate change. This would entail promoting innovation, institutions and entitlement, information and knowledge sharing, asset base development, and governance.

With regards to innovation, there should be an enabling environment to support communities' ability to innovate and take risks (and protection from risk of failure), including experimenting and exploring solutions in order to take advantage of new opportunities and to confront challenges presented by climate change. On institutions and entitlement, the environment should ensure equitable access and entitlement

to key resources, while embracing the need to ensure equitable opportunities to all groups (particularly the marginal and most vulnerable) to the impacts of climate change. Regarding information and knowledge, the environment should permit communities to assess adaptation options and implement the most suitable interventions, which in turn depends on the existence of systems to distribute relevant information at various levels. In relation to asset base, the environment should facilitate the availability of various financial, physical, natural, social, political and human capitals necessary to best prepare a community to respond to a changing climate. With respect to governance, the environment should facilitate informed decision-making, transparency, and prioritisation at the same time ensuring that local organisations are informed on future climate impacts and take appropriate measures to plan for the future.

CBNRM policy and legislative experiences provide lessons on some of these issues. For instance, in the context of devolution and proprietorship – several national CBNRM - related policies and laws promote access and entitlement to key community resources by community members. They establish local level institutions wherefrom community members can determine rules of accessing natural resources including issues related to allocation of 'communally-owned' benefits amongst themselves. Furthermore, the element of proprietorship realised through policies and laws that engender a sense of control, entitlement, and ownership of community processes and assets; enables community members to feel involved in the initiative. This lesson is significant for enhancing adaptive capacity because it provides a basis upon which community institutions can determine rules and mechanisms that result in equitable opportunities for all community members, including marginalised groups most vulnerable to the impacts of climate change. This experience is also related to the aspect of governance in enhancing adaptive capacity, where these institutions can facilitate decision-making, transparency, and collective prioritisation of appropriate adaptation interventions.

CBNRM policy and legislative experiences on devolution also provide lessons for creating an enabling environment for information and knowledge to advance adaptive capacity. Local level institutions (established through devolution) can be an arena where information and understanding of future change, knowledge around adaptation options can be exchanged. Institutionally, they can serve as a conduit for distributing relevant information between community level and the national level. This facilitates a bottom-up approach, most suited to CBA – where decisions on appropriate adaptation actions should emanate from the communities themselves; and not the other way round.

4.3 Regional environment

In southern Africa, the main regional body that is responsible for regionalisation is the Southern African Development Community (SADC). This is an inter-governmental economic and political body whose objective is to 'achieve development and economic growth, alleviate poverty, enhance the standard and quality of life of the people of southern Africa and support the socially disadvantaged through regional integration'. Its institutional framework consists of the Summit of Heads of State and Government; the Tribunal; Council of Ministers; Organ on Politics Defence and Security Cooperation; Sectoral Ministerial Committees; the Secretariat; Standing Committee of Senior Officials; and National Committees and Sub-committees.

Regionalisation as a concept is intended to forge greater integration (in various sectors) between countries that share a common vision. In order to achieve this, the concept envisages reduced or no conflicts between individual national approaches on specific areas of cooperation. It expects greater harmony and collaboration. The significance of a 'regional enabling environment' therefore is to foster harmonisation of national policy, legislative and institutional processes; in pursuit of 'regionalisation'.

4.3.1 Regional harmonisation of CBNRM

The process of harmonising national policy, legal and institutional frameworks in SADC Member States is guided by regional legal and policy instruments. The main instrument is the SADC Treaty of 1992 that came into force in 1993 after the requisite two-thirds of the Member States ratified. The Treaty has various Protocols (which are part of the Treaty and are read as one) that are intended to stimulate cooperation and collaboration in specific areas.

Harmonisation, as envisaged by the concept of regionalisation, has occurred in relation to CBNRM. Although there is no specific Protocol on CBNRM, other Protocols contain provisions that foster sector-specific cooperation on key CBNRM elements. These Protocols include, the SADC Protocols on: Wildlife Conservation and Law Enforcement; Shared Watercourses; Forestry; Fisheries; Mining; and Tourism.

4.3.2 Lessons for harmonising CBA

Unlike CBNRM, there has been no conscious effort to harmonise CBA as a concept from the regional level. This is mainly because CBA is still in its infancy. Most of its

elements, approaches and frameworks remain untested. It is therefore critical that as a community-led initiative, it first goes through the process of validation through practice. Indeed, it is through practice that its benefits to communities can be verified, appreciated and adopted as regional model for the benefit of communities in the region.

End notes - Getting CBA to work

13. The value accorded to the resource need not necessarily be economical. It could be social or cultural
14. For instance, there were conventional projects that could achieve the expected benefits of infrastructure and services such as the mid-Zambezi project during the time. This project could have provided the communities with their needs and at the same time maintain the land use and livelihood options that existed for the communities i.e. agriculture
15. Adapted from the definition of “sustainable use” contained in the Convention on Biological Diversity (Article 2)
16. Third parties in this context refer to public and private sector actors such as departments of wildlife and wildlife safari companies respectively.
17. The government decree currently only applies to the Zambezi Valley Districts of the country.
18. The conditions are that the community needs to organise itself in a participatory and representative manner that is endorsed by the district authorities and the Department of Wildlife and National Parks
19. It should be noted however that the National Fisheries Management and Aquaculture Policy of Malawi, formulated in 2001 intends to promote stronger devolution in the fisheries sector by proposing the establishment of local fisheries management authorities such as Beach Village Committees (BVCs) to co-manage fish resource with the government. The Policy also proposes that government strengthen the capacity of these authorities to participate effectively in fish resource management.
20. An example is a Botswana government decree on “Community Tourism and Hunting Development Activities” which empowers communities to be entrepreneurs in the wildlife and tourism sectors

5. Ways forward for the Regional CBNRM Forum

The CBNRM Forum is the platform through which several CBNRM practitioners learn from each other as well as influence policy makers and other stakeholders in the region. It also facilitates good practice and provides a mechanism for peer review of performance. As such, it is a critical platform through which climate change adaptation could be integrated into ongoing community-based natural resource management initiatives in the region. The main issues that the Forum needs to take into consideration for it to effectively integrate climate change in its activities, or those of its members are the tools for community adaptation, engagement with adaptation fora and access to adaptation finance. This section provides strategic information specifically for the Regional CBNRM Forum in southern Africa, to upscale its work on the linkages between CBNRM and CBA. It is divided into three sub-sections. The first sub-section outlines tools for integrating adaptation into CBNRM. The second outlines options on how to engage with adaptation fora including a list (database) of organisations operating at both national and regional levels, whose work involves elements of CBA. This is important in identifying suitable organisations to partner with the Forum for future work on the linkages. The third sub-section identifies possible funding sources to support the Forum in future climate change work.

5.1 Tools for integrating adaptation into CBNRM

Building upon the work of disaster risk reduction, food security, poverty analysis and sustainable livelihoods there have been successful initiatives by national, regional and international agencies to develop frameworks for understanding vulnerability and adaptive mechanisms. This section summarises and discusses some of these tools, methods and approaches.

Community-based Risk Screening Tool for Adaptation and Livelihoods (CRISTAL)

This tool was developed by the International Institute for Sustainable Development (IISD), the World Conservation Union (IUCN) and the Stockholm Environment Institute (SEI-US). CRISTAL is an interactive, step by step tool for quantifying livelihood components in relation to hazards. The tool is designed to help project designers and managers integrate risk reduction and climate change adaptation into community level projects. This is based on the fact that the impacts of climate change which include less predictable rainfall, more frequent droughts, rising sea levels, new pest and disease outbreaks, disappearing sea ice are increasingly being felt by people living around the world. These changes have real implications for farmers, fishers, foresters and others who rely upon natural resources for their living. These groups suffer disproportionately from climate variability and change, particularly in developing countries. Community level development projects can play a critical role in helping people adapt to the impacts of climate change through activities that among other things, restore ecosystems, strengthen local capacities for risk management and diversify livelihoods. However the tool has some weaknesses as focus is laid heavily on hazards (with no account of seasonal or projected changes), coping strategies rather than adaptation, and the impact on existing projects, rather than communities. Moreover, quantification is not carried forward to make an assessment of vulnerability.

Further details about the tool are available at:

www.iisd.org/pdf/2007/brochure_cristal.pdf

www.iisd.org/cristaltool/download.aspx

www.cristaltool.org

Climate Vulnerability and Capacity Analysis (CVCA)

The CVCA methodology was developed by CARE International to provide a framework for analysing climate change vulnerability and adaptive capacity at the community level. Recognising that local actors must drive their own future, the CVCA prioritises local knowledge on climate risks and adaptation strategies in the data gathering and analysis process. The tool has two main objectives. Firstly it aims to analyse vulnerability to

climate change and adaptive capacity at the community level. It provides guidance and tools for participatory research, analysis and learning. It also takes into account the role of local and national institutions and policies in facilitating adaptation. The second objective of the tool is to combine community knowledge and scientific data to yield greater understanding about local impacts of climate change. One of the challenges of working at the local level on climate change adaptation is the lack of scaled down information on impacts. This is coupled with inadequate data and information on weather and climate predictions. The process of gathering and analysing information with communities serves to build local knowledge on climate issues and appropriate strategies to adapt. The participatory exercises and associated discussions provide opportunities to link community knowledge to available scientific information on climate change. This will help local stakeholders to understand the implications of climate change for their livelihoods, so that they are better able to analyse risks and plan for adaptation. The CVCA methodology is based on a framework of “enabling factors” for CBA. Therefore the utility of the tool is fourfold. It guides a comprehensive and gender-sensitive analysis of vulnerability to climate change, covering all key issues for the analysis stage of projects seeking to integrate climate change adaptation. It also provides practical evidence for advocacy on climate change issues as well as complementing analysis guided by other frameworks, including Gender and Diversity, Livelihoods Frameworks, and Rights-Based Approaches. Lastly it enables compilation of reports on climate vulnerability and adaptive capacity based on the analysis.

The tool faces challenges that it does not provide guidance on selecting and prioritising adaptation options beyond general suggestions of the types of activities that may be appropriate at different levels. Furthermore the tool assumes that a relationship exists with communities. In the absence of such relationship the process of developing trust with communities to undertake participatory analysis can be cumbersome and time consuming. – Adapted from Care International.

Further details on the tool are available at:

www.careclimatechange.org/cvca

Climate Change and Environmental Degradation Risk and Adaptation Assessment (CEDRA)

CEDRA was developed by Tearfund to help development workers access and understand the science of climate change and environmental degradation and to compare this with local community experiences of climate change in order to provide a basis for planning adaptation measures. The CEDRA tool provides guidance to a sequential process of:

- a) Identifying climatic and environmental hazards from scientific and community sources
- b) Prioritising hazards to address
- c) Selecting appropriate adaptation options
- d) Identifying what to do if risks to existing projects are unmanageable
- e) Considering new projects and new project locations and continual review

CEDRA has a field tool checklist which provides a broad list of possible impacts of climate change and environmental degradation, and suggests possible adaptation options.

The key utilities of the tool are to conduct a project risk assessment to determine the extent to which climate and environmental change may affect a project and to decide whether to continue with the project, stop it, or start a new one in view of risks posed by climatic and environmental change. The other use of the tool is to identify the most appropriate adaptation options to address various impacts of climatic and environmental changes within the context of the project. Though the CEDRA tool includes the quantification of risks posed by various climate related hazards which allows prioritisation and selection of adaptation options which assumes that the greater the risk the greater need for adaptation options (Wiggins, 2009), it has its own weaknesses. The tool does not guide users in prioritising the resources most important to adaptation as well as not dealing with gender dimensions of vulnerability to climate change and environmental changes and adaptation. Furthermore the tool does not address policy and institutional issues that have implications for adaptation as well as the capacities and partnerships required by government, civil society and communities to effectively implement adaptation strategies. – Adapted from Tearfund.

Further details about CEDRA are available at:

<http://tilz.tearfund.org/Topics/Environmental+Sustainability/CEDRA.html>

Framework of Milestones and Indicators for Community-based Adaptation (CBA)

In addition to Climate Vulnerability Capacity Analysis (CVCA), CARE International developed the Community-based Adaptation (CBA) Framework. The tool presents a range of “enabling factors” which must be in place at household/individual, community/local and national levels in order for effective community-based adaptation to take place. These enabling factors are linked to four inter-related strategies which are the promotion of climate-resilient livelihoods strategies; disaster risk reduction strategies to reduce the impact of hazards on vulnerable households; capacity development for local civil society and governmental institutions; and advocacy and social mobilisation to address the underlying causes of vulnerability. The Framework of Milestones and Indicators elaborates the CBA Framework with a set of milestones and indicators to plan activities and to track progress towards achieving the enabling factors. It also defines the set of indicators provided. The framework is designed to show the range of results that adaptation projects could aim to achieve at household/individual, local government/community and national levels. No project will be able to achieve all of these results. The framework is intended to provide a “menu” of milestones and indicators to guide project teams in selecting specific indicators that are within the scope and focus of their project. The use of this tool is limited because it does not identify the

tools required to monitor progress towards achievement of the milestones and indicators. Project teams must identify appropriate tools to monitor and evaluate the selected indicators. – Adapted from Care International.

Further details about the tools are available at:

www.careclimatechange.org/files/toolkit/CBA_Framework.pdf

Climate Context Monitoring Tool

The Climate Context Monitoring Tool is designed to guide a process of monitoring changes to the climate context over the life of a project and to plan adjustments to the project in light of these changes. The tool provides a basic set of questions for reflection by project teams. Ideally this tool will be used on a regular basis, and the information integrated into project progress reports. Some of the questions include what were the key climate hazards identified during the analysis and design stages of the project, how these hazards are being monitored during project implementation, a description of any changes in the frequency or intensity of climate hazards during the life of the project and whether any extreme climate events occurred during the reporting period. Furthermore the tool describes how project activities and stakeholders have been affected by climate hazards, how project activities and stakeholders have been affected by other changes to the context and the measures taken to address any negative impacts, including adjustments to project activities, and support provided to stakeholders to manage the impacts. A description of the process undertaken to decide on the measures taken to address the negative impacts, including how stakeholders were involved in the decision is also part of the tool as well as assessing whether the measures were effective in managing the negative impacts. If not, the tool requires information on what is proposed in future to address the impacts and the budgetary implications of such adjustments to project activities. – Adapted from Care International.

Further details about the tool are available at:

www.careclimatechange.org/files/toolkit/Climate_Context_Monitoring_Tool.pdf

The National Adaptive Capacity Framework (NAC)

One other important tool for climate change adaptation practitioners is the National Adaptive Capacity Framework (NAC) that was developed by the World Resources Institute (WRI) and partners. The tool identifies the fundamental set of functions that all countries will need to perform to effectively adapt to climate change. The framework can be used to assess how well the functions are being performed, in order to identify opportunities and priorities for building adaptive capacity and implementing key activities. It also helps identify the strengths and gaps in a country's adaptation system. The framework is based on the assumption that, while each country will need to adapt based on its specific context, there are a few "adaptation functions" that all countries will need to perform. The framework incorporates adaptation functions such as assessment, prioritisation, coordination, information management, and climate risk reduction.

It comprises a comprehensive analysis of National Adaptation Functions that could support in-country planning and capacity building processes. Each set of capacity function is accompanied by capacity questions and elements to look for. This enables users to gather information and evidence and decide whether each element is present and whether it is adequately addressed in their country. The framework incorporates assessment of biophysical, socio-economic and political issues that are pertinent to effective integration of adaptation. It also takes into consideration the cost and benefit analysis of adaptation. The tool is therefore important in examining opportunities and barriers to adaptation, identifying target issues for advocacy and to render assistance in identifying priority areas for capacity building of national government stakeholders. The limitations of the tool are that it only looks at the functions and not at the capacities and assets which would be needed to undertake them. Secondly, the tool is only applicable at national level and it doesn't assist with local level planning. – Adapted from the World Resources Institute (WRI).

Further details on this tool are available at:

www.wri.org/project/vulnerability-and-adaptation/nac-framework

Opportunities and Risks of Climate Change and Disasters (ORCHID)

The Opportunities and Risks of Climate Change and Disasters (ORCHID) tool was developed by IDS, DFID and CCDC. This process based tool is designed to be a light touch screening process for donor programmes. The process utilises quantitative inputs climate science which are applied to the risk assessment of programmes usually at wide scales, and using directional trends rather than discrete figures. The tool utilises project documents and interviews with project staff as well as past trend in vulnerability and disaster risk. ORCHID aims to raise awareness of climate risk management and future climate change among staff, to stimulate dialogue with donor partners, to integrate disaster risk reduction and climate change adaptation policies and activities.

The process makes recommendations for how programmes might enhance risk management through adaptive practices and cost benefit analysis and sector economic assessment are undertaken for areas where clear adaptation options can be discerned and where sufficient data is available.

Further details about the tool are available at:

www.adaptationlearning.net/guidance-and-tools/opportunities-and-risks-climate-change-and-disasters-orchid

The Participatory Tool on Climate and Disaster Risks

The Participatory Tool on Climate and Disaster Risks can be associated with community-based adaptation (CBA) and sustainable livelihood approaches. Its structure is largely based on the Community-based Risk-Screening Tool – Adaptation and Livelihoods (CRiSTAL). The tool aims at helping community-level project developers, managers and coordinators to analyse existing or planned development projects with respect to

climate change and disaster risks. More specifically, the tool seeks to help users to understand how climate risks and other natural hazards affect local livelihoods in their project area, learn how the local population (men and women) deals currently with these hazards and evaluate how existing or planned projects affect local livelihood resources that are vulnerable to climate and disaster risks and/or relevant to cope with those risks. This is done considering gender-specific issues, with the identification of how existing or planned projects affect greenhouse gas emissions and thereby contribute to climate change. In such event the tool identifies the need to adjust existing projects or design new activities designed to strengthen their beneficiaries' adaptive capacities in dealing with climate and disaster risks, and consider measures to improve a projects' impact on the global climate. It is the explicit purpose of this tool to integrate considerations of climate change and disaster risks into all kinds of community-level development activities. The tool can also help to devise advocacy strategies and can be used if no specific project is being screened.

Further details about the tool are available at:

www.adaptationlearning.net/sites/default/files/CliDR%20Eng_Vers5_0.pdf

From Vulnerability to Resilience: a framework for analysis and action to build community resilience

From Vulnerability to Resilience, or V2R, was developed and written with the needs and interests of Practical Action programme staff in mind. However, the issues and principles in the document are also relevant to a much wider audience including practitioners (NGOs and local government staff), researchers, and policymakers working in livelihoods, disaster management and climate change adaptation. The tool is a framework for analysis and action to reduce vulnerability and strengthen the resilience of individuals, households and communities. The framework sets out the key factors that contribute to peoples' vulnerability, exposure to hazards and stresses; fragile livelihoods; future uncertainty; and weak governance. It provides detailed explanations of the linkages between these factors, as well as ideas for action to strengthen resilience. It is intended to provide guidance to the reader, rather than dictate a set way of doing things. The tool can also be adapted to suit communication to other audiences such as community-based organisations (CBOs).

Further details about the tool are available at:

http://practicalaction.org/text/docs/reducing_vulnerability/v2r-book.pdf

5.2 Adaptation engagement approaches - adaptation fora (global and African)

The CBNRM forum is in a strong position to contribute to on-going discussions and developments on adaptation through participating in relevant fora, such as the Global Community-based Adaptation Initiative, Africa Adapt and others. In addition to bringing its own influence, the CBNRM forum benefits from the wealth of experience behind it. Further to livelihoods and adaptation at community level, an angle that CBNRM could pursue is ecosystem-based adaptation.

5.2.1 Engagement by the Regional CBNRM Forum

The organisations involved in climate change adaptation activities in southern Africa are varied. They predominately consist of national governments; civil society organisations; and inter-governmental organisations that operate mainly in isolation to each other without much structured coordination. As such, the mode of engagement by the CBNRM Forum will vary depending on the nature of the organisations involved. For instance, the Forum can have informal engagements with civil society organisations; and a formal approach with government bodies. This is also true for inter-governmental organisations with climate change programmes such as the COMESA Climate Change Initiative. This initiative aims to, amongst other things; promote and enhance collaboration, synergy, partnerships and effective participation of governments, business community, civil society and other stakeholders in climate change matters. In order for the CBNRM Forum to participate, it will have to formally connect with the COMESA Secretariat. Another similar inter-governmental programme is the SADC Framework on Climate Change Programmes (that is currently under development). For a list of organisations working on climate change-related projects in southern Africa please refer to Annex 1.

5.3 Funding adaptation

Climate change mitigation and adaptation will require enormous funds in the coming decades, especially for developing countries. The ODA estimates that US\$120 billion will be needed by 2020, with many putting the figure even higher. In developing countries, the World Bank (2006) estimates that climate-proofing development investments (e.g. ODA and concessional finance supplied at relatively favourable terms) and foreign direct investment will cost between US\$9-US\$41 billion annually. However, as explained by Ayers and Huq (2008) this figure has been charged as inadequate and not ignoring the cost to households and communities to fund their own adaptation needs. Other studies estimate the cost of adaptation to be much higher; for example, Oxfam (2007) cites a baseline of US\$50 billion annually and the UNDP (2007) estimated it will cost US\$86-US\$109 billion annually²¹. See Parry *et al.* (2009) for a report examining the uncertainty and complexity in climate finance, broken down by sector.

Adaptation funds should be “new and additional” rather than a diversion of existing development assistance (Smith *et al.*, 2011); however, it is often difficult to disentangle CCA from development activities; and keeping adaptation funds separate could lead a duplication of effort and even misallocation of resources. Several special climate funds have been established; though many forecast that ‘substantial (perhaps most) funds will probably be channeled through multilateral development banks, bilateral development programmes, non-governmental organisations and civil society’ (Smith *et al.*, 2011). This section will focus on the former, describing the emerging funding architecture under the UNFCCC.

Climate change adaptation is channeled through a growing network of funds including the Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF); and the Adaptation Fund (AF). Most are relatively small funds based on voluntary pledges and contributions from donors with the exception of the Adaptation Fund. The table on page 86 lists the current climate funds relevant for this paper.

Climate Fund	Type	Administered by	Total Pledged (US Dollars)
Adaptation Fund	Multilateral	Adaptation Fund Board	US\$229 million
Clean Technology Fund	Multilateral	World Bank	US\$4433 million
Congo Basin Forest Fund	Multilateral	AfDB	US\$165 million
Forest Carbon Partnership Facility Readiness Fund	Multilateral	World Bank	US\$229.5 million
Forest Carbon Partnership Facility Carbon Fund	Multilateral	World Bank	US\$204.5 million
Forest Investment Programme	Multilateral	World Bank	US\$559 million
GEF Trust Fund (GEF-5)	Multilateral	GEF	US\$3540 million
Global Climate Change Alliance	Multilateral	EU	US\$226 million
International Climate Fund	Bilateral	UK	US\$4590 million
International Climate Initiative	Bilateral	Germany	US\$618.3 million
Least Developed Country Fund	Multilateral	GEF	US\$414.95 million
Special Climate Change Fund	Multilateral	GEF	US\$216.55 million
Strategic Climate Fund	Multilateral	World Bank	US\$1935 million
UN-REDD Programme	Multilateral	UND	US\$150.85 million

To illustrate, the Least Developed Countries Fund (LDCF) is made up of voluntary contributions from countries and currently stands at nearly US\$415 million in grants. The main aim of the LDCF is to assist LDC countries to prepare their National Adaptation Programmes of Action (NAPAs), which identify the priority areas for adaptation within each country. To date the LDCF has approved US\$217 million for 47 projects in 48 countries (over 55% in African countries). The LDCF has also mobilised more than US\$919 million in co-financing. In addition, the Special Climate Change Fund (SCCF)

supports adaptation and technology transfer specifically for developing countries with a focus on the most vulnerable countries in Africa, Asia, and the Small Island Developing States. The projects are country-driven and integrated into national sustainable development and poverty-reduction strategies. The Fund currently has US\$180 million pledged with US\$106 million approved for projects. To date, US\$91.6 million has been distributed. Lastly, under the Kyoto Protocol, the Adaptation Fund was established as a two per cent levy on certified emission reduction credits produced by Clean Development Mechanism (CDM) projects

Countries	Total pledged	Total Committed	Programmes
Australia	AUD 599 million	-	5
Belgium	EUR 150 million	EUR 42 million	-
Canada	CAD 400 million	-	-
Denmark	DKK 1200 million	DKK 308 million	16
European Union	EUR 150 million	EUR 50 million	8
Finland	EUR 110 million	-	7
France	EUR 1260 million	EUR 1260 million	24
Germany	EUR 1260 million	EUR 291.9 million	51
Iceland	US\$ 1 million	-	-
Japan	US\$ 15000 million	-	-
Luxembourg	EUR 9 million	EUR 9 million	-
Malta	EUR 1 million	EUR 1 million	2
Netherlands	EUR 310 million	EUR 310 million	7
Norway	US\$ 1000 million	US\$ 382 million	20
Portugal	EUR 36 million	EUR 12 million	-
Slovenia	EUR 8 million	-	2
Spain	EUR 375 million	-	9
Sweden	EUR 800 million	-	17
Switzerland	CHF 140 million	-	-
United Kingdom	GBP 1500 million	GBP 568 million	8
United States		US\$ 1,700 million (for 2010)	-

Unlike the LDCF and SCCF, the Adaptation Fund falls under the Kyoto Protocol and is unique in that the AF Board independently manages it. 'Some unique features of the fund include direct access, which aims to simplify and accelerate the process by which resources for adaptation flow to developing countries' (Reid *et al.*, 2010). Countries can make funding submissions directly to the AF and can also designate agencies such as NGOs to make these submissions.

In 2009, the most concrete commitment to come out of the international negotiations was the establishment of Fast Start Climate Finance. Thirty billion US\$ was pledged to developing countries between 2010-12. Lastly, long term funding will need to be secured.

In 2010, the UN Secretary-General established a High Level Advisory Group on Climate Change Financing to study potential sources of revenue that will enable mobilisation of US\$100 billion per year in 2020. These funds would be raised from a mix of public and private sources. The Group will develop practical proposals on how to significantly scale up long term financing for mitigation and adaptation strategies in developing countries from both public and private sources²². Following from this, the Green Climate Fund was established for long-term funding. It will function under the guidance of, and be accountable to the Conference of the Parties (COP). The Fund will be governed by a Board made up of twenty-four members with equal representation from developed and developing countries. The Fund will be administered by a trustee and supported by a professional secretariat with the World Bank serving as the interim trustee. The COP further established a Transitional Committee of forty members to design the details of the fund. Finally, the COP will establish a Standing Committee which will assist the COP in exercising its functions with respect to the mobilisation, delivery and verification of long-term finance. The specific roles and functions of the Standing Committee are to be developed.

5.3.1 Potential for generating mitigation finance

The potential for several countries in the region to use their natural resources for climate change mitigation through REDD+ approaches is recognised, and REDD+ initiatives are still being developed in the region e.g. in Zambia, Mozambique. While this study does not go into detail to assess the REDD+ potential through the CBNRM route, it is an area that the CBNRM Forum should investigate further. The earlier study by Bond *et al.* 2010 provides useful analyses on the synergies between CBNRM and REDD+ in southern Africa, which shows that again, CBNRM investments provide a strong basis for pro-poor REDD+. If viable, REDD+ revenues may increase the level of benefits that communities receive from sustainable management of resources thereby increasing the level of incentives.

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21. 'Agrawala and Fankhauser (2008) note that, although there is a comforting convergence of estimates, they are not substantive studies, they borrow heavily from each other, and they have not been peer reviewed' (Smith *et al.* 2011; also See Parry *et al.* 2009).
22. www.un.org/wcm/content/site/climatechange/pages/financeadvisorygroup

6. Conclusion

The value and basis for comparatively assessing CBNRM and CBA is premised on the fact that both approaches are anthropocentric, and therefore provide important alternatives to:

1. Manage natural resource challenges that affect communities
2. Respond to risks and impacts associated with climate change that affect communities.

The central and common theme of the two approaches is the role of, and impact on, people or communities in managing and responding to challenges respectively.

The concluding section summarises the key lessons that can be drawn from CBNRM and CBA and the complementarities of the two approaches.

6.1 Key lessons for CBA

The CBNRM approach is a tried and tested model. It ossifies clearly defined elements that have led to its success; including: sustainable use, devolution, incentives and community proprietorship. These four pillars of CBNRM, through experience, promote community capacity to adequately respond to natural resource management challenges. As such they provide vital lessons for the emerging CBA model. It has been demonstrated that the twin objectives of CBA i.e. 'decreasing community vulnerability' and 'enhancing community adaptive capacity'; can be improved by lessons drawn from implementation of CBNRM programmes and projects. However, these lessons tend to revolve around objectives and issues that are common to the two concepts i.e. poverty reduction, governance and ecosystems. The major lessons are outlined in the table below.

Key lessons for CBA drawn from CBNRM

Poverty reduction

1. Sustainable livelihood approaches can assist in decreasing community vulnerability
2. Direct and visible incentives are crucial for communities to be motivated to embrace CBA initiatives
3. Sustainable household cash income is an important factor in enhancing community capacity to respond to and cope with vulnerabilities caused by climate change-related factors.

Governance

1. Local community capacity can enhance community response to external shock
2. The institutional architecture in CBA projects should recognise existing traditional institutional structures for the projects to be effectively implemented
3. Traditional leadership plays an important role in symbolising community ownership over CBA projects
4. Relationships of trust are an important factor in promoting communal proprietorship over CBA initiatives.

Ecosystems

1. Sustainable environmental management enhances community adaptive capacity and decreases vulnerability.

It is perhaps not surprising that 'poverty reduction', 'governance' and 'ecosystems' are issues within CBNRM that resonate most for CBA. This is because these issues are amongst the key drivers of the objectives of both CBNRM and CBA. They are also

issues that have been successfully developed in CBNRM and relatively established in CBA. It is therefore easier for CBNRM lessons to influence similarly existing areas in CBA, rather than on other areas that are exclusive to each of them.

These key lessons are not only important to enhance the design and implementation of CBA, but are also important indicators for the southern Africa CBNRM Forum to use in integrating adaptation in their activities. One of the significant questions facing CBA is how to situate and filter activities into larger, national adaptation policies and programmes. As witnessed with CBNRM's own evolution, these projects cannot succeed in isolation - they require legal and institutional changes to support community activities. CBNRM can offer a blueprint for how to scale up CBA.

6.2 Summing up - new risks, new opportunities

Finally, CBNRM can also learn from early work within CBA. Although this paper is anchored in CBNRM case-studies with the goal of informing CBA projects overall, they are two key messages the Forum and the wider CBNRM community should take on board. First, climate change poses new risks for communities in southern Africa: i.e. long-term changes that are not currently addressed within traditional coping strategies. New and existing vulnerabilities may be exacerbated as ecosystem changes under future climatic conditions. Second, climate change will fundamentally increase the level of risk; and as such, it must be strategically factored into community decision-making. CBA has already cultivated a variety of participatory methods for assessing risk and vulnerability which can be applied to existing CBNRM activities. There may also be new opportunities emerging around REDD+ that offer new incentives for communities. Ultimately, the twin approaches of CBNRM and CBA have similar broad goals and complimentary processes of putting community welfare first. There are still many areas of further study but a strong dialogue between the CBNRM and CBA communities would reinforce and reward both programmes of work.

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Annex 1

Organisations and projects working on Climate Change Adaptation in southern Africa

Adaptation to Climate Change in Eastern and Southern Africa (ACCESA)

Purpose: To reduce the vulnerability of communities in eastern and southern Africa to the impacts of climate change, thereby improving their well-being and protecting their livelihoods.

Current activities: Community-based fire management in central Mozambique. Bush fires are an issue of increasing concern in Mozambique, and their frequency and intensity could rise due to climate change. AMBERO-IP and Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ) have responded to this situation by providing training in fire prevention and management at the community level, helping district governments develop and implement policies and processes for monitoring and responding to fire threats and occurrences, and encouraging policy coherence at the national level around fire management.

Donors and scale: The Global Environment Facility's Strategic Priority on Adaptation, The Government of the Netherlands and The Government of Norway, Mozambique.

Further information: www.iisd.org/climate/vulnerability/adaptation.asp

Advancing Capacity to support Climate Change Adaptation (ACCCA)

Purpose: Communicating climate risk information in clear terms that are relevant to decision-makers; addressing climate risks and adaptation in an integrated, multidisciplinary way; the importance of engaging stakeholders substantively; and the long-term benefits of partnering institutions from scientific and policy communities for understanding and managing climate change risk.

Current activities: Supporting adaptation schemes and capacity building to address climate risks in:

- Malawi - Audiovisual Tools for Community-based Adaptation: Bridging the Meteorological Service and the Red Cross' work in Malawi
- Tanzania - Adaptation Strategies and Challenges Associated with Climate and Ecological Changes to the Lake Victoria Community in Tanzania
- South Africa - Adaptation options for impoverished Mshayazafe settlement

Donors and scale: Funded by the European Union. In southern Africa it covers Malawi, Tanzania and South Africa SADC States.

Further information: www.acccaproject.org/accca/
http://ec.europa.eu/development/icenter/repository/env_cc_brochure_EU_Action_EN.pdf

Assessments of Impacts and Adaptations to Climate Change (AIACC)

Purpose: Linkages between AIACC Regional Studies and National Communications to the United Nations Framework Convention on Climate Change.

Current activities:

- Greenhouse gas inventory, mitigation of climate change through land use practices, and vulnerability and adaptation of rangelands
- Vulnerability and adaptation assessment for plantation
- Integrated assessment of food security, land use, land cover
- Food security, water, land use vulnerabilities and adaptation
- Benefit-Cost analysis of adaptation responses
- Human health, climate change, and adaptive responses
- Impacts of climate change on tourism and the coastal/marine
- Environment and adaptation strategies

Donors and scale: South Africa, Malawi, Zambia, Zimbabwe, and Mozambique, Botswana, Tanzania, Seychelles.

Further information: www.aiaccproject.org/publications_reports/AIACC_Links_to_UNFCCC_NC.pdf

Building capacity to adapt to climate change in Zambia and Zimbabwe

Purpose: The project seeks to improve incentives and opportunities for households in southern Zambia and south western Zimbabwe to cope with climate change. It will do so by investing in improved production technologies of practical value to small scale farmers and encouraging their adoption by linking their dissemination with complimentary investment in weather forecasting and projects of a useful nature (humanitarian relief, input provision, product marketing). The idea is to make the capabilities rather than the vulnerabilities of the poor the starting point for moderating the negative effects of climate change on agricultural production.

Period: 27/03/2007 to 27/03/2010

Current activities: Key interventions will include strengthening local institutions, building demand led rural services, designing decision support tools for managing smallholder assets including livestock and developing new technologies for natural resource use under variable rainfall. Once identified and evaluated the adaptation strategies will be used to prevent or mitigate the effects of climate change.

Donors and scale: Funded by IDRC and covers Zambia and Zimbabwe (Midlands State University www.msu.ac.zw)

Further information: www.idrc.ca

Canada Climate Change Development Fund (CCCCDF)

Purpose: To promote activities addressing the causes and effects of climate change in developing countries, while helping to reduce poverty and promote sustainable development

Current activities: Preparation and implementation of national adaptation programmes of action (NAPAs): tools to identify priority activities that respond to the urgent needs of developing countries regarding adaptation to climate change.

Donors and scale: CIDA

Further information: www.acdi-cida.gc.ca

Capacity Strengthening in Least Developed Countries for Adaptation to Climate Change (CLACC)

Purpose: Strengthening the capacity of organisations working with civil society in environment and development while integrating climate change issues in the planning and implementation of projects.

Period: 2003 ongoing

Current activities: CLACC supports LDCs to adapt to climate change. Because their degree of vulnerability is high, the programmes in LDCs require long-term capacity strengthening within governments as well as civil society. In its first phase in 2004/2005, the CLACC project worked to strengthen the capacity of four regional partners in South Asia (BCAS) East Africa (ACTS), West Africa (ENDA) and southern Africa (ZERO). CLACC focused on these regions because they include the communities that will be disproportionately and negatively affected by climate change. CLACC now focuses on 15 vulnerable countries in the LDC group (twelve in Africa and three in South Asia). It continues to enhance the capacity of organisations based in civil society who are working with the most vulnerable groups by:

- Strengthen the capacity of civil society in LDCs to adapt to climate change creating greater adaptive capacity among the most vulnerable groups
- Establish an information and knowledge system catering to countries dealing with the adverse impacts of climate change
- Mainstream the NAPA process with key non-governmental stakeholders

Donors and scale: Funded by the Royal Norwegian Ministry of Foreign Affairs, DFID, NORAD, SIDA and Dexter Trust-Embassy of the Federal Republic of Germany. In southern Africa it covers Zimbabwe (ZERO), Malawi (CURE), Mozambique (GED) and Zambia (EECZ).

Further information: www.clacc.net

Capacity Development and Knowledge Management (Cap-Net)

Purpose: Cap-Net is an international network for capacity building in Integrated Water Resources Management (IWRM). It is made up of a partnership of autonomous international, regional and national institutions and networks committed to capacity building in the water sector.

Current activities: Climate Change Adaptation, Hydroclimatic disasters

Donors and scale: all SADC countries.

Further information: www.cap-net.org

Climate Change and Development project (IUCN)

Purpose: Mainstreaming Climate Change Adaptation in eastern and southern Africa

Period: December 2007 to December 2010.

Current activities: To ensure that climate change related policies and strategies lead to adaptation activities that emphasise the role of forests and water resources in supporting people's livelihoods and associated farming systems. This will be done by providing the knowledge, tools and capacity required to reduce vulnerability and enhance adaptive capacity to climate variability and change at the local, national and regional levels.

Donors and scale: Funded by the Finnish Government and implemented in Zambia, Tanzania and Mozambique.

Further information: www.iucn.org/about/work/programmes/forest/fp_our_work/fp_our_work_thematic/fp_our_work_fcc/fp_forests_climate_our_work/fp_forests_climate_our_work_adaptation/fp_forests_climate_our_work_mainstreaming

Climate Protection Programme (CaPP)

Purpose: International cooperation enterprise for sustainable development with worldwide operations.

Current activities: Climate policy, mitigating greenhouse gas emissions (including CDM activities) and Adaptation to the impacts of climate change

Donors and scale: GTZ. Tanzania, South Africa, Mozambique.

Further information: www.gtz.de/en/themen/umwelt-infrastruktur/umweltpolitik/4160.html

CLIMTRAIN project- Climate change mitigation and adaptation.

Purpose: Agriculture and rural development - eradicating rural poverty in developing countries.

Current activities:

- Strengthen in-house knowledge on climate change issues in the context of rural development;
- Share knowledge by developing training materials not only to be used internally, but also disseminated externally to IFAD stakeholders;
- Build new partnerships on climate change with other United Nations institutions and development actors, as well as reinforcing existing networks

Donors and scale: IFAD. All SADC states.

Further information: www.ifad.org/climate/climtrain/

Community-based adaptation to climate change in Africa

Purpose: This project proposes to carry out climate change adaptation pilot projects in communities in 8 African countries 6 of which are least developed countries. The communities will be selected in collaboration with relevant actors particularly metrological services, using the South-South-North Adaptation (SSNAPP). The projects implemented by NGOs will take learning by doing approach, identifying ways of communicating climate change information to poor communities and from communities to other stakeholders.

Period: 13/02/2008 to 13/02/2011

Current activities: The lessons learned will be shared with stakeholders at the local, national, regional and international levels and inform ongoing initiatives promoting climate change adaptation and sustainable development.

Donors and scale: Funded by IDRC and covers Malawi, Tanzania, South Africa, Zambia, Zimbabwe (African Centre for technology Studies) www.acts.or.ke

Further information: www.idrc.ca

Community-based carbon project in Mozambique- IIED

Purpose: To formulate a programmatic forestry sink project in Zambézia Province, Mozambique which will benefit poor smallholder farmers and be managed locally in line with the national decentralisation policy.

Period: 2008

Current activities: Drawing from the experience of existing payment for ecosystem services (PES) schemes, including the voluntary carbon market, designing a payment scheme, which will keep to a minimum the costs involved in contracting, monitoring carbon, transferring payments to individual farmers and enforcing contracts.

Donors and scale: Funded by PROFOR and DANIDA and covers Mozambique's Zambézia Province.

Coping with drought and climate change (Environmental Management Agency)

Purpose: The project seeks to develop and pilot a range of long-term adaptation measures in the agriculture sector to reduce the vulnerability of small-holder farmers and pastoralists in rural Zimbabwe to current and future climate change related shocks.

Period: 7 November 2007 - 31 December 2012

Current activities: Long term policy oriented approaches for adaptation to climate change among rural men and women in agriculture through:

- Developing local level capacity to expand the knowledge base on climate change to support effective adaptation in agriculture sector
- Developing and implementing a range of viable pilot demonstration measures in response to identified climate risks
- Developing local capacity to use climate early warning systems to strengthen adaptation/livelihood strategies
- Disseminating project generated lessons and fostering public awareness about potential impacts of climate change

Donors and scale: Funded by UNDP the project covers the Chiredzi district in Zimbabwe.

Further information: www.undp.org.zw/focus-areas/environment-energy/coping-with-drought-and-climate-change/

Danish Action Programme

Current activities:

- Awareness raising about national and local impacts of climate change
- Capacity building related to climate data and forecasting
- Interdisciplinary master and PhD training, and case study analysis at provincial level, where climate information, socioeconomic impacts and policy implementation are considered in an integrated way

Donors and scale: Danish Embassy. Mozambique.

Further information: www.netpublikationer.dk/um/5736/html/chapter05.htm

Economics of Climate Change adaptation in Least Developed Countries- IIED

Period: 2008-2009 (Phase 1 Preparation)

Current activities:

- To carry out the first phase of a major programme of collaborative economic research and capacity-building on the costs of climate change impacts and costs and benefits of adaptation in twelve Least Developed Countries.
- To address these gaps in data on costs and benefits, the Climate Change Group and the Environmental Economics Programme are starting a major programme of work with partners in the Least Developed Countries. This aims to build capacity in conducting economic analysis of climate change and feeding this into local and national policy-making and negotiating positions.

Planned/future activities: Building on the well-established network of CLACC partners we will form a network of economists in LDCs and support them in undertaking robust economic analyses of climate change impacts and climate change adaptation at local and national levels. This work will incorporate analysis of non-market impacts of climate change and adaptation. In the first phase we are forming a network, supporting local economists in review of available data and selection of appropriate methodologies and developing a detailed proposal for funding in the second phase.

Donors and scale: Funded by The Innovation Fund (Fund from frame donors on innovation works) it covers Zambia (EECZ) and Malawi (CURE).

Further information: www.iied.org/climate-change/key-issues/economics-and-equity-adaptation/economics-climate-change-adaptation-least-

Financing climate change solutions provides grants to developing countries for projects that benefit the global environment and promote sustainable livelihoods in local communities

Current activities:

- Reduce countries' vulnerability to climate change impacts and helps them build adaptive capacity.
- Mainstream adaptation to climate change into development planning to ensure that vulnerability is reduced
- Help developing countries to submit national communications to the UNFCCC, including a report on national inventories of greenhouse gases
- Support for such new technologies that are not yet cost effective
- Support pilot and demonstration projects in the field of adaptation
- Supports projects that promote a long-term shift towards low emission and sustainable forms of transportation
- Promote energy efficiency by removing barriers to the large-scale application, implementation, and dissemination of cost-effective, energy-efficient technologies and practices
- Help countries remove barriers to developing markets for renewable energies wherever cost-effective

Donors and scale: GEF. All SADC states.

Further information: www.thegef.org/gef/

Food and Water Security under Global Change: Developing Adaptive Capacity with a Focus on Rural Africa

Current activities:

The project aims to provide policymakers and stakeholders in Ethiopia and South Africa with tools to better understand and analyse the consequences of global change—in particular climate change—and to form policy decisions that facilitate adaptation in these countries and beyond.

Donors and scale: International Food Policy Research Institute (IFPRI) Partners: Center for Environmental Economics and Policy in Africa, the Ethiopian Development Research Institute, the Ethiopian Economics Association, and the University of Hamburg. South Africa.

Further information: www.ifpri.org/sites/default/files/publications/rb15_07.pdf

Global Environment Change and Human Security (GECHS)

Purpose: Promotion of understanding and recognition of global environment change as an issue of equity, sustainability and human security.

Current activities: Climate Change in eastern and southern Africa - Impacts, Vulnerability and Adaptation

Donors and scale: Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe.

Further information: www.gechs.org

Integrating Vulnerability and Adaptation to Climate Change into Sustainable Development Policy Planning and Implementation in eastern and southern Africa (ACCESA) – African Centre for Technology Studies (ACTS)

Purpose: The goal of the Integrating Vulnerability and Adaptation in eastern and southern Africa project is to reduce the vulnerability of communities to the impacts of climate change, thereby improving their well-being and protecting their livelihoods.

Current activities: To support achievement of its goal, the objective of the project is to promote the mainstreaming or integration of vulnerability and adaptation to climate change into sustainable development plans and planning processes through a pilot project in Mozambique. Community-based fire management in central Mozambique will reduce the area of forests that currently burn on an annual basis, and provide the skills necessary to address the rise in fire outbreaks anticipated as a result of climate change.

Donors and scale: Funded by the United Nations Environmental Programme Global Environmental Facility (UNEP-GEF) the project covers Mozambique.

Further information: www.acts.or.ke

Integration of climate risk management tools into existing programmes and activities of the Red Cross/Red Crescent Climate Centre

Current activities: Climate change adaptation and natural disaster mitigation through:

1. Developing communication and raise awareness of the consequences of climate change and opportunities for risk reduction.
2. Building climate change knowledge and capacity at all levels of the RC/RC.
3. Mobilising both human and financial resources to areas of greatest need.
4. Serving as an advocate for RC/RC concerns and proposals in international climate policy.
5. Supporting people with high-quality analyses of knowledge and experiences on climate risk management.
6. Using and promoting the use of climate information to reduce vulnerability to extreme weather events and climate variability.

Donors and scale: Malawi, Madagascar, Tanzania, Zimbabwe, Seychelles, Mauritius

Further information: www.climatecentre.org

International Federation of Red Cross And Red Crescent Societies (IFRC)

Purpose: To ensure that the programmes and services of the National Society are scaled up; more responsive to the post conflict and/or development needs of vulnerable people; more effective and sustainable implemented through bilateral or multilateral support.

Current activities: The disaster management (DM) programme will focus on:

- Building strong early warning and early action capacities at national and provincial levels
- Helping national and provincial authorities to improve the national disaster management framework (national disaster response plan) and address issues related to climate change and climate adaptation
- Community-based disaster risk reduction initiatives that will include community preparedness for floods, volcanic eruption and epidemics (cholera)
- Building community resilience to food insecurity will also be a large component of the disaster management programme.

Donors and scale: International Federation of Red Cross And Red Crescent Societies (IFRC), DRC.

Further information: www.ifrc.org

Linking African Researchers with Adaptation Policy Spaces

Purpose: Poor understanding of policy processes tends to reduce the value of research results and the ability of researchers to influence policy. One of the main goals of IDRC's Climate Change Adaptation in Africa (CCAA) programme is to build the capacity of researchers to influence policy.

Period: 18/03/2009 to 18/03/2010

Current activities: Researchers will investigate the complexity of adaptation policy processes in different countries and identify policy spaces; use this knowledge to build policy engagement tools and strategy; develop an analytical framework for investigating climate change adaptation policy processes in Africa; and mentor relationships between participatory action researchers and academic.

Donors and scale: Funded by International Development Research Centre (IDRC) the project covers Malawi.

Further information: www.idrc.ca

Managing Risk, Reducing Vulnerability and Enhancing Productivity under a Changing Climate

Purpose: Opportunities exist to reduce the impact of drought and poverty in the region by capitalising on the inherent adaptability of small-scale farmers. Using case studies from Ethiopia, Kenya, Sudan and Tanzania, this action-research project seeks to contribute to the development of adaptive strategies.

Period: 27/03/2007 to 27/03/2011

Current activities: Gathering knowledge on vulnerability to drought within different social, political and economic contexts, and designing decision-making tools to reduce vulnerability.

Donors and scale: Funded by IDRC and covers Tanzania (Sokoine University of Agriculture)

Further information: www.idrc.ca

Managing Climate Risk to Agriculture and Water Resources in South Africa

Purpose: Given the potential overlap between climate change and existing forms of climate variability, this project seeks to integrate the current treatment of seasonal and annual climate variability with decadal forecasts and long-term scenarios (up to 2050) generated by global climate models, also known as general circulation models (GCMs).

Period: 27/03/2007 to 27/03/2010

Current activities: The project will feature a previously tested model, extensive stakeholder engagement and capacity-building for local scientists. The idea is to enable private and public institutions in the Western Cape and the country to better integrate information on climate change and climate variability into water resources policy, planning and management.

Donors and scale: Funded by IDRC and covers South Africa (University of the Free State)

Further information: www.idrc.ca; www.uovs.ac.za

Miombo Ecoregion Conservation Programme (WWF Zimbabwe Country Office)

Purpose: General Environmental Conservation (currently projects are focused on Freshwater, Forests, Climate Change, Rhino, Traditional Medicinal Plants, Community-based natural resource management).

Current activities:

- Reduced Emissions from Deforestation and Degradation (REDD) in five SADC countries of Botswana, Malawi, Mozambique, Zambia and Zimbabwe
- Climate Finance
- Bio fuel Energy Production (small scale farmers in Zimbabwe & Malawi)
- CBNRM & Climate Change (how can CBNRM approaches help communities adapt)

Donors and scale: Botswana, Malawi, Namibia, Mozambique, Zambia, Zimbabwe

Further information: wwf.panda.org/what_we_do/where_we_work/project/projects/index.cfm?uProjectID=ZW0023

Oxfam Australia

Current activities:

- Providing emergency humanitarian support
- Helping poor communities adapt to climate change
- Campaigning for strong global action on climate change
- Helping women cope with climate change

Donors and scale: OXFAM Australia. South Africa, Malawi, Mozambique and Zimbabwe

Further information: www.oxfam.org.au/explore/climate-change

Resilience and the African Smallholder: Enhancing the capacity of communities to adapt to climate change.

Purpose: This project aims to enhance the ability of households, communities and relevant institutions to respond to changing circumstances with a view to reducing future threats to food security and environmental integrity.

Period: 27/03/2007 to 27/03/2010

Current activities: Working with farmers to identify improved farming technologies and translating the results into action plans at the appropriate institutional level whether local or national

Donors and scale: Funded by IDRC and covers Mozambique, Zimbabwe and Zambia (University of Zimbabwe).

Further information: www.idrc.ca

South African Environmental Observation Network (SAEON)

Purpose: Research facility that establishes and maintains nodes (environmental observatories, field stations or sites) linked by an information management network to serve as research and education platforms for long-term studies of ecosystems.

Current activities: Contacts workshops to investigate the status of current climate change adaptation research in the region.

Planned/future activities: The Japanese ODA strategy focuses on some important aspects in the adaptation domain, including the strengthening of adaptability at society level, assessment of needs based on scientific knowledge and information, and the enhancement of expertise in the adaptation domain.

Donors and scale: Supported by JICA and covers Lesotho, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe.

Further information: www.saeon.ac.za

South African Climate Action Network (SACAN). A network of like-minded Non-Governmental Organisations (NGOs), Community-based Organisations (CBOs) and individuals working on climate change issues in South Africa.

Purpose: Facilitation of local civil society organisations' participation in responding to climate change at national, regional and international levels, and to promote government, industry and individual action to limit human-induced climate change and reduce vulnerability to climate impacts

Current activities:

- To coordinate information exchange on national, regional and international climate policies and issues, amongst civil society organisations and with other interested institutions
- To formulate national, regional and international policy options and position papers on climate related issues
- To undertake further collaborative action to promote effective non-governmental organisations involvement in efforts to avert the threat of global warming
- To initiate civil society capacity building and public awareness raising to promote government and individual action, to limit human-induced climate change to ecologically sustainable levels and develop capacity to adapt to climate change

Donors and scale: South Africa

Further information: www.earthlife.org.za

South African National Biodiversity Institute (SANBI) Climate Change Research Group (CCRG)

Purpose: Projecting the impacts of likely changes in atmospheric Composition and climate on the structure, function and biodiversity of southern African ecosystems and endemic species.

Current activities: To determine the vulnerability of South Africa's botanical diversity to projected climate change and to help plan possible adaptation measures

Donors and scale: South Africa.

Further information:

www.environment.gov.za/climatechange2005/CCRG%20deat%20webpage1.pdf

Southern African Research and Documentation Centre (SARDC)

Purpose: Environment, Water, Research, documentation.

Period: Up to December 2009

Current activities: Impacts, adaptation and Mitigation strategies, Policy responses

Planned/future activities: Proposal for phase 3 has been send to potential funding partners.

Donors and scale: Funded by HBF Henry Boll foundation it covers the Zambezi River basin States (Angola, Namibia, Zambia, Zimbabwe, Botswana, Malawi, Mozambique, Tanzania),

Further information: www.sardc.net

Strategic Framework on Climate Change and Development (SFCCD)

Current activities: The Framework is based on six action areas, each addressing both adaptation and mitigation:

1. Support climate actions in country-led development processes;
2. Mobilise additional concessional and innovative finance;
3. Facilitate the development of market-based financing mechanisms;
4. Leverage private sector resources;
5. Support accelerated development and deployment of new technologies; and
6. Step-up policy research, knowledge and capacity building.

Donors and scale: World Bank. South Africa, DRC, Mauritius, Zambia, Madagascar, Tanzania, Mozambique

Further information: <http://beta.worldbank.org/climatechange>

Strengthening Local Agricultural Innovation Systems in Less Favourable and High-Potential Areas of Tanzania and Malawi

Purpose: In many sub-Saharan African countries, poverty is linked to low agricultural productivity, which climate change threatens to aggravate. This action-research project aims to bring together institutions and individuals from the research, policy making and farming communities to develop agricultural innovation systems that are better able to adapt to climate change and variability.

Period: 23/03/2007 to 23/03/2011

Current activities: They will do so with reference to case studies of farmers in two different agro-climatic sites - one disadvantaged and the other high-potential - in each of Malawi and Tanzania

Planned/future activities:

Donors and scale: Funded by IDRC the project covers Tanzania and Malawi (Institute of Resource Assessment)

Further information: www.idrc.ca

Support climate change activities linked with the NAPA process in Tanzania

Current activities:

1. General awareness rising on climate change and potential responses
2. Analysis of climate change trends and its impacts, and support to the prioritisation of actions in NAPA

Donors and scale: Danish Embassy. Tanzania,

Further information: <http://amg.um.dk/en/menu/PoliciesAndStrategies/Climate+and+Development>

University of Zimbabwe (Department of Geography and Environmental Science) Research

Current activities:

- Impact of Climate change and variability on agriculture and water resources
- Vulnerability and adaptive capacity assessment based on Geoinformation science and participatory techniques
- Remote sensing of carbon stocks and carbon sequestration potential

Donors and scale: SADC Region

Further information: www.uz.ac.zw/science/geography

Urban-Rural Interdependence and the Impact of Climate Change in Malawi and Tanzania

Purpose: A growing concern is how climate change and climate variability will affect the growing urban population and the food supply systems sustain it. This study will attempt to elucidate rural-urban interdependency in Malawi and Tanzania

Period: 13/07/2009 to 13/07/2012

Current activities: Documenting the vulnerabilities and coping strategies of communities and how these will be affected by climate change; and offer communities, local governments and those involved in food supply systems alternatives for adapting to climate change and climate variability

Donors and scale: Funded by IDRC the project covers Tanzania and Malawi (Institute of Resource Assessment).

Further information: www.idrc.ca/en/ev-113692-201_104150-1-IDRC_ADM_INFO.html

Vulnerability and Adaptation to Climate Change : Agricultural Systems in Madagascar

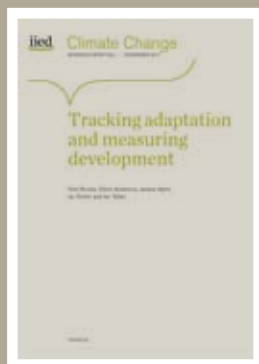
Period: 2007/06/11 to 2010/06/11

Current activities: This project will allow the University of Antananarivo to facilitate a dialogue between decision-makers and researchers at the national, regional and local level; to produce spatial information on the factors affecting vulnerability to climate change on the whole island of Madagascar; to better understand existing and possible adaptation strategies; to explore various intervention strategies under different scenarios; and to reinforce national capacity in analysis of climate change vulnerability and adaptation.

Donors and scale: Funded by IDRC and housed at the Université d'Antananarivo in Madagascar.

Further information: www.idrc.ca/en/ev-113691-201_104143-1-IDRC_ADM_INFO.html;
www.univ-antananarivo.mg

Other IIED publications



Tracking adaptation and measuring development

Nick Brooks, Simon Anderson, Jessica Ayers, Ian Burton, Ian Tellam

This is the first paper in the new IIED Climate Change Working Paper series.

As adaptation to climate change becomes the focus of increasing attention and the target of significant spending, there is a growing need for frameworks and tools that enable organisations to track and assess the outcomes of adaptation interventions. This paper presents a coherent framework for climate change adaptation programming, including potential indicators, or indicator categories/types, for tracking and evaluating the success of adaptation support and adaptation interventions.

2011, ISBN 978-1-84369-834-0

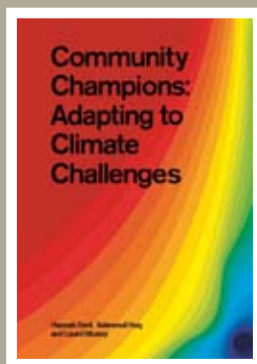
ISSN 2048-7851 (Print)

ISSN 2048-786X (Online)

34 pp.

Order no: 10031IIED

<http://pubs.iied.org/10031IIED.html>



Community Champions: Adapting to Climate Challenges

Edited by Hannah Reid, Saleemul Huq, Laurel Murray

This publication contains abstracts (mainly in English, some in French) from papers presented at the fourth International Conference on Community-Based Adaptation to Climate Change which was held on 21-27 February 2010 in Dar es Salaam, Tanzania. The Conference was structured around plenary and technical sessions on a variety of important subject areas such as agriculture, water resources, and ecosystems to cross-cutting issues of policy, funding, and strengthening institutions. Nearly a hundred projects were showcased and demonstrate the sheer variety and innovation of current community-based projects. The projects are a resource for information sharing and learning.

The publication is written in a very accessible style and contains many photographs.

2011, ISBN: 978-1-84369-799-2

105 pp.

Order No. : 10028IIED

<http://pubs.iied.org/10028IIED.html>



REDD+ in dryland forests: Issues and prospects for pro-poor REDD in the miombo woodlands of southern Africa

Ivan Bond, Muyeye Chambwera, Brian Jones, Isilda Ntantumbo and Monica Chundama

Implementing REDD+ programmes involves providing sufficient incentives to land users and requires a supportive policy, legal and institutional environment. Community-based natural resource management (CBNRM) in the miombo ecoregion of east and southern Africa has addressed these issues in its evolution. The Programme on Forests (PROFOR) supported a research project to address these and other issues. Country case studies from Zambia, Mozambique and Namibia were used to draw lessons from CBNRM that could inform pro-poor REDD as well as provide the likely opportunity costs of REDD+. The study draws on consultations and well-documented experiences of CBNRM.

IIED, 2010, Natural Resource Issues 21

ISBN 978-1-84369-764-0, ISSN

1605-1017

68 pp.

Order No. 17506IIED

<http://pubs.iied.org/17506IIED.html>



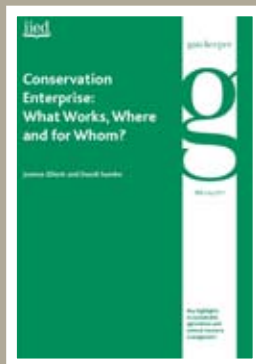
Community management of natural resources in Africa: Impacts, experiences and future directions

More than twenty years have passed since community-based natural resource management (CBNRM) rose to prominence in different parts of Africa as a strategy for rural development, local empowerment, and conservation. Led by new ideas about the merits of decentralized, collective resource governance regimes, and creative field experiments such as Zimbabwe's CAMPFIRE, these community-based approaches evolved in a wide range of ecological, political, and social contexts across Africa. This review provides an unprecedented pan-African synthesis of CBNRM, drawing on multiple authors and a wide range of documented experiences from southern, eastern, western and central Africa. The review discusses the degree to which CBNRM has met poverty alleviation, economic development and nature conservation objectives.

The report is published in English and French.

IIED, 2009, Natural Resource Issues 18
English: ISBN 978-1-84369-755-8, ISSN 1605-1017
154 pp.
Order No. 17503IIED
<http://pubs.iied.org/17503IIED.html>

French: ISBN 978-1-84369-757-2, ISSN 1605-1017
160 pp.
Order No. 17503FIIED
<http://pubs.iied.org/17503FIIED.html>



Conservation enterprise: What works, where and for whom?

Joanna Elliott and Daudi Sumba

Community-based natural resource management (CBNRM) recognises that local communities are often best placed to conserve natural resources, as long as they stand to gain more than they lose from doing so. Conservation enterprises - commercial activities generating economic and social benefits in ways that help meet conservation objectives - seek to reinforce these incentives.

The African Wildlife Foundation (AWF) has adopted conservation enterprise as a core part of its conservation strategy since the 1990s. It predominantly supports partnerships between local communities and the private sector, with the community retaining ownership and the private sector providing the management expertise and paying a combination of fixed and variable fees to the community for access to its resources.

This study draws on the experience of the AWF and other organisations to assess what effect conservation enterprises can have on the livelihoods of local communities and how effective such initiatives are at poverty reduction.

IIED, 2011, Gatekeeper 151
ISSN 1357 9258
24 pp.
Order No. 146131IIED
<http://pubs.iied.org/146131IIED.html>



Social assessment of conservation initiatives: A review of rapid methodologies

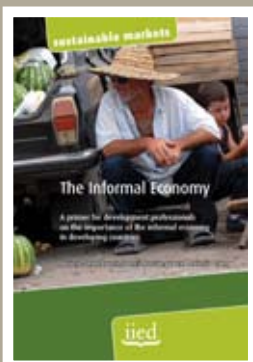
Kate Schreckenberg, Izabel Camargo, Katahdin Withnall, Colleen Corrigan, Phil Franks, Dilys Roe, Lea M. Scherl and Vanessa Richardson

Areas of land and sea are increasingly being marked out for protection in response to various demands: to tackle biodiversity loss, to prevent deforestation as a climate change mitigation strategy, and to restore declining fisheries. Amongst those promoting biodiversity conservation, the impacts of protected areas on resident or neighbouring communities have generated much debate, and this debate is raging further as new protection schemes emerge, such as REDD.

Some 30 tools and methods for assessing social impacts in protected areas and elsewhere are reviewed in this report, with a view to understanding how different researchers have tackled the various challenges associated with impact assessment.

IIED, 2010, Natural Resource Issues 22
ISBN 978-1-84369-769-5, ISSN 1605-1017
124 pp
Order No. 14589IIED
<http://pubs.iied.org/14589IIED.html>

Other IIED publications



The informal economy

Muyeye Chambwera, James MacGregor, Antonia Baker

Could the informal economy be the route to deliver the big sustainable development ideals, given that its share is rapidly increasing and that the poor mostly operate here? In some developing countries, the share of the informal economy is greater than that of the formal economy. Government planners, donors and NGOs could use the informal or the formal economy to help lift up the wellbeing of the poor and address global challenges such as climate change, but choosing one over the other could lead to most efforts missing the mark. In attempting to answer questions about whether or not the informal economy is an impediment to development, whether it should be eliminated or promoted, we realise that the informal economy is not fully understood, is not clearly separated from the formal economy, is difficult to measure and does not necessarily imply illegality. These are among the 10 key messages that this paper raises for development professionals operating in any sector, in developed and developing countries.

IIED, 2011 ISBN: 978-1-84369-822-7
16 pp
Order No. 15515IIED
<http://pubs.iied.org/15515IIED.html>

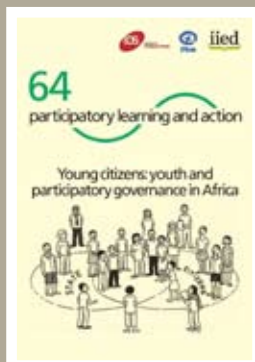


Community-driven disaster risk reduction and climate change adaptation in urban areas

Diane Archer, Somsook Boonyabancha, Norberto Carcellar, Jason Christopher Rayos Co, Zarina O Hipolito, Mark Pelling, Jorgelina Hardoy, Gustavo Pandiella, Luz Stella Velásquez Barrero, Cassidy Johnson, C Ramachandraiah, Joel F Audefroy, Caroline Moser, Alfredo St

The papers in this issue of *Environment and Urbanization* bring to our attention the importance of community action - for disaster risk reduction, for post-disaster rebuilding and for climate change adaptation. The paper by Diane Archer and Somsook Boonyabancha highlights the energy and creativity of disaster-affected communities as they rebuild their homes and livelihoods far more effectively and far more cheaply than external agencies. Other papers in this issue show the importance of community organisations in developing responses to disaster risk or in post-disaster rebuilding and in trying to get government support to do so.

Sage Publications, 2011, *Environment and Urbanization* Vol. 23, No. 2
ISSN 0956-2478, eISSN 1746-0301
636 pp.
Order No. 10605IIED
<http://pubs.iied.org/10605IIED.html>



Young citizens: youth and participatory governance in Africa

Guest-edited by Jessica Greenhalf and Rosemary McGee

All over the world citizens are starting to demand accountability from those in power. We are seeing exciting experiments in participatory governance. But are they working for young people? What spaces are most promising for the participation of children and young people in governance?

Across Africa youth (particularly boys and young men) are seen as a frustrated and excluded 'lost generation' who are marginalised from decision-making processes. Contributors to this special issue of *Participatory Learning and Action* demonstrate how this is changing. Young people in Africa are challenging the norms and structures that exclude them, engaging with the state and demanding accountability.

IIED, IDS and Plan UK, 2011
ISBN: 978-184369-829-6
230 pp.
French (online only) forthcoming, 2012
Order No. 14607IIED
<http://pubs.iied.org/14607IIED.html>