CHAPTER 8

Options for Africa

Credit: Christian Lambrechts

DRAFT 1

WORK IN PROGRESS
DO NOT QUOTE,
DO NOT CITE

CHAPTER 8: OPTIONS FOR AFRICA

MAIN MESSAGES

Messages for regional stakeholders

- Achieving the goals depends on addressing the underlying drivers many of which have a global dimension, including for example land investments for biofuels and carbon capture that reduce food security and livelihoods.
- Successful policy relies on recognizing the interlinked and mutually dependent nature of ecological and social systems, including human well-being-poverty-environment dimensions.
- Developing regional processes to building on knowledge and shared experience can improve learning and response to ongoing environmental change, as regional early warning and TBNRM show.
- Strengthening accountability to mandate and constituency by for example incorporating enforceable good governance rights and strengthening monitoring and reporting, can contribute to achieving the goals
- Cooperation across sectors, among different actors at national, regional and global levels (TBNRM, CBNRM, Inter-actor dialogues) can reduce conflict and contribute to social and ecological resilience
- The expansion and replication of PES could support social-ecological resilience, if a set of guiding principles are adopted and systems for monitoring and evaluating both social and environmental impact and institutional arrangements are made to ensure pro-poor benefits.
- Protecting, restoring and enhancement ecosystems, including forests, wetlands and mangroves, marine ecosystems makes good sense as this can contribute to improve human wellbeing, climate adaptation and mitigation, and be an effective strategy for disaster risk reduction by reducing vulnerability and exposure to hazards.
- Community based resource governance supports effective local management and improves outcomes for biodiversity and people by ensuring equitable sharing of biodiversity benefits especially among the marginalized.
- Transboundary conservation ensures ecological integration and encourages regional networking, emergence of shared values and reduces conflict.
- Recognizing the value of traditional indigenous knowledge, culture and values can enhance sustainable use of biodiversity.
- Public-private-partnerships hold potential for biodiversity conservation especially for biodiversity conservation, financing and rehabilitation of degraded biodiversity both within and outside protected areas.
- Ecosystem based management (EBM) is necessary in Africa when there is recognition that the challenges and threats must be addressed and managed at a regional scale in order to maintain the functions and resilience of ecosystems, including marine and coastal ecosystems.
- By virtue of their fluid nature (larval dispersal, connectivity, large scale species movement and migration) and transboundary threats exerted on them (coastal exploitation, high seas harvesting, and marine pollution), African marine systems require multiple scale management using a variety of policy strategies and tools.
- The most important and useful policy tools that have shown success in certain locations in Africa and can be replicated include developing individual and networks of Marine Protected Areas, managing coastal areas using a cross sectorial approach through Integrated Coastal Zone Management, addressing Marine Pollution through regional protocols and conventions, and harnessing innovative approaches for financing marine management through valuation and payments for ecosystem services.
- A lack of well-defined property rights leads to ecosystem conversion or degradation by special interests, especially commercial sectors in forests, fisheries, tourism, and agricultural sectors. Similarly resource alienation, as in land through PES disempowers vulnerable groups of society.
- A strong move towards local ownership and management of terrestrial and marine resources with

national and regional guidance and financial / technical support will reduce state obligations, reduce stakeholder conflict, and is clearly the best overall approach to successful environmental management in Africa.

- Better integration of environment-development-vulnerability is needed for nations to cope with and adapt to climate and other environmental change.
- Human rights approaches to water, land and biodiversity can strengthen outcomes for people and ecosystems
- Achieving policy goals in any one thematic area is closely linked to success in achieving goals in other thematic areas. For example, securing biodiversity is only possibly where sustainable management approaches are adopted for seas, water and land.

Messages for the international community

- International cooperation and partnerships (shared but differentiated responsibility, aid commitment) are crucial for strengthening national and regional capabilities to deal with environmental change and for improving human well-being.
- Establishing equity and fairness in (global) markets and trade (including of environmental services) is essential for reducing vulnerability and strengthening sustainable long-term perspectives in natural resource use.
- Establishing equity and fairness in global decision-making is a prerequisite for global policy development that takes account of regional interests and priorities.
- Policies in one region or country may adversely affect outcomes in another making it imperative to avoid policies that amount to an "Export of Vulnerability".

1. PRIORITY POLICY GOALS

The Africa regional consultation identified five international environmental goals in the thematic areas of climate change, land (soil, land use, land degradation and desertification), biodiversity, freshwater, and seas and oceans (Table 8.1). Achieving these goals can help Africa secure its natural wealth that underpins not only its development potential but also the well-being of its peoples and the maintenance of their cultural systems (Box 8.1).

Table 8.1 Agreed Policy Goals

	Policy	Key Issues
Climate Change	**UN Framework Convention on Climate Change, article 3, paragraphs 1-3** • Protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof. • The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration. • The Parties should take precautionary	This requires policies that are based on the sharing of responsibility among parties in support of adaptation and mitigation. The region needs to address the (1) increased incidences of extreme weather events; (2) growing vulnerability of riverine settlements to flooding and landslides; (3) high vulnerability of populations given dependence on natural resources – this includes reduced livelihood capacity as climate impacts food production and water availability, and threatens the social fabric of communities especially in the Savannah and Sahel; and (4) climate threats to biodiversity. The region needs to develop adaptation and mitigation strategies; strengthen capacity to predict the weather changes including extreme events; and find ways of limiting greenhouse gas emissions growth while continuing on a sustainable development path. Africa's weak policy context provides an insufficient basis for

	Policy	Key Issues
	measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.	effective response. Challenges include lack of a coherent policy on climate change; weak monitoring, evaluation and reporting systems; and lack of mitigation and adaptation strategies
Land	**Johannesburg Plan of Implementation Paragraph 40 b** Develop and implement integrated land management and water-use plans that are based on sustainable use of renewable resources and on integrated assessments of socio-economic and environmental potentials	This requires addressing the close relationship between water and land quality and availability. The multiple drivers of land degradation and loss of soil fertility need to be addressed, and these include (1) increased incidences in extreme events, such as flash floods and droughts, (2) inadequate communal and other land tenure systems, (3) population growth placing more pressure on natural resources (4) contamination of soil, groundwater and surface waters from industry, urbanisation and unsustainable farming practices; (5) poor farming methods; and (6) poor land use practices Africa's land policies need to respond to the risk of food and energy security, exacerbated by climate change.
Biodiversity	**Convention on Biological Diversity, article 10** • Adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biological diversity; • Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements; • Support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced; and • Encourage cooperation between its governmental authorities and its private sector in developing methods for sustainable use of biological resources.	This requires an approach that (1) addresses the interface between social systems and biodiversity conservation, and places sustainable use at the centre of the response; and (2) recognizes that conserving biodiversity requires strategies that include all those who rely on and impact on biodiversity directly, including indigenous people, local communities and the private sector. An effective response must address drivers of loss of biodiversity (both terrestrial and marine) from invasive alien species; destruction of habitats including land clearance; poaching and overexploitation; unsustainable management; and climate change.
Freshwater	**Johannesburg Plan of Implementation Paragraph 26 c** Improve the efficient use of water resources and promote their allocation among competing uses in a way that gives priority to the satisfaction of basic human needs and balances the requirement of preserving or restoring ecosystems and their functions, in particular in fragile environments, with human domestic, industrial and agriculture needs, including safeguarding drinking water quality	Developing a strategy to deal with water scarcity calls for better demand management and more equitable access regimes. There needs to be a shift away from seeing water as simply providing goods and services for human population to understanding its role in maintaining the integrity and resilience of ecosystems. Strengthening institutional and legal frameworks for the management of transboundary water resources is essential. Pressures and drivers must be addressed, and this includes growing demand from urbanization, expanding population, and economic growth; pollution; and climate change.
Seas and Oceans	**The Jakarta Mandate of the Convention on Biological Diversity** Promote the conservation and sustainable use of coastal and marine ecosystems as well as their natural resources	Effective response requires addressing (1) the overexploitation of marine, ocean and coastal resources, including fisheries; (2) ocean acidification; (3) marine pollution; and (4) the impact of urban development in coastal areas. This calls for an ecosystem-level approach that embraces diverse, innovative and effective policies. These include a comprehensive network of marine protected areas (MPAs) representative of the richness and diversity of these areas; integrating management of the land and sea and specifically focusing on the interface; financially valuing marine ecosystem services, and; addressing marine waste and pollution.

Box 8.1 Africa's environmental wealth

Africa is bound in the north by the Mediterranean Sea, the Atlantic Ocean to the west, the Indian Ocean towards the central and southeast, and the Red Sea to the northeast, connecting to the Mediterranean via the Suez Canal (Brown et al., 2009).

The region is endowed with a large variety of coastal ecosystems such as estuaries, coral reefs, mangrove forests, wetlands and dunes, which provide critical services to coastal communities and to national economies. Terrestrial biodiversity systems are diverse and range from tropical to dryland systems. The high marine and terrestrial species diversity and endemism of Africa's ecosystems provide a strong motivation to develop comprehensive plans for the management of these resources, as envisioned in Article 10 and The Jakarta Mandate of the Convention on Biological Diversity.

Maps: A Mosaic of Wealth: (a) plant species richness (b) Mammalian Species Richness (c) coastal and marine resources (d) River Basins (e) Forests, vegetation cover and agriculture

Although amongst the driest continents, Africa is home to some large perennial rivers, including the Congo, Nile, Niger and the Zambezi. Africa's freshwater resources are found in over 80 transboundary basins – some shared by as many as ten countries. These hold tremendous potential for hydropower generation, multi-country irrigation schemes, inter and intra-country navigation, joint inland fisheries development, joint water supply, environmental protection, wild life conservation, recreation and eco-tourism (UNECA 2000; Pietersen and Beekman 2006).

Land resources covering 30 million square kilometres of forests, woodlands, grasslands, wetlands, coastal zones, and mountain and urban areas (UNEP 2007), of this 8.7 million square kilometres is suitable for agriculture (FAO 2001) and has the potential to support the majority of the country's one billion people (UN-HABITAT 2010).

2. ASSESSMENT OF PRIORITY POLICY OPTIONS

This section presents ***thirteen*** policy clusters that appear to be successful in realizing the identified goals for Africa.

The selected policies have a mix of potential impacts, with some focusing on fixing an immediate problem, while others are aimed at fundamental changes in values and mindsets and are transformative in this sense (Meadows 1999). The policy interventions do not exist in isolation and attributing positive outcomes to any one is problematic as other factors contribute to success. In addition weak systems for monitoring and tracking results in social, environmental, economic and political domains mean that the appraisal relies on qualitative analysis from peer-reviewed literature and documented project experience.

In order to offer the broadest range of policies possible (and avoid repetition), the selected policies are not presented by theme. As Table 8.2 shows the selected policy options are relevant to achieving the goals across different thematic areas, although a few are thematically specific.

1 **Table 8.2: Policy options support the realization of goals across thematic areas**
2

POLICIES	POLICY THEME & GOALS (and key aspects)				
	BIO-DIVERSITY	**FRESH-WATER**	**LAND**	**OCEAN AND SEAS**	**CLIMATE CHANGE**
	CBD Article 10. Sustainable Use	**Johannesburg Plan of Implementation. Para26c.**	**Johannesburg Plan of Implementation . Para 40(b)**	**Jakarta Mandate of the CBD**	**UNFCCC paragraphs 1-3.**
TRANSBOUNDARY NATURAL RESOURCE MANAGEMENT	Encourages pooling of management and resources. Harmonized approaches consequently reducing adverse impacts on biodiversity	Manages demand. Encourages equitable sharing of ground and surface water and reducing conflict. Facilitates learning among diverse actors about best conservation practices	Opportunity for integrated water and land use that is ecosystem focused	Harmonizes use regimes and encourages sustainable use through joint monitoring	Contribute to effective land/sea approaches that enhance ecosystems and create new mitigation opportunities (carbon in wetlands) and increases resources for adaptation
MARINE PROTECTED AREAS	Reduces adverse impacts on biodiversity			Sets aside areas for conservation and for breeding	Secures fundamental ecosystem services and goods for adaptation and mitigation
PAYMENT FOR ECOSYSTEM SERVICES	Improves opportunity for local benefits, while strengthening conservation perspectives	Encourages better valuation of water resources such as wetlands	Effective for realizing social, ecological & economic benefits and can shift focus to "conservation" or alternative land use.	Encourages sustainable use.	Restoration/ conservation of carbon sinks (wetlands, forests, soils) Adaptation and Disaster Risk Reduction through coastal zone protection
REDD	Creates co-benefits for biodiversity & people		Provides alternative land use that focus on delivery of multiple benefits	Approach can be extended to Mangrove forests and sea grass beds	Mitigation. Adaptation by increasing earnings & securing biodiversity. Shared Responsibility
INTEGRATED SOCIAL & ECOLOGICAL SYSTEM MANAGEMENT	Encourages recognition of multiple values potentially encouraging positive impacts on biodiversity	Integrated Water Resources Management that takes account of socio-economic and environmental considerations and source to sea approach	Integrated water-land approaches	Sustainable ecosystem-based fisheries	Enhances adaptive capacity by increasing multiple benefits (finance/ ecosystem services)
SUSTAINABLE LAND MANAGEMENT	Establish sustainable use outside of protected areas, improving opportunities for biodiversity	Protects water sources and maintains water quality. Helps address urban flooding	Integrated water-land approaches ensures that perverse incentives are not adopted	Reduced agricultural pollutants. Opportunity to manage impacts/ intersections with agriculture/water. Reduces adverse impacts on interface between land and oceans (mangroves, coastal flats)	Conservation Agriculture benefits adaptation

POLICIES	POLICY THEME & GOALS (and key aspects)				
	BIO-DIVERSITY	**FRESH-WATER**	**LAND**	**OCEAN AND SEAS**	**CLIMATE CHANGE**
	CBD Article 10. Sustainable Use	**Johannesburg Plan of Implementation. Para26c.**	**Johannesburg Plan of Implementation . Para 40(b)**	**Jakarta Mandate of the CBD**	**UNFCCC paragraphs 1-3.**
INCLUSIVE & PARTICIPATORY APPROACHES INCLUDING INDIGENOUS USE	Supports cultural use. Draws on local knowledge to address degradation. Protects social interests and encourages long term use perspectives, reducing adverse impacts on biodiversity	Promotes fair equitable sharing and use.	Supports cultural use. Draws on local knowledge to address degradation. Protects social interests and encourages long-term use perspectives. Encourages alternative land-use	Supports cultural use. Draws on local knowledge to address degradation. Protects social interests and encourages long-term use perspectives.	Enhances local resilience and contributes to adaptation by drawing on local knowledge and empowering local people
HUMAN RIGHTS	As Above. Creates opportunity for resource custodians to address poverty-ecosystem relations	Ensures basic water needs. Fairer distributive mechanism	Land tenure encourages long-term use perspectives. Reduces opportunity for land grabs and resource alienation	Gives citizens an opportunity to bring action against marine polluters.	Enhances local resilience and contributes to adaptation. Provides a secure basis for credit investment in adaptation
COMMU-NITY ADAPTA TION	Local investment in ecosystem management contributes to biodiversity and social benefits	Water-harvesting techniques. Improves supply	Strengthens links between local and indigenous knowledge systems and state-management systems	Contributes to mangrove and reef protection	Improves access to scarce water resources – Adaptation
COASTAL & MARINE PROTEC TION	Restores biodiversity in mangroves and breeding sites. Strengthens social resilience	Reduces salt water intrusion	Reduces salinisation	Restores biodiversity in mangroves and breeding sites.	Secures settlements – adaptation. Disaster Risk Reduction
ECONOMIC POLLUTION INSTRUMENTS		Protects water sources. Encourages better valuation of resources.			
MARINE POLLUTION MANAGE-MENT	Secures ecosystems for biodiversity conservation			Essential for conservation and maintaining socio-eco benefits	Improves access to livelihood resources that support adaptation
WATER TOWERS	Increases water for ecosystems and biodiversity	Improves Supply	Enhances land productivity		Improves supply through improved conservation - adaptation

The identified policies goals are interlinked

First, achieving the goal in any one area is closely linked to success in achieving the goal in the other thematic areas. For example, securing biodiversity is only possibly where sustainable management approaches are adopted for seas, water and land.

Second, achieving the goals relies on successfully addressing a common set of drivers that lie at the heart of environmental problems. Many of these drivers lie outside the region. This reality means that global cooperation is critical in addressing environmental problems – practically and ethically. For example, changing consumption patterns of food and energy use including the demand for biofuels often adversely impacts on land resources (Cotula et al. 2008). Global land deals in Africa continue to grow exponentially. In 2009, the World Bank found that deals for some 45 million hectares of land were agreed globally, 70 per cent were in Africa (World Bank 2009). Recent research shows that 79.9 million hectares, 50.7 million of which is in Africa, was subject to global land deals between 2001-2011 (Oxfam, CIRAD, CDE and ILC 2011). When the benefits of land use change are externalized adverse impacts on livelihoods and human wellbeing occur potentially affecting the achievement of the MDG's food security and poverty goals[1].

Evidence suggests that the four expected benefits of land investments – more jobs, new technology, better infrastructure and extra tax revenues –have not been realized (Hilhorst 2011, Locher 2011, Fairbain 2011, Da Via 2011). Both climate change mitigation policies and waste management (chemical and technological) are important dimensions of a policy-practice complex that "exports vulnerability" (Jaeger et al., 2007). These global practices have gendered impacts placing added stress in social-ecological resilience (Daley and Mokoro 2011; Behran et al., 2011, Jaeger et al., 2007).

Urbanization is quickly changing cities and rural areas. In 2010 over a third of Africa's 1 billion inhabitants lived in urban areas, but by 2030 that proportion will have risen to a half (UN-Habitat 2010). The population of some cities will grow more rapidly, expanding by up to 85% in the next 15 years (UN-Habitat 2010). Without effective urban planning, ecosystem restoration and boosting human wellbeing many cities will become havens of vulnerability. Growing population in coastal areas, growing demand for fish, and the availability of new fishing technology has driven widespread overfishing and degradation of supporting ecosystems and added pressure on the fragile cost line of urban cities. Some 20 coastal cities are likely to face coastal flooding (UN-Habitat 2010)

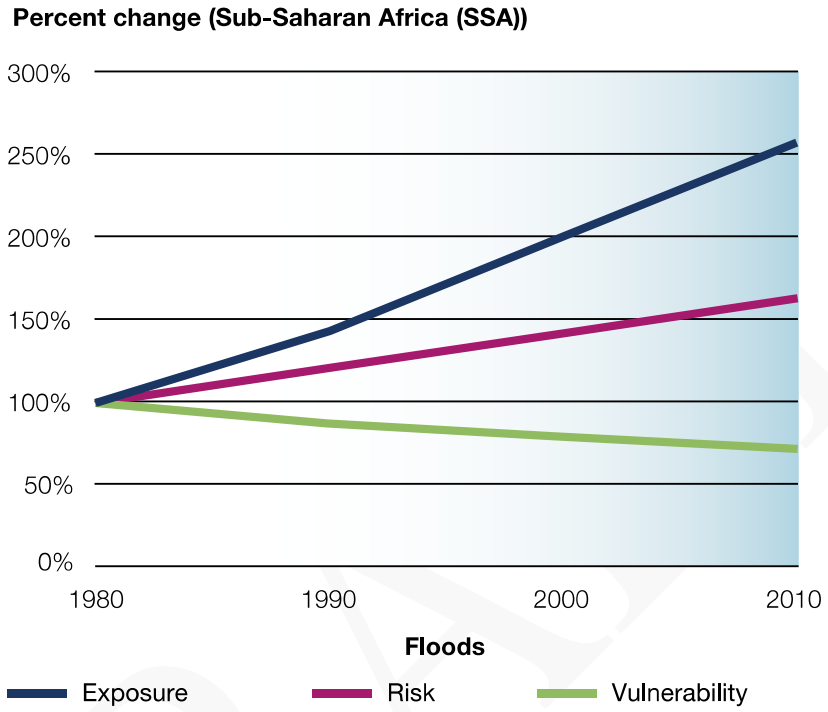
Third, the potential to achieve the ecological sustainability and resilience aspects of the goals is intricately inter-twined with the state of human wellbeing, vulnerability and resilience. Human wellbeing refers to having the freedom and choice of action; four key constituents underpin this – security, materials for life, good social relation and health (MA 2003). When wellbeing is low, adverse environmental impacts may be significant. For example, the lack of well-defined property rights may lead to ecosystem conversion or degradation by special interests, especially by the commercial sectors in forests, fisheries, tourism, and agricultural sectors. Another major driver for ecosystem degradation is the fact that, due to social barriers, women have had limited authority in making decisions related to ecosystem use. The exclusion of women—the primary users and custodians of the land—has inevitably transferred land use decisions to stakeholders who have very little knowledge or interest in the sustainable use of land (UNDP PEI).

Fourth, the social dimensions of the goals – and indeed Africa's development goals –are underpinned by securing resilient ecosystems and achieving sustainable management (MA 2003, Jaeger et al., 2007). Both slow onset environmental change and increased incidence of extreme weather events is threatening human wellbeing and vulnerability resulting in a loss of life, livelihoods and economic assets. The UN-ISDR Global Assessment of Risk for example found that in sub-Saharan Africa, the number of people exposed to floods in the region grew from 500,000 per year in 1970 to almost 2 million people per year in 2010 (ISDR 2011; Figure 8.1). Given low levels of development and weak

[1] A figure on progress in achieving Africa's Food Security and Poverty Goals will be made available in Draft 2.

governance both the loss of life and livelihoods continues, in contrast to global trends, continues to be high. Exposure to floods however is related not only to these changing climatic context but to environmental choices, including the failure to fully implemented IWRM approaches including in cities.

Figure 8.1: Vulnerability in Africa
a) Percentage change in flood mortality risk, exposure and vulnerability from 1980-2010 (baseline 1980)



Healthy ecosystems increase resilience by strengthening livelihoods and increasing the availability and quality of environmental goods and resources (Jaeger and other 2007, MA 2003). In addition they are invaluable resources for climate adaptation and reducing vulnerability to the growing incidence of natural hazards, as they serve as natural protective barriers and buffers against many physical hazards. Although their value is difficult to measure in economic terms, estimates indicate that regulatory services that mitigate hazards may form the largest proportion of the total economic value of ecosystem services (ISDR 2011). For example, in the United States of America, coastal wetlands absorb wave energy and act as 'horizontal levees', providing US$23.2 billion per year in protection from storms (ISDR 2011)

Fifth, weak governance continues to generate conditions – conflict, poor accountability among others – that undermine successful environmental management and exacerbate human vulnerability. UNDP-PEI experience in Mauritiana shows, for example, that political and related instability makes it very difficult to achieve environmental mainstreaming (PEI). Globally the risk of dying as a result of an extreme hazardous event has decreased except in countries with low GDP and weak governance (ISDR 2011). In general extreme weather is increasing economic loss risk and this is attributed to the difficulty in reducing vulnerability and failing to address governance issues that underlie "resilience traps," where disaster losses and impacts cause negative feedbacks into slow development and structural poverty.

Policy Option 1: Transboundary Conservation

Ecosystems and river basins are not constrained by national boundaries. Similarly (marine and terrestrial) ecosystems and fauna and flora richness are distributed across boundaries (Scholes et al., 2006, Arthurton and 2006). Transboundary resource management help establish shared values to shared biodiversity and water resources. These approaches can discourage loss, support integrated land and water management, and contribute to fairer and more equitable sharing of both ground and surface water.

Africa has multiple transboundary conservation initiatives, some of which include social and development dimensions. These include transboundary conservation areas in Southern Africa (Figure 8.2), the W-Arly-Pendjari region (Burkina Faso/ Benin, Niger), the Greater Virunga Landscape and the Mount Elgon Regional Conservation Programme; basin agreements including Nile Basin Initiative and the Orange-Senqu Commission; marine transboundary conservation (including the Agulhas and Somalia Large Marine Ecosystems projects, and the Benguela Current Large Marine Ecosystem Programme in West Africa). Not all transbounday conservation focuses on defined territory; an example of non-territorial approaches includes IUCN's lion conservation strategy

Figure 8.2: Transboundary Protected Areas in southern Africa

In the biodiversity sector, transboundary conservation reinforces an ecosystem approach. A SADC wide review notes that these areas can support the development of more integrated planning and managerial frameworks that cut across boundaries (Mohamed-Katerere 2001). They have also had success in safeguarding the international biodiversity hotspots such as the Maputaland-Pondoland-Albany Hotspot – the second richest floristic region in Africa (after the Cape Floristic Region) –which spans an area of nearly 275,000 km² and includes portions of South Africa, Swaziland and Mozambique (reference). Importantly transboundary conservation can enhance regional cohesion and reduce conflict by creating forums for dialogue, learning and knowledge sharing (Conca and Dabelko 2002, Hamill 2005)[2]. Improved earnings from tourism are of importance for development and human wellbeing.

[2] Additional information on conflict trends for Africa will be made available in Draft 2.

Transboundary natural resource management creates an opportunity for developing integrated landscape approaches (Katerere, Moyo and Jones 2001). This can have the benefit of bringing conservation areas into development frameworks and encourage alternative land-use (De Vries et al., 2007).

Transboundary collaboration is an inherently complex process, involving many actors, issues and agendas, and it is not surprising that achieving consensus can be challenging (Ervin et al., 2010; Box 8.2). Often conservation goals and objectives are different across different countries. For example the neighbouring countries of Kenya and Tanzania that share migratory wildlife have conflicting approaches: in Kenya a non-consumptive wildlife policy prevails, whereas Tanzania allows both non-consumptive use and sport hunting. Harmonizing law and policy is a prerequisite for the success of these areas. It is important to agree to a set of principles for sharing of costs and benefits and to management values, approaches and targets (Mohamed-Katerere 2001; Box 8.2). Another important drawback is that without sufficient safeguards upscaling management and rights can marginalize local users from decision-making and access to valuable livelihood resources (Jaeger et al., 2007, Whande 2010)

Box 8.2: Collaborative Water Management: *Organisation pour la Mise en Valeur du FleuveS´en´egal* (OMVS)

The 1 800 km Senegal River is shared by Guinea, Mali, Mauritania, and Senegal. The Organization for the Development of the Senegal River Basin came into being in 1974 to manage the international river (Varis, *et al.* 2006). The OMVS provides for the management of the Senegal River as a shared basin; acknowledges the role of the river in irrigation, navigation, and energy; and assigns water requirements to the riparian states not according to volume demand but to use demand. The OMVS was established as a supra-national authority to decide water allocation and dam management principles within the river basin.

The objectives of the OMVS first management plan were to (1) promote inter-country co-operation; coordinate knowledge development and management (navigation, irrigation, hydropower generation, environmental protection and conservation); and (3) regulate river flow for irrigation, flood control, power generation and other purposes. In 2002, a legal and regulatory framework, The Senegal River Water Charter, was adopted. The framework highlights a collaborative management approach and establishes principles of sharing the river basin's water among the different user groups based on optimal satisfaction of users' requirements instead of withdrawals (UN/WWAP, 2003).

The OMVS has had important achievements. These include improved flow regulation via the construction of a storage reservoir at Manantali in the upper reaches of the Senegal River; irrigation of some 375,000 ha in Senegal, Mali and Mauritania; the delivery of 200 MW of electricity to Mali, Senegal and Mauritania (Madamombe 2005); year-round navigation in the river from Kayes to Saint-Louis (900 km); construction of a salt water prevention barrage (Diama dam) near the estuary; flood control for downstream communities; and supporting farmers practising flood recessive agriculture around the Diama dam.

The value of OMVS can be seen in (1) improved political cooperation on river basin management and reduced conflict; (2) increased investment in basin resource management; (3) more resources channelled for socio-economic development (4) increased awareness; (5) development of a governance structure for basin development (6) strengthened regional cooperation for development by taking into account country needs. Through the OMVS Mali gained navigable access to ocean and energy production; Mauritania – power generation and irrigation; and Senegal – power generation, irrigation and improved lives of local populations

Despite this success, OMVS has several drawbacks (Varis*et al.* 2008). The complicated institutional set-up tackling regulation and development issues, has not always been able to deal effectively with conflicts. The Senegalese State Development Corporation, *Sociétéd'Exploitation des Terres du Delta Fleuved'Sénégal (*SAED) as a national body has been involved in large –scale rice agriculture in the Senegal delta while OMVS, operating on a transboundary level supports all stakeholders through small –scale recessive flooding farming. This demonstrates the need for better synchronization of development goals across levels.

The rapid replication of transboundary conservation areas demonstrates that this policy, despite some drawbacks, has high potential for replication.[3] Developing transboundary conservation is ideal for multi-diverse transboundary ecosystems such as Lake Victoria, the Nile basin, the Mara-Serengeti and the Tsavo-Mkomazi wildlife areas in East Africa.

Policy Option 2: Marine Protected Areas

World-wide, the establishment of marine protected areas (MPAs) is increasingly being viewed as a critical step in the conservation and management of marine ecosystems. Many countries committed to increasing the area of marine protection within their jurisdictions through various treaties. At the 2003 5th World Parks Congress, for example, 3 000 representatives from 144 countries committed to protect 10 – 20 per cent of their marine areas by 2025 (IUCN 2003).

The objectives of MPA establishment often complement a broad range of other national development and economic goals beyond environmental protection. Enhanced food security, decreased poverty, improved governance, increased value added in international trade, and sustained economic growth can be regarded as socio-political goals consistent with the more traditional environmental agenda of biodiversity conservation in MPAs. The MPAs also work hand-in hand with other regulatory policies such as fishery management tools. The five-year rotational harvesting in MPAs off the coast of Kwazulu-Natal in South Africa has been found to lead to the rapid recovery of the population of oyster during fallow years (de Bruyn et al., 2009).

Box 8.3: Africa's MPAs

West Africa has the widest network of Marine Protected Areas (MPAs) in Africa stretching over 23 sites in six countries, namely Mauritania, Senegal, The Gambia, Guinea Bissau, Guinea and Cape Verde (http://www.rampao.org/en/index.php). The secretariat for the MPAs is the Regional Network of MPAs in West Africa (RAMPAO). The West Africa marine ecosystem, which includes offshore upwelling areas, shallow banks and near-shore estuaries, is highly productive. The sub-region's coastal and marine systems have been compromised in recent years due to use and poor regulation in fisheries, tourism and development of oil and gas. The RAMPAO seeks to address common problems to the sub-region concerning migratory species and shared resources (Karibuhoye and Ducrocq 2008).

However the establishment of MPAs in Africa face multiple challenges (Box 8.4, Box 8.5). Disparities in governance, institutional structures, wealth distribution, social capital, and availability of ecological data effect the establishment and effectiveness of MPAs (Abdulla et al., 2008; Abdulla et al., 2009; Abdulla et al., Submitted). For example, few MPAs exist on the long coast of North Africa and none are currently located in the Tunisian eco-region of the Mediterranean coast (Abdulla et al., 2008).

[3] An additional graph showing increase in TCA will be made available in Draft 2.

Box 8.4: South East Marine Protected Area, Rodrigues

To address marine degradation and preserve marine biodiversity in Rodrigues island, the establishment of the UNDP/GEF South East Marine Protected Area (SEMPA), over an area of 43.7 km², was initiated in 2005. It comprises 12 km of fringing reef sheltering a large shallow lagoon that is home to more than 100 species of fish, coral, turtles, molluscs, octopus and crustaceans, and some unique species such as the coral called *Acropora rodriguensis*. The active participation and involvement of the local community in the initiation, development and now in the daily management and monitoring activities has contributed much to the success of the pilot project. The adoption of the co-management principles whereby all stakeholders – Rodrigues Regional Assembly, the local community, UNDP and GEF- participate in the decision making process has helped to develop a sense of belonging and ownership. The first marine rangers of the Republic of Mauritius were recruited in February 2010 from the local fishing community as well as a new batch of Community Resource Observers from the local coastal communities.

In some cases, MPAs suffer opposition from some sectors of society, mainly local fishers who may be excluded from their previous fishing zones (Apostolaki et al., 2002). The establishment of MPAs in Kenya at Mombasa, Kisite/Mpunguti, Malindi/Watamu, Kinge and Diani was resisted by tourism operators who could not afford licensing fees, protective clothing, and insurance and equipment safety required by new regulations (Weru 2004).

Many countries cannot afford comprehensive research on all marine habitats and species within their national jurisdiction. A different approach may be required under these circumstances, whereby the information required for the design and designation of MPAs arises through rigorous quantitative research in a few representative sites combined with comprehensive surveys of traditional knowledge (Johannes 1998). In the absence of scientific data it is not an excuse to postpone conservation and protection (no-take zones in MPAs) or management (multiple-use zones in MPAs) of marine resources.

Once designated, most MPAs face a lack of adequate resources for proper enforcement of regulations. However, innovative examples of alternative mechanisms for enforcement exist. For example, in Tanzania's Mafia Island Marine Park the local community is engaged in conserving their marine resources and promoting self-enforcement. In addition to raising awareness on the impacts of destructive fishing activities, the park has also helped its 11 villages to establish their own enforcement units, which operate at much lower costs than centralised ranger units. This strategy has had some success as local teams have reported a series of illegal incidents, showing that local communities can participate in management and shoulder the responsibility of surveillance (Andrews 1998, See also Box 8.4). However, regulation of activities within MPAs may lead to a displacement of exploitation effort to outside the MPA, in particular, in the high seas areas lying outside national and legal jurisdiction. MPAs may also be designed smaller than the desired optimal size and wider apart than is ecologically viable to maintain larval and adult connectivity (Abdulla et al., 2009). This is compounded by the fact that some MPAs may cross territorial waters, exclusive economic zones, and continental shelf boundaries, and fall into areas under the jurisdiction of different marine conventions, regional fishery management organizations or regional fishery agreements.

There is a pressing need for replication and extension of existing MPAs. Establishing a MPA network is a step beyond the more traditional approach of establishing MPAs opportunistically as single independent entities. Networks allow a whole that is greater than the sum of the parts. Through interconnections and interdependencies, the individual elements of the network contribute positively to each other's integrity by decreasing overall vulnerability. Marine food webs extend beyond individual MPA boundaries and fishers are dependent on different species and geographic regions at different times of the year. Tourism revenues from one easily accessible MPA with charismatic species can help subsidize the maintenance costs of another more remote MPA that does not have other values easily captured through current market mechanisms. Many biophysical and socioeconomic connections overlap national boundaries and regional cooperation can promote national interests.

Currently unprotected areas merit special attention within the larger MPA framework (Abdulla et al.,. 2009). Africa's long coastline stretching for 45, 649 km (Vafeidis et al., 2008) covers 33 countries of the region's 47 mainland countries, as well as six island nations (Brown et al., 2009). Given that three quarters of African countries are coastal, the scale of necessary marine governance becomes apparent. As part of a regional marine conservation agenda the formation of a set of MPA networks in those sub-regions where MPA coverage is minimal, including North Africa (Mediterranean Sea), Northeast Africa (the Red Sea), and Southern Africa is urgently needed.

The current portfolio of MPA highlights the need for implementation networks designed on the basis of coherent ecological criteria. To employ best practice principles of design and achieve viable MPA networks in under-protected marine areas of Africa, action at different nested scales is necessary. First, systematic surveys of marine biodiversity in key sites will be required to identify understudied regions (e.g., south Mediterranean, Western Red Sea) and biomes (e.g., the open ocean and the deep sea), and to establish biodiversity research priorities. Once these sub-regions have been identified and described with respect to biodiversity, ecosystem functioning, and existing threats, an integrated network of African marine protected area sites can be designed within each sub-region much like the West African network of MPAs (Karibuhoye and Ducrocq 2008). Once these key sites have been identified, effective conservation will require choosing appropriate MPA tools to address specific or local threats, and developing management plans in conjunction with local resource users and conservationists. This approach will ensure that protection is afforded to underrepresented species and habitats within biogeographically and oceanographically distinct regions of the continent, and will result in greater balance between affluent and non-affluent countries.

Policy Option 3: Payments for Environmental Services

Innovative mechanisms such as Payments for Ecosystem Services (PES) can play a critical role in achieving the identified goals by compensating and rewarding environmental custodians and other users for maintaining or restoring valued environmental services (Swallow et al., 2009, Wendland et al., 2009). PES seeks to modify incentives such that protecting and conserving resources can also be a rewarding financial option. Unlike other forms of upfront resource management financing, payment/financial support is designed to be conditional on delivery of conservation outcomes (Lau et al., 2010), making effective monitoring and evaluation a critical aspect of success.

PES has been used in biodiversity conservation and restoration in Kenya, Tanzania Uganda, Madagascar and Guinea; biodiversity offsets; the carbon market; eco-labelling; and community tourism (Swallow et al., 2009, Ochieng et al., 2007, Katoomba Group 2006, Muramira 2005, and Mwangi and Mutunga 2005).

Biodiversity offsets minimize and mitigate the impacts of development, in both terrestrial and coastal settings (Box 8.5). They can help address problems of land and ecosystem degradation, as well as protect fragile and valued habitats including forests, mangroves, coral reefs and seagrass beds. Maintaining these ecosystems can help mitigate the impacts of climate change.

Africa still lags behind other parts of the world in terms of developing PES approaches (Dillaha et al., 2011). For example, in the global carbon offset market for 2003 and 2004, Latin America and Asia accounted for more than three-quarters of the emissions reduction projects, while Africa accounted for just 3 per cent (Dillaha et al., 2011). Most biodiversity offsets are supplied by large landowners or firms that have the skills and financing to establish marketable habitat banks (Box 8.5), even though low-income communities could be competitive suppliers of biodiversity compensation areas or reserves in which the management focus is on conserving the existing resources (Milder et al., 2010).

Box 8.5: The Ambatovy Project in Madagascar: A Business and Biodiversity Offsets Programme (BBOP) initiative

Biodiversity offsets were included as a formal policy commitment and as priority projects and activities in the Madagascar Action Plan 2007-2012, following interactions between Government, environmental NGOs and the BBOP Secretariat, This plan sets out to "develop a policy for mining and logging companies for biodiversity offsets and other mechanisms and incentives for environmental protection" (MAP 2006).

Biodiversity offsets are defined as "measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development, and persisting after appropriate prevention and mitigation have been taken" (BDOP). The goal of biodiversity offsets projects is to achieve no net loss and preferably a net gain of biodiversity with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity.

The ongoing Ambatovy Mining Project is in the construction phase of an 18 km² open pit nickel and copper mine with an accompanying slurry pipeline and a U$ 2.3bn hydrometallurgical plant (ICMM 2010). In its effort to achieve outstanding environmental and social performance, the project initiated its offset programme in 2004 and in 2005 became a BBOP pilot project. The project's offset vision and design approach were elaborated alongside and according to the BBOP principles (especially the mitigation hierarchy) on biodiversity offsets (Ambatovy Project 2009).

The project's aim is to achieve measurable conservation outcomes with no net loss to biodiversity and actual net gain through a multifaceted conservation program, including an offsite offset spanning 11 600 ha of endangered forest; on-site (mine) conservation zones spanning 4 900 ha (including two areas of sacrificed ore bodies); a forest corridor ensuring connectivity with remaining eastern rainforests; support to conservation of a RAMSAR wetland adjacent to the mine site; and expanded reforestation activities along pipeline right-of-way and within mine footprint.

Identified enabling conditions in the Ambatovy project include financial and technical capacity. However these might not be affordable to smaller-scale offset projects. An extensive process involving public information, consultation and inquiry was, initiated and pursued since 2006. This process led to the integration of the programme into national, regional and local plans and most importantly, to agreements with the local communities to not expand agricultural and other previous environmentally-degrading activities. The company financially compensates for forgone economic opportunities associated with the offset activities. Despite such agreements, infringement on mining site is occurring, demonstrating the difficulty in achieving social equitability and sustainability. Other barriers to success relate to the physical and social environment. Extensive biological exploration has revealed that the geological and biodiversity complexity, diversity and wealth within the mine area, are difficult to find elsewhere, creating a considerable challenge in identifying like-for-like offset sites.

Importantly, the offset programme has led to significant capacity building in Madagascar, both internally and externally to the project's team. Such capacity provides potential for successful replication of strong capacity-building in-country and within the region for effective biodiversity offsets.

Sources: ICMM 2010, Ambatovy Project 2009, Republic of Madagascar 2006

Many PES experiences demonstrate benefits for nature and people (Box 8.5 and Box 8.6). For example, landowners in the Kitengela wildlife dispersal area adjacent to Kenya's Nairobi National Park have agreed to payments of $400-800/year in return for maintaining a wildlife corridor. These owners have agreed to not fence, quarry, cultivate, or subdivide the designated area of land and to sustainably manage livestock grazing (Swallow et al., 2009). Where designed to be "pro-poor" they can contribute to improving livelihoods and adaptation (Milder et al., 2010, Landell-Mills and Porras 2002, Food and Agriculture Organization 2007, Peskett et al., 2008). Mangrove carbon credits in West and East Africa, for example, have supported coastal regeneration and this contributes to adaptation and disaster risk reduction (reference).

Box 8.6: Private Protected Areas. The Chumbe Island Coral Park

In Africa, PES and PES-like mechanisms for marine and coastal protection are few compared to other regions of the world. However, one noted example is the private, non-profit Chumbe Island Coral Park Ltd (CHICOP) in Tanzania (Riedmiller 2000).

The Government of United Republic of Tanzania established a protected area around the island and its fringing coral reef in 1994 and gave the management rights to CHICOP, which was renewed in 2004. Under this agreement, CHICOP is responsible for developing and implementing a management plan "to manage, for conservation purposes, the Chumbe Island Reef Sanctuary and the Chumbe Island Closed Forest Habitat [that] includes educational and commercial activities related to the non-consumptive use of the above mentioned natural resources" (CHICOP Management Plans 1995-2016). Opened commercially in 1998, the full costs of operations of the park have been covered since 2000 by revenue generated through ecotourism via an eco-lodge, visitor centre and nature trails. Not only is the park financially sustainable, it has been successful in delivering key conservation outcomes (including the protection of surrounding coral reefs and associated species and increased fish stock in neighbouring fishing areas) as well as social outcomes (e.g. support by and employment of local villagers, education to local residents and outreach to government officials).

Nevertheless multiple barriers to success exist. Experience in PES (Wunder 2008/CIFOR, Landell-Mills and Porras 2002), CBNRM (Nelson 2010,) and forest co-management (Altman et al., 2009) show that equity between partners is critical for community partners to be able to secure livelihood benefits that exceed their opportunity costs and to be able to participate voluntarily. Where this is not achieved benefits may not meet expectations (Wunder 2005), conflict ensue, and intrusion into the PES site can occur (Box 8.5). Weak tenure or poorly-defined property rights, poor recognition of non-state actors rights, the lack of access to market information and institutional support, insufficient access to capital or credit and risk aversion are factors reducing negotiating ability and as a consequence benefits (Wunder 2008,Scherr et al., 2004, Sunderlin, Mohamed-Katerere and Jones 2011).

Local capacity to effectively negotiate is critical because PES can affect existing livelihood approaches and choices (Swallow et al., 2009). When the services are unique or non-substitutable bargaining power may be significant, however, in other circumstances prices will be dictated by larger market forces (Milder et al., 2010). Experience in the biofuels markets and REDD demonstrate the serious consequences for food security and livelihoods when social issues are poorly addressed and local actors are marginalized including through land and natural resource alienation (Cotula et al., 2008). One policy approach has been to adopt a set of safeguards for people and the environment. For example in relation to REDD, the World Bank and the UN-REDD programme are developing social and environmental safeguards (UN-REDD 2011/ WRI 2009 and 2010). There is however some evidence that a safeguard approach is insufficient in contexts where tenure rights are weak (Mohamed-Katerere and Jones 2011, see Box: 8.7). It is also critical that effective monitoring and evaluation systems are developed to take account of these challenges.

Identifying "sellers" and "buyers" can be challenging. This is of particular importance for marine and coastal PES due to the public good nature of these resources is the ability to identify "sellers" and "buyers" of the ecosystem service of interest. Institutional arrangements, such as community-based management, management concessions, and co-management schemes can substitute use and access rights for ownership (Box 8.5). Even in circumstances where potential sellers are clearly identified issues of "eligibility" can serve as a major constraint. Often satisfying criteria established by the PES market or programme such as requirements for legal land title and minimum area necessary for enrolment is challenging for small natural resource custodians (Milder et al., 2010). One consequence is that smallholders have had limited participation in land-use-based projects under the Kyoto Protocol's Clean Development Mechanism (Capoor and Ambrosi 2008). In addition, multiple layers of bureaucracy have undercut participation. Ensuring that the criteria for participation match realities

of poor people is critical for their participation (Wunder and Albán 2007). Successful participation hinges on participants having the skills, knowledge, resources, and tenure rights to enter into PES agreements and to deliver ecosystem services reliably. In the absence of meaningful engagement with environmental custodian state authorities often assume this role. This creates substantial challenges in ensuring benefits accrue locally as experience in the community-based natural resources management (CBNRM) sector has shown (Nelson 2010, Mohamed-Katerere and Jones 2011).

Box 8.7: REDD in Mozambique: A pilot project in the voluntary carbon market

In 2003 a commercial company, Envirotrade set up a carbon credit project as part of the voluntary carbon market in Sofala Province, Mozambique. By late 2009 the carbon project included 1 510 farmers enrolled over 100 km^2. The area consists of Miombo woodlands (sub-tropical), riverine forests and cultivated plots. The population relies on subsistence farming, wood-gathering and hunting. Poverty is high and people are still recovery from adverse impacts of the civil war, which ended in 1992.

Between 2003 and 2009, the project was able to sell carbon credits totalling US$1.3 million on the voluntary carbon market, corresponding to 156,000 tCO_2, at a price that averaged US$9.0 per tonne. The project relied on the developing of agro-forestry areas, boundary plantings, orchard development and avoided deforestation. Community farmers received a third of income, the initiating company received a third and its local non-profit subsidiary received a third for project monitoring and evaluation. Any excess funds were directed into a community trust fund. Potential benefits were effectively reduced by the costs of carbon production, which were relatively high at US 3.4 per tCO_2. In future projects it is not expected to be as high. Also the project did not manage to sell all the carbon sequestrated.

The effect of the carbon project was to increase rural employment from 8.6 to 32 per cent, whilst 73 per cent of households raised commercial crops compared with 23 per cent previously. There was also a notable development of social capital, with a measurable increase in literacy and the development of a business ethos with associated practical skills.

The project's defined criteria for success included the following: carbon stocks of Miombo woodland should be measured, agro- forestry systems should be established, carbon-stock and socio-economic baselines defined, carbon sales should be at least US$200,000 and there should be significant co-benefits to the community.

Payments were made to the farmers over a 7-year period – 30 per cent on initial plantings, 12 per cent per year for 5 years and 10 per cent in the final year. Thereafter it is assumed that the other benefits, including increased soil fertility would ensure farmers retain the trees.

The main difficulties revolved around measuring and evaluation carbon – including establishing a baseline and assessing increase – as there were no specific models to estimate biomass. Existing satellite data was judged to be insufficient. Other challenges related to community management and governance.

Source: Grace et al., 2010

Another obstacle in the development of PES is that funding has been drawn primarily from the donor/public sector (overseas development assistance, international conservation organizations, governmental agencies) and the market has been underutilized. Strengthening transparency and ease within the business environment by streamlining cumbersome procedures and reducing corruption and rent-seeking behaviour can encourage uptake of PES approaches. PES like approaches can be used to strengthen cooperation with the private sector and bring them in as partners in conservation

Other challenges include poor knowledge and information concerning the PES concept, weak or non-existent policy and legal frameworks, and unclear modes and strategies for payment delivery. Already some countries are engaged in South-South knowledge sharing initiatives, including between South Africa and Costa Rica. This initiative facilitates first-hand learning about Costa Rica's water-related PES strategies (CI 2011).

Several factors including "limited reach" and "market potential" demonstrate the potential for significantly expanding this sector. Opportunities for applying PES and other incentive-based conservation mechanisms exist as resource exploration, exploitation, and tourism development increase including in the coastal sector.[4] However, ensuring that these approaches strengthen socio-ecological resilience requires adopting policies and mechanisms to ensure that local livelihoods are not threatened, for example, by displacement, a reduction in available livelihood assets and an increase in risk (Mohamed-Katerere and Jones 2011).

The limited reach of PES means that currently only a small fraction of low-income people has been able to benefit (Milder et al., 2010). However, spatial analyses indicate that poor people inhabit many of the lands that generate key ecosystem services, suggesting a high degree of potential eligibility (Milder et al., 2010). In Southern Africa, for example, 2.7 million km^2 of miombo forest biomass stocks is conservatively estimated at 40 billion tons of carbon, which amounts to ten times the annual emission of fossil-derived carbon for the entire planet (Grace et al., 2010). Table 8.3 shows the potential market expansion in diverse environmental services till 2030.

Table 8.3. Potential for each market sector of PES to benefit low-income households and communities in developing countries within the next two decades.†

ECOSYSTEM SERVICE	BUYER			
	Public Sector	Buyer Private, regulated	Private, Voluntary	Consumers of eco-certified products
Biodiversity conservation	XX	XXX	XX	XXX
Watershed protection	XXXX	XX	XX	X
Carbon	X	XXXX	XXX	X
Landscape beauty or recreation	XX	0	XXX	X

† These are not predictions, but rather estimates of the number of low-income people that each market sector could benefit if the identified actions necessary to shape payment for ecosystem services to benefit low-income stakeholders are largely successful.
XXXX : Tens of millions of low-income providers could benefit.
XXX : Millions of low-income providers could benefit.
XX : Hundreds of thousands of low-income providers could benefit.
X : Fewer than 100,000 low-income providers are likely to benefit.
0 : The sector is unlikely to develop or will affect only a few low-income providers.

Source: Milder et al., 2010

Developing an effective PES approach that contributes to social-ecological resilience. depends on addressing the drawbacks identified above and strengthening the enabling conditions. At a regional level agreeing to a set of principles for PES implementation as well as systems for monitoring and evaluating both social and environmental could be important in developing such an approach. In addition it is important for long-term environmental stability that PES contributes to long-term livelihood assets rather than only delivering short-term benefits (Wunder 2005). Also as discussed above improving the reach and market viability is critical.

As illustrated in the CHICOP example (Box 8.6) in order for PES schemes to be successful, the ability to establish agreements and then enforce them or ensure that they are met is crucial. Therefore, a strong governance structure and political stability are important as agreements can last over many years. Examples of existing and developing PES schemes in different parts of Africa point to where these conditions might be met, such as payment for watershed services in East and Southern Africa (Stanton et al., 2010), forest carbon projects in Uganda (Rainforest Alliance 2010) and potential REDD projects countries (including Tanzania, Uganda, Ghana, Cameroon) and emerging legal

[4] Additional information on trends in resource exploitation will be made available in Draft 2.

frameworks for biodiversity offsets and compensation in Ghana, Guinea, Madagascar and South Africa (Madsen et al., 2010).

Enabling legal and policy frameworks are critical for extending PES approaches. For example adopting environmental regulations to stimulate new biodiversity markets could help grow this sector (Milder et al. 2010). The Western Cape Province in South Africa has regulations requiring biodiversity offsets where development has adverse impacts (Reference). Group certification systems and other protocols can be used to support entry into consumer-driven markets for eco-certified agricultural and forestry products. PES schemes can be built into the design of new marine protected areas as public-private partnerships for managing and financing at least parts of these new parks, such as those in development in West Africa and East Africa. Coastal "blue" carbon can be an extension of terrestrial carbon payments in coastal and marine habitats, such as mangroves and seagrass beds (Crooks et al., 2011).

Policy Option 4: Reduced Emissions from Deforestation and Degradation

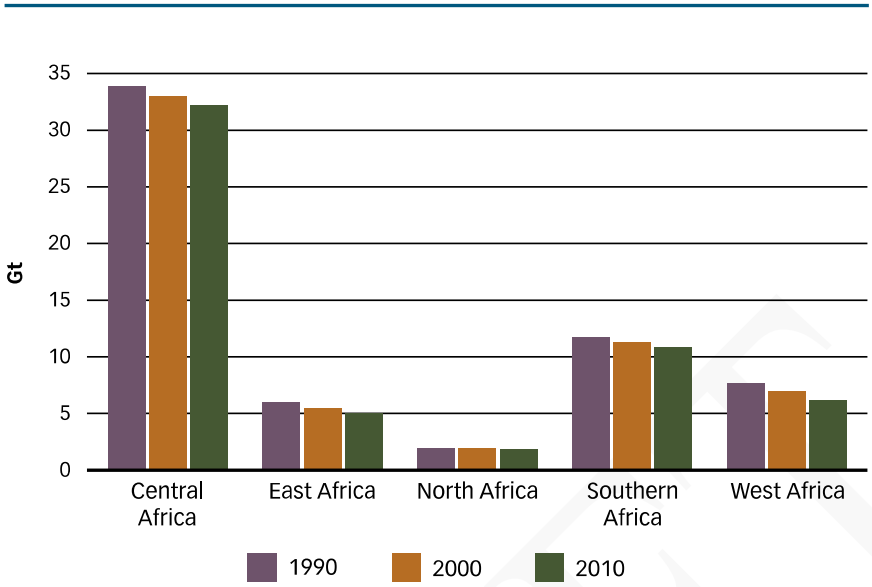
Reduced Emissions from Deforestation and Degradation (REDD+) is a payment for ecosystem services (PES) mechanism developed primarily for mitigation through carbon sequestration (UN-REDD 2010). From a developing country perspective it potentially includes a sharing of responsibility across countries (through a market mechanism) for mitigation. Considerable interest in developing countries in REDD has been generated because of the potential earnings and other co-benefits for people and the environment.

REDD is still in its early stages, a global agreement is still to be reached and full market approaches are being developed. Nevertheless there are multiple REDD preparatory processes, pilot projects and bi-lateral initiatives. Potential benefits and drawbacks are similar to those for other PES schemes as discussed above. Early lessons from REDD projects in Africa and elsewhere suggest that critical challenges include (Price Waterhouse Coopers 2011, Madeira et al., 2010, Box 8.7):

- Establishing REDD projects can be a lengthy and cumbersome process. The process from setting up the pilot to actually selling carbon takes longer than anticipated.
- The amount of money that will ultimately be realized is also often less than stakeholders think.
- Political support at the highest level is critical for these pilots to succeed
- Tenure or rights to the forest (and the carbon) by the environmental service producer (e.g. a community) is essential to ensure that the land concerned is not reallocated to agriculture.
- The mechanisms for benefit distribution and sharing are still poorly developed. How the carbon can be sold needs to be built into the designs. Often "middle-men" are used and these could be a problem.

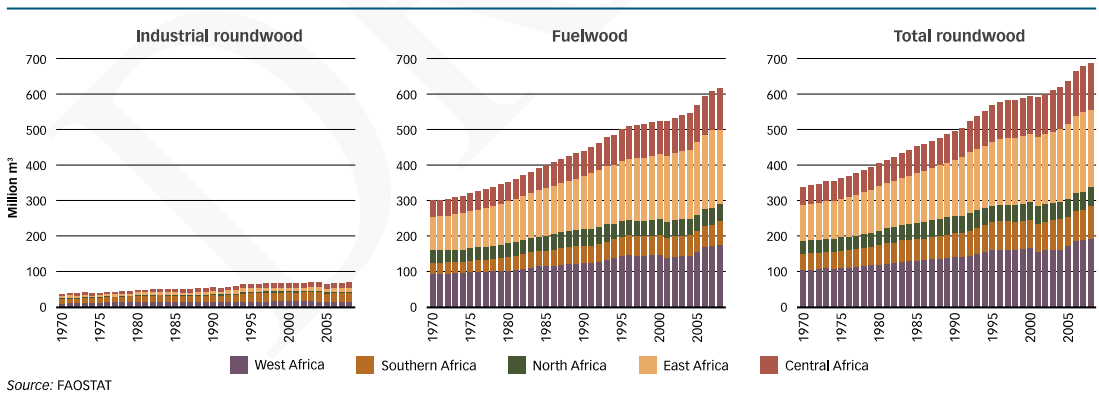
While it is evident that REDD+ has significant potential for conservation and for people, the benefits are likely to be spread unevenly across Africa especially if dryland and sub-tropical forests are not better provided for in REDD frameworks. According to the State of the World's Forests 2011, the five countries with the largest forest area (Democratic Republic of the Congo, Sudan, Angola, Zambia and Mozambique) together contained more than half the forest area of the continent (55 percent) (FAO 2011). For those countries with a high percentage of forest coverage - Seychelles (88 percent), Gabon (85 percent), Guinea-Bissau (72 percent), Democratic Republic of the Congo (68 percent) and Zambia (67 percent) (FAO 2011) – REDD could be significant. But overall carbon stocks are on the decline with deforestation remaining challenge, even though the rate of loss has slowed from 4.0 million hectares per year in the decade1990–2000 to 3.4 million hectares per year during the period 2000–2010. In 2010 the estimated forest area in Africa was close to 675 million hectares, accounting for about 17 per cent of global forest area and 23 per cent of the total land area in the region (FAO 2010).

Figure 8.3: Carbon stocks (terrestrial) in Africa 2005



REDD success – reversing forest decline and sequestrating carbon – will hinge on the extent to which its design takes into account the complex relationship between forests, trees and rural livelihoods including agro-forestry systems and none-timber forest products (ref) and provides appropriate governance and institutional frameworks to ensure mutual supportive ecological-social systems in which the resilience of each is reinforced. REDD earnings will need to exceed opportunities or benefits foregone from agriculture and the woodfuel market. As woodfuel is the most important energy source for many communities and nations, addressing energy supply will be critical for the future REDD. As Figure 8.4 shows extraction for fuelwood continues to grow.

Figure 8.4: Volume of wood removals in Africa, 1970-2008 (million m^3)

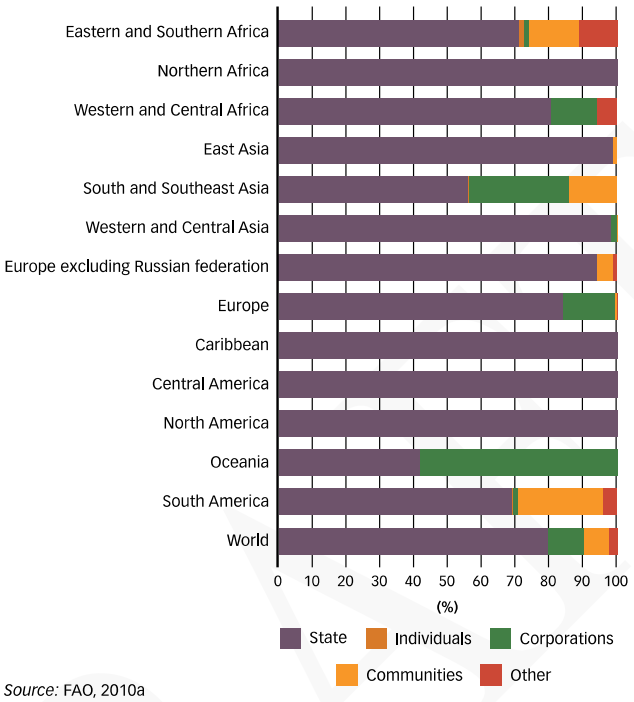


Source: FAOSTAT

In bi-lateral REDD projects or when governments are the main beneficiaries, governance systems will need to be designed to support pro-poor outcomes and fair benefit distribution if there is to be local custodian buy-in. This will require equitable and fair resource distribution and also give local custodians sufficient authority to exclude others. Recognizing traditional land rights, which have been formally recognized in international law (the Indigenous and Tribal Peoples Convention of 1989) as a human right provides an avenue for ensuring benefits (FAO 2011). States have corresponding obligations to regularize and secure these traditional ownership rights (FAO 2011) and to formally recognize the rights contained in the UNDRIP (ref). As shown in Figure 8.5, Africa still lags behind recognizing these forest rights, despite progress in some regions and an opinion from the African

Commission on Human Rights that recognizing IP rights is consistent with Africa's development and human rights agenda (Wachira 2008). At a global level it is now widely recognized that clear tenure rights are central to achieving social and economic development (FAO 2011). Without effective incorporation of human rights perspective in REDD design it is unlikely to be able to ensure the environmental integrity that underpin its mitigation objectives.

Figure 8.5



Source: FAO, 2010a

Policy Option 5: Integrated Social-Ecological Management

Integrated human-ecological approaches provide a management framework that takes account of complex, non-linear interactions between and within human and ecological systems across temporal and spatial domains. They include integrated water resource management (IWRM) and integrated coastal zone management (ICZM).

These approaches focus on managing ecosystems as a whole. The ecosystem-based management approach (EBM) has emerged from an increased application and understanding of ecosystem science that began in the 1980s. It prioritizes reliance on and enhancement of nature's infrastructure in sustaining nature and the interactions between people and nature. This approach seeks to maintain and restore natural ecosystems and the goods and services that they provide as a primary strategy to maintain system health (Davis et al., 2011). It also is one of the only ways to maintain the natural system's ability to adapt to change, as compared to other systems that focus on fixed targets and state variables that stay the same, or on hard-engineering solutions that often interfere with natural processes (Abdulla et al., 2011). With variability in climate and environmental parameters becoming a major feature of natural systems under global climate change, the appeal and relevance of the ecosystem-based approach is increasing rapidly, as one of the only mechanisms that may succeed in maximizing nature's ability to cope with change. Increasingly Ecosystem-based Adaptation (EBA) and the tools to sustain it, (EBM), are rising to the top of global approaches for managing the environment, resource use and peoples' interaction with the environment. Experience in ICZM provides important lessons for policy makers and demonstrates the overall value of this approach.

Ecosystem based management is necessary when there is recognition that the challenges must be addressed and managed at a regional case in order to maintain the functions of the ecosystems of concern (Davis et al., 2011). One such marine ecosystem is the African land-sea interface. The African coast is one of the highest ecosystems in biodiversity, but also one of the areas where the most impoverished people live (Abdulla et al., 2009; Gustavson et al., 2008). Anthropogenic impacts on the coast include fishing, industry, pollution from urban centres and tourism. Direct environmental problems in the coastal zone include coastal erosion, depletion of fish stocks caused by over-fishing, reduced biodiversity in coastal waters due to unsustainable resource use and pollution, habitat destruction, loss of mangroves and corals including coral bleaching, and poor water quality due to industrial and domestic pollution and run-off (Hewawasam 2000). In addition to being highly productive and biodiverse, coastal zones provide crucial habitats for a variety of species including nursery habitat for marine life, and coral reefs, mangroves, and dune systems are invaluable as natural protection against heavy weather and erosion (Post and Lundin 1996).

Integrated Coastal Zone Management

A widely used strategy for managing entire coastal ecosystems is Integrated Coastal Zone Management (ICZM). The approach was launched globally at the Rio Summit in 1992 (UNCED 1993) and aims to plan and manage cross sectorially, involving all levels of governance and encouraging the involvement of all stakeholders in the planning of management strategies for the coast (Hewawasam 2000, Post and Lundin 1996). With the objective of balancing economic development and environmental protection in coastal zones, ICZM has been integrated in national policies and implemented through projects in Africa. Between 1993 and 2000 the number of coastal countries that adopted ICZM increased from five to 13 (Gustavson et al. 2009). In Northern Africa, the ICZM protocol of the Barcelona Convention covers the Mediterranean countries Egypt, Libya, Tunisia, Algeria and Morocco. The countries recently ratified the protocol in 2011, and the parties committed to introducing ICZM in national and regional policies on coastal management (UNEP-MAP 2008; UNEP 2011). ICZM initiatives introduced in North Africa include the CAMP projects in Egypt, Morocco, and Algeria (Box 8.8), as well as numerous regional and national Action Plans (see SMAPIII 2009).

Box 8.8: The importance of national commitment and coordination: North Africa

The Coastal Area Management Programme (CAMP) is a programme that facilitates practical coastal management projects along the Mediterranean coast applying the principles of ICZM. In North Africa, CAMP projects have been identified along the coast of Egypt and the Mahgreb countries according to criteria such as project sustainability, representativeness and replicability, political commitment and interest in project. ICZM CAMP projects were implemented at multiple scales working towards engagement at local level, integration in policies and strategies at national and regional level, and at the wider international level through co-operation, exchange with the ICZM Protocol under the Barcelona Convention. CAMP projects in North Africa include the Fuka-Matrouh (UNEP/MAP) project which cover a coastal stretch of 100km from Marsa Matrouh to east in Fuka, Egypt. In Morocco, the 'central Rif' CAMP project includes the provinces of Chefchaouen and Al Hoceima and utilises and ICZM approach to managing sensitive wetland areas. In Algeria, the Algerian Coastal Area CAMP (UNEP/MAP) project was initiated in 2001 covering a coastal stretch of 115 km. Some of the challenges identified include: lack of continuous financial commitment to the ICZM implementation which have resulted in many projects halted; lack of public participation and visibility of the ICZM projects; and lack of appropriate national legal frameworks for ICZM (Gonzàlez-Riancho et al 2009, SMAP III 2009).

In East Africa, the Nairobi Convention provides a legal framework and mechanisms for cooperation in ICZM between East-African countries (UNEP 2011). One example of a practical implementation of ICZM is from Tanzania, where the Marine and Coastal Environmental Management Project (MACEMP) ensures economic growth amongst coastal communities through sustainable use of the coastal resources (Gustavson et al., 2008, World Bank 2011). The Regional Coastal Management Programme of the Indian Ocean countries (ReCoMaP) assists countries in applying ICZM principles in national policies and practice, providing capacity building in ICZM for national and local

stakeholders (ReCoMaP 2011). The Secretariat for Eastern African Coastal Area Management (SEACAM) is made up of senior government representatives and works to assist the Eastern African coastal countries to implement and coordinate coastal management. ICZM efforts in West and Southern Africa include the Water Pollution Control and Biodiversity Conservation in the Gulf of Guinea Large Marine Ecosystem (GOG-LME) as set forth by the Accra Declaration (1998). The World Bank has also been involved in ICZM initiatives in West Africa since the mid-1990s (Hatziolos 1997). South Africa has an ICZM policy and Action Plan (MCM/DEAT 2000) through which governments have initiated innovative programmes such as 'Working for the Coast' where local people are paid to clear the coastline of pollution and rehabilitating coastal ecosystems (DEAT 2011).

Box 8.9: The importance of regional coordination and guidance: Toliary, Madagascar

Following the integration of ICZM principles in the National Environmental Action Plan (NEAP) of Madagascar, an ICZM program was initiated in 1997 and focussed on the Toliary region in the southwestern part of the island. Toliary is a region which suffers from a range of human-induced environmental problems, including pollution, eutrophication caused by urban runoff, reduced fishing yield attributed to over-fishing, reduction of mangrove forests, scarcity of fresh water and deterioration of coral reefs. An assessment of ICZM in this region found that the main difficulty in successful implementation stemmed from the lack of regional coordination (Billè and Mermet 2002; Billè 2008; Billè and Rochette. 2010.). Some of these challenges include the lack of clearly defined work programs, procedures and regular coordination meetings where ICZM principles are applied.

Experience in Africa and elsewhere demonstrates that EBM approaches like ICZM can be strengthened through for example the use of spatial planning tools. Spatial planning, including in marine ecosystems, has grown rapidly with the development of new technologies, giving vastly improved abilities to replicate the spatial structure of nature in models of human-environment interactions. Spatial planning is a relatively mature field for terrestrial studies but, somewhat surprisingly, has only recently been adopted by a broad community in marine systems. In this realm, the term applied is typically 'Marine Spatial Planning' or simply 'MSP', which is a strategic decision-making process that creates a blueprint for ocean use and, for the most part, is GIS-based. MSP might be thought of as the visualization and mapping side of EBM — but it can also help to drive the organizational restructuring necessary for management integration (Davis et al., 2011). With many ecological interactions having spatially explicit components, such as the zonation of coral reefs with exposure and wave energy, MSP provides unprecedented power to improve all aspects of ecosystem understanding (Abdulla et al., 2011), and in particular planning for interventions in EBM and EBA (e.g. South Africa: Cowling 2003; US: Davis 2005, Australia: Fernandes et al., 2005).

Decision-making support tools such as MSP have the capacity have flexibility to deal with the complex resource requirements and social fabric present in the conditions of many developing nations, specifically along the coast. However, one of the key strengths of many decision support tools is that they explicitly recognise that there are valid competing demands on natural resources and that conservation and EBM solutions must work within the capacity of local communities. As a result, these tools are generally intended to, and can, be used to develop equitable and implementable solutions to the conservation of socio-ecological systems in developing countries. These tools can often enable useful management and defensible resource allocation decisions to be made in data poor environments (Bode 2008), through the use of a variety of easily available surrogate measures and variables (Game 2008; Abdulla et al 2011).

Policy Option 6: Sustainable Land Management

Content related to this section is currently under development, and will be available in Draft 2, which will undergo an external expert peer review process.

Policy Option 7: Local, inclusive and participatory approaches

Policies that strengthen the rights of local users to participate in management and to resources can help strengthen environmental stewardship and conservation outcomes (Sunderlin et al., 2008; Nelson 2010). Such approaches address a key driver of deforestation and biodiversity loss – the historical loss of rights of local people to utilize resources (Roe et al., 2009). In the biodiversity sector exclusion and prevention of customary management has reduced the effectiveness of protected areas despite the large sums of money and manpower invested in them (Brown 2003, Bhagwat and Rutte 2006). A growing number of countries have policies for CBNRM, indigenous and community conserved areas, co-management approaches, and community forest management (Roe et al., 2009, Koech et al., 2009, Burrow 2002).

These approaches can encourage alternative land use and shift the focus a way from agriculture. This can encourage a better match between economic/livelihood use and ecological conditions. However a key challenge in sustaining these approaches has been low level of earnings from wildlife management (Murombedzi 2010, Nelson 2010). Where CBNRM is incorporated in broader landscape approaches they can be an important part of a cluster of tools that improve environmental quality and the conservation of biodiversity outside of protected areas. This mirrors the understanding that the greatest threat to biodiversity lies outside of protected zones. In Tanzania which has set aside over 28 per cent of its land to protected areas, wildlife migrations outside these areas continue to cause severe conflicts with the growing rural populations and their associated human development activities. Integrated approaches in community based conservation, such as the Wildlife Management Areas (WMAs) aim to address these challenges. Other benefits from these approaches include opportunity for social learning and adaptive response to changing realities. However success is premised on developing appropriate institutional arrangements to facilitate collaboration, decision-making and action across diverse actor groups.

These inclusive approaches support the realization of the goals by bolstering long-term interest in sustainable approaches by primary user groups (Jaeger et al., 2007) as shown in the Arabuko Case Study (Box 8.10). Creating fairer access to resource and recognizing cultural rights of marginalized groups, including indigenous people as envisaged under the UNDRIP helps address the social aspects of the goals and can improve biodiversity outcomes (Box 8.11). This in turn strengthens over all resilience.

Box 8.10: Butterfly Farming in Arabuko Forest

The Arabuko forest (42 000 ha) in Kenya's coastal region is home to a community-based enterprise that has provided an incentive for public participation in forest conservation by encouraging sustainable use of forest resources for improved livelihoods. The Kipepeo project (Swahili for butterfly) has earned over US$ 80 000 annually, of which 90 per cent is from the export of butterfly pupae mostly to the USA and Europe. This additional or alternative revenue around the forest and minimized the destruction of forests biodiversity. The project has demonstrated how the principles of sustainable development as highlighted in Article 10 of the can be integrated into policy, programmes and projects in order to avoid or minimize adverse impacts on biological diversity.

The Kipepeo Project demonstrates the tangible link between biodiversity conservation and sustainable livelihoods by shifting forest utilization from consumptive use of forest wood products such as firewood, charcoal and timber which is unsustainable, to non-consumptive commercial use of forest insects especially butterflies and bees which is sustainable. The initiative has also helped to increase the awareness of communities and national institutions of the ecological and economic importance of insects and their forest habitats by highlighting and demonstrating the direct links between commercial insect and forest conservation.

Potential for replication of these projects is high. Butterfly farming is now practiced in three other areas within Kenya including the Kakamega forest, the only true rain forest in the country. Butterfly farming is also being successfully replicated in Tanzania within the East Usambara mountain forest in the Eastern Arc forest eco-region where the farmers earned 50 000 dollars in 2007.

Box 8.11: Indigenous & Community Conserved Areas

Historically communal biodiversity stewardship including of sacred sites and groves have reinforced and boosted biodiversity conservation (Lee and Schaaf 2003). Many such areas continue to exist today (Lee and Shaft, Dudley, CBD 2010, 40), with some estimates placing the extent of Indigenous and Community Conserved Areas on par with state protected areas (ICCA Forum). Although full acknowledgement remains weak, several countries have supportive policies and there is evidence of success (Lee and Schaaf 2003, Dudley et al., 2005), these include:

- Sacred forest and groves in Cameroon's Bakossi National Park have significantly higher plant species' diversity than the adjacent Mt. Cameroon with 2 435 species.
- In Ethiopia, the woodlands occupied by church and monastic communities are also important as habitats for biodiversity, sources of germplasm, and as indicator sites of the original ecological landscape

- Ghana's The Tafi Atome Monkey sanctuary protected by the local population through traditional conservation backed by statutory enforcement in co-operation with local communities has the last True Mona monkeys (*Cercopithecus mona mona)*

- *Kenya's* Mijikenda Kaya sacred forests provide protection of 6 000 ha of coastal forests through traditional conservation

The Community Conserved Area of Mangagoulac in Senegal is an example of successful conservation. It encompasses 12 villages with about 8 000 people in an estuarine setting with rich mangroves and traditional rice agriculture (Borrini-Feyerabend 2011)

As both cultural and biological diversity is under threat the local fisherman set up a CCA and their own association, Aire du Patrimoine Communautaire (APAC). Management rules have been set up for this 15 000 ha area. These include a zoning system and rules for preservation (known locally as longterm biological resting) and sustainable use areas. Rules control fishing and the use of motorized boots. The APAC successfully applied for formal recognition to the Regional Council of Casamance (Borrini-Feyerabend 2011).

The success and sustainability of ICCAs is dependent on the ability of local communities to make decisions about land and resource uses, hold secure tenure over resources, and exclude outsiders from appropriating resources (Blomley et al., 2007).

Recently both the CBD COP 10 at Nagoya and The World Parks Congress have recognized that these approaches complement the existing network of state protected areas (CBD COP 10 Decision X/31on Protected areas) suggesting that these approaches have a high potential for replication.

Research in the forest sector demonstrates that inclusive approaches can support more effective decision-making and result in benefits for forests and people (Rights and Resources Initiative 2009).

The percentage of forests under community tenure is growing, but as Table 8.4 shows, remains very small. Forests under state control amounted to 97.9 per cent, 1.6 per cent was designated for community use, 0.4 per cent was owned by community groups, 0.1 per cent by private communities (Rights and Resources Initiative 2010). These proportions lag behind the global averages (Sunderlin et al., 2008) and the full benefits achieved in other regions, particularly in LAC and Asia, have not been realized (RRI 2010). The small amounts of forests under community tenure mean that benefits remain case study based and cannot be modelled at larger scales. Nevertheless a significant body of research shows that improved community security over the local forest commons has made these landholdings were less vulnerable to appropriation by others and hence conversion. This has led to improved earnings for communities and biodiversity gains (Sunderlin et al., 2009). In Uganda, enforced forest property rights are associated with improved forest condition (Banana et al., 2000). Other benefits include improved understanding and strengthened trust among different stakeholders; this can support successful dispute resolution. Community forest management can also reduce overall management costs. While a direct correlation to ongoing deforestation cannot be made, it is insightful to note that progress to reduce deforestation in Africa also lags behind global averages even though the rate of forest loss has slowed.

Table 8.4: Forest tenure in Africa's most forests countries (millions of hectares) (2002-08)

Country (by descending forest cover)	Public				Private			
	Administered by government		Designated for use by communities & indigenous group		Owned by communities & indigenous groups		Owned by individuals & firms	
	2002	**2008**	**2002**	**2008**	**2002**	**2008**	**2002**	**2008**
Democratic Rep of Congo	109.20	133.61	0.00	0.00	0.00	0.00	0.00	0.00
Sudan	40.60	64.68	0.80	2.82	0.00	0.00	0.00	0.05
Angola	59.73	59.10	0.00	0.00	0.00	0.00	0.00	0.00
Zambia	44.68	42.44	0.00	0.10	0.00	2.05	0.00	0.00
Tanzania	38.50	31.79	0.40	1.58	0.00	0.00	0.00	0.06
Central African Rep.	22.90	22.76	0.00	0.00	0.00	0.00	0.00	0.00
Congo	22.06	22.01	0.00	0.46	0.00	0.00	0.00	0.00
Gabon	21.00	21.76	0.00	0.00	0.00	0.00	0.00	0.00
Cameroon	22.80	20.11	0.00	1.14	0.00	0.00	0.00	0.00
Total (all cases)	**381.46**	**418.26**	**1.20**	**6.10**	**0.00**	**2.05**	**0.00**	**0.11**

Source: Sunderlin et al., 2008

Significant barriers to successful implementation remain for these and other community-based approaches. The inadequate enforcement and implementation of reforms remains a challenge. For example, in Mozambique, the 1997 Land Law acknowledges the community tenure rights of historic occupants, but surveys show that government officials responsible for implementing the law and supporting communities asserting their rights have little awareness about the rights and procedures to secure them (Serra and Tanner 2008). In other contexts the complementary rights needed to make community forests a success are lacking (Sunderlin et al., 2009). In Liberia, for example, even communities with formal title to customary properties, almost all of which have substantial forests, have no rights to the trees on that land and their consent is not required for logging (Alden Wily 2007). In Central and West Africa, large areas have been designated as community forest, but the allocation and processing of community entitlement is slow (Sunderlin et al., 2009). In some contexts, forest authorities are reluctant to lose power, sometimes because of their belief that local communities are incapable of managing resources sustainably. In many co-management forests communities find they have an inadequate share of timber royalties as a result of weak governance that for example allows for elite capture (Katerere and Mohamed-Katerere 2006) or an unwillingness of authorities to

share benefits (Alden Wily 2007). Market participation within communities is undercut by inadequate finance, poor information and technology flows, inadequate market links, inability to exploit economies of scale due to their small size and organizational gaps (Sherr et al., 2004).

Continued replication of participatory forest management is an indicator of overall support for this approach. While percentages of forests under community authority are low, over 30 countries are engaged in these initiatives. These countries include Benin, Burkina Faso, Ethiopia, Gambia, Guinea, Madagascar, Mali, Lesotho, Nigeria, Ghana, Senegal, Sudan, Tanzania and Zambia. More than 200 community forests have already been created through this process in the Gambia, and more than 500 in Tanzania (Barrow et al., 2002).

Policy Option 8: Human Rights

Policy approaches that are based on the recognition of fundamental human rights can be critical for strengthening human wellbeing and realizing the MDGs – while delivering benefits for the environment (Knight 2010/FAO, Human Rights Council Social Forum 2010, Mohamed-Katerere and Jones 2011, Campese et al., 2009, Kravchenko and Bovine 2008).

A growing number of countries are incorporating human rights perspectives in conservation and recognizing fundamental human rights in governance (inclusive biodiversity and forest management) and in access (Rights to water in Uganda, the Democratic Republic of the Congo, and South Africa). All countries are also party to the African Charter of Human and People's Right (Banjul/1981), which guarantees the "right to enjoy the best attainable state of physical and mental health."

Box 8.12: Recognizing a human right to water can promote fairer access

Section 27 of the South African Constitution provides that, "Everyone has the right to have access to sufficient water." The *Free Basic Water Policy* 42/ 2001 complements this. The beneficiaries of the *Free Basic Water Policy* are many and varied. Many impoverished households will benefit from secure access to 25 litres of water per person per day for domestic use within 200 meters of the household (Mehta 2005). This amount tallies with the WHO recommendation of minimum for consumption and does not extent to health.

The policy has encouraged municipal authorities to invest in achieving this goal. This has positive human well-being outcomes. This reduces the time and effort women and girls spend collecting water at the household level, freeing them to engage in other activities. The health benefits are clear since they do not resort to unprotected sources of water (Mehta, 2005). The government also stands to benefit from improved image, an important leverage in achieving political stability. Finally it is envisaged that this will result in job creation.

A major challenge for the policy is striking a balance between the human well-being benefits and cost implications (DWAF 2000a). However the human well-being benefits are seen to outweigh the associated costs (Stalk, 2004).

One of the aims of the policy was to decentralize the responsibility of the provision of water to the district level. This has pushed the district municipalities to become more innovative (Stalk, 2004). However many municipalities are severely challenged in this role. The policy has proved too costly for the district municipalities to implement the scheme (DWAF 2000) and this has resulted in litigation by effected citizens to claim their rights. In the Constitutional Court case *Mazibuko v City of Johannesburg*, the court took the approach of progressive realization of human rights. Effectively this requires the state to take reasonable legislative and other measures, within available resources, to achieve the right (Larson 2010). Given cost and other barriers the policy is still to be implemented in the rural areas.

Other institutional and organizational challenges affecting successful policy implementation, include the lack of information and capacity building. This case study demonstrates that critical enabling factors include: (1) addressing the principle of cost-recovery, (2) identifying target groups, (3) ensuring financing, (4) demand management, (5) capacity building and information, and (6) the expansion of the infrastructure.

The significance of taking a human rights approach to access is illustrated by the South Africa experience, which led not only to improved access but a refocusing of government priorities and spending. On the contrary global research shows that the lack of rights often underpins high levels of vulnerability(International Council on Human Rights Policy 2008), as experience with land alienation driven by global investments in Tanzania (Locher 2011, Cotula 2011).

Human rights approaches are likely to become more important for achieving critical development and environmental goals, where there is a growing emphasis on the commercialization of natural resources (Bond and Dugard; Box 8.13). Human rights provide a benchmark for making choices and encouraging equity and non-discrimination in outcomes, including in the distribution of costs and benefits (International Council on Human Rights Policy 2008). For example, it provides a method for weighing environmental policy and development choices against impacts on a right to food, a right to life, and the right to a clean, healthy environment. Human rights recognition can provide a normative basis for engagement between different actors and strengthening coherence between different levels and sectors by emphasizing cooperation based on fundamental principles, and encouraging long-term perspectives based, for example, on Intergenerational Right (Human Rights Council). Once decisions have been made litigation can as Box 8.13 shows provide a basis for evaluating decisions

Box 8.13 Environment and Human Rights helps ensure the sustainability of development choices.

A growing body of International Human Rights case law emphasizes the centrality of environment and human rights in assessing development choices and ensuring environmental integrity (Kravchenko and Bovine 2008). For example in *Mayagna (Sumo) Awas Tingni v Nicaragua* 2001, the Inter-American Commission and Court of Human Rights ruled that granting a logging concession on traditional lands violated the right to the use and enjoyment of property (Nicaragua). In the African context such rights recognition can be important, for example, in helping local people secure their rights in global land deals.

In Nigeria, communities have used human rights law to oppose oil exploration that has adversely impacted on agricultural land and biodiversity (*Kenule Beeson Saro-Wiwa, President of the Movement for the Survival of the Ogoni People (MOSOP) and Eight Others (unreported, 1995) (*Frynas 1999). In 2002, the African Commission on Human and People's rights found that in terms of the African Charter that the Nigerian government has an obligation to protect the well-being of the Ogoni People (*Social and Economic Rights Centre v Nigeria).* Giving effect to this decision would limit the way in which oil exploration activities take place and ensure protection of the environmental, health and livelihood. This would require finding synergies between development, environment and social priorities.

Given the emphasis on governance, Human Rights approaches can through participation and consent measures, such as free prior informed consent, ensure that local priorities, interests and rights are taken into account, enhancing overall capacity to adapt and cope with environmental change and disaster. In South Africa for example the High Court overturned a decision of the Department of Environmental Affairs and Tourism allowing the construction of a Demonstration Model pebble bed modular reactor, because the public participation procedures had not been correctly followed (*Earthlife Africa v Department of Environmental Affairs and Tourism and Eskom Holdings*, 2005). These processes – although they might appear to be cumbersome, encourage rigour in decision-making and ensure multiple issues and values are taken into account. In the long-term they encourage political stability and good social relations – a fundamental determinant of human well-being.

However, as the South African water rights experience demonstrates human rights approaches can be severely limited by costs (Larson 2010). The capacity of rights-holders to claim, protect and enjoy their rights is also adversely affected by the lack of access to information and knowledge, access to justice (including courts and tribunals) and capacity.

Notwithstanding the challenges in the South Africa water rights experience, there is potential for

replication. For many African countries, the fast pace of urbanization will increase the challenges of water supply. Developments in the international domain and specific recognition of environment-human rights intersections provide a basis for this. In 2010 the UNGA formally recognised the right to water (UNGA 2010). This follows the elaboration of the right in General Comment 15 of the UN Committee on Economic Social and Cultural Rights. The African Commission on Human Rights found that failing to provide basic services, such as water, is a violation of the environmental right in the African charter. Importantly several countries now recognize this right in their constitutions including Uganda, DRC and South Africa (Winkler 2008).

Extension of human rights approaches to other domains. For example, human rights perspectives can encourage decision-making that addresses the synergies between well-being and environment, environment and development choices, and environment and vulnerability. A focus on Human Rights helps make vulnerabilities visible by desegregating data and drawing attention to (1) the specific ways in which rights will be impacted and (2) who will be impacted (International Council on Human Rights Policy 2008) and consequently support adaptation and disaster risk reduction.

Strengthening existing regional architecture is also an option. Already most African countries have acceded to Africa Charter, other conventions, declarations and resolutions that explicitly recognize these rights. Regional action through defining agreed future approaches and strengthening regional court system could be decisive in making this approach viable.

Policy Option 9: Community Based Adaptation: Water Harvesting

Content related to this section is currently under development, and will be available in Draft 2, which will undergo an external expert peer review process.

Policy Option 10: Coastal and Marine Protection against Sea-level Rise

Many of Africa's major cities and settlements are on the coast and face threats from rising sea levels; this places infrastructure, people, cultures and ecosystems at risk (UN-Habitat 2010). There is a growing shift in policy away from engineering solutions to nature-based solutions; these include integrated environmental planning and ecosystems restoration. It is now recognized that mangroves can be a critical component of disaster risk management and climate change adaptation.

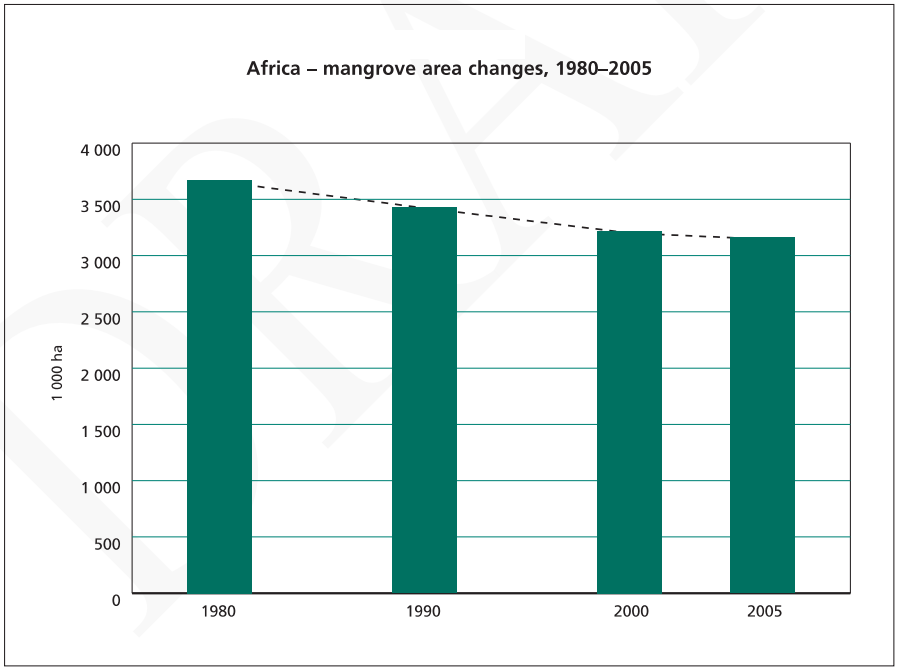
Mangroves play a critical role in climate resilience (McCloed and Salm 2006), by maintaining ecosystems services and goods in both terrestrial and marine ecosystems (Duke et al., 2007) that underpin human wellbeing. Securing wellbeing is essential for retaining adaptive capacity and also the willingness to take risks by trying new approaches. For local communities, mangroves are an invaluable source of food and wood, for fuel, boat building, fencing and fish traps. The Rufiji River Delta contains the largest estuarine mangrove forest on the eastern seaboard of the African continent and is home to over thirty thousand people who live, farm and fish in its fertile agricultural lands and rich fishing grounds (Carrere 2009). Commercial fishing is also closely linked to mangrove health. The mangrove forests of Nigeria – Africa's largest and the third largest in the world – provide breeding grounds for over 60 per cent of fish caught between the Gulf of Guinea and Angola (World Rainforest Movement 2002 cited in Carrere). Mangroves enhance climate change coping capacity by stabilizing coastlines and protecting coral reefs and sea grass meadows and consequently offer vital protection to life and property against sea-level rise and saltwater intrusion. The 2006 Asian Tsunami demonstrated that these ecosystems provide a natural barrier – although the extent of this is depends on multiple factors include the size of waves (Liu et al., 2005). Coastal erosion and flooding as a result of mangrove deforestation, as in the Niger Delta, has resulted in the loss of settlements (UNEP 2007). Mangroves also play a valuable role in climate mitigation as carbon sinks and for sequestration

(Zelder and Kircher 2005; McCloed and Salm 2006) Consequently in the context of climate change protecting, rehabilitating and establishing the conditions for maintaining or strengthening resilience of these vital ecosystems is increasingly seen as critical (Adger et al., 2005, ISDR 2011)

Africa is well-endowed – but stands to loose this rich ecological heritage if concerted efforts are not made to strengthen policy frameworks. Africa's 3.2 million hectares of mangroves, extend from Mauritania to Angola on the Atlantic coast and from Somalia to South Africa along the Indian Ocean, with more than 27 countries having mangrove forests (Ajonina et al., 2008). But, over the last 25 Africa has lost about 500,000 hectares of mangroves, with many more being severely degraded (FAO 2007; Zelder and Kercher 2005). In West Africa, mangrove areas have diminished by close to 25 per cent and nearly 30%, Central Africa (Ajonina et al., 2008).

The resilience (or conversely, the vulnerability) of coastal societies and ecosystems is tightly linked to larger-scale changes including through globalized trade in commodities and in ecological goods and services, oil and agricultural investments, and transport (Adger et al., 2005). Other pressures and drivers of mangrove loss, many of which come from outside effected countries include population growth, urbanization and infrastructural development; quarrying, salt and sand extraction; pollution from industries, agro-industrial chemicals, petroleum and gas exploitation including oil spills; shrimp aqua-culture, deforestation for fish smoking and fuelwood; invasive species (Ajonina and Usongo, 2001; Ajonina et al., 2005). Climate change, including drought, will also impact on the resilience of mangrove ecosystems.

Figure 8.6



Although a coherent approach to mangrove ecosystems is still lacking, a mix of policy approaches has been used to protect these vital resources including protected area approaches (Ramsar), community based management, pollution management, and integrated land-use planning. Multiple actors – governments, civil society, and local communities – are involved. Six West African governments recently signed the Mangrove Charter for West Africa, which commits them to protect the sub-region's mangroves and establishes country-specific Action Plans. Civil society, such as the African Mangrove Network Capacity who have activities in Congo, Guinea, Senegal, Benin, Nigeria and Ghana, are taking a lead role in mangrove reforestation and evaluation (Armah et al., 2009).

Community based approaches create an opportunity to address the links between creating the conditions for ecological resilience and social resilience; this is of critical importance given the high dependency of many poor communities on these resources (See also Policy Option 7). Securing local participation however is not always straightforward and as shown in Box 8.14 it is important for there to be a convergence in understandings of risk averted, risk associated with the adaptation choice, and the solution. Ghana's protected areas approach demonstrates that it is important that solutions factor in the specific vulnerability impact on communities of exclusion. In the Keta Lagoon Complex, for example, which has a management area of 1200km² and lagoon area of 300km² and is a wetland protected area under the Ramsar convention, local demands for benefits has effected overall sustainability newly adopted approach consequently focuses on multiple-use management and significant local participation (Ajonina et al., 2009). Consequently a modified management approach has two main components: awareness creation and capacity building among local communities to enable mangrove restoration and sustainable use, and creation of alternative income-generating activities. The loss of access to resources whether as a result of policy change or environmental change can exacerbate existing inequities (Brouwer and Nhassengo 2006; Tweneboah 2003). For example female-headed households may face added risk from the loss of fishing resources (Carrere 2009). These close links between ecological resilience and integrity and human well-being and resilience suggest a need for better integration of mangrove conservation, disaster risk management and poverty reduction strategies (Ajonina et al., 2009).

Box 8.14: Social learning and knowledge in community based adaptation strategies.

Achieving shared understanding and support for environmental solutions among different actors is not always easy. Different values, priorities, and experiences all shape choice making. Given that adaptation is about local choices it is important that climate resilience strategies achieve such understanding among policy makers, technical agencies and communities.

The relative success of WWF-US and the Global Environment Facility Project Development Facility Community-based mangrove management in Cameroon can be attributed to this. A case study of this project identifies multiple benefits (Ajonina et al., 2009). Communities of Campo Beach raised over 4000 mangrove seedlings in community-run nurseries. These were planted as a "green shield" to protect Campo Beach from coastal erosion and wind. This project was based on negative experience from collapsing engineering construction of concrete walls along the beach. Members of local organisation in the Campo village monitor nursery seedling development and record in conceived data sheets. Communities also supported the demarcation and control of community mangrove wood gathering zones enforced by the local mangrove management committee (COPCVAM). To address this loss of fuel wood a strategy for more energy-efficient mangrove wood use was established. This included establishing energy efficient fish smoke houses. The early involvement of communities in design and management of the project has set the basis for an ongoing role of the communities in monitoring and evaluation of progress.

In contrast experience with the government-initiated resettlement scheme following the Cyclone Eline in 2000 in Mozambique tells a different story (Patt and Shroeder 2005). Two million people were effected - more than 7000 people were stranded in trees for several days, 800 people died, hundreds of thousands were left homeless. Over 90% of the irrigation systems in Mozambique were lost. In the aftermath of the floods the World Bank estimated direct costs of $273 million and $428 million in optimal standard reconstruction costs. In the aftermath the government and aid agencies sought a solution. Given the risk of flood and to reduce the high level of exposure the government built resettlement villages on higher ground, but few moved in and of those who did many subsequently left. For farmers the "risks" associated with this relocation outweighed the perceived danger of staying in the floodplains. The loss of easy access to fertile land and of social support is among the key factors. Other adaptation strategies also did not garner support: the benefits of alleviated grain storage to save them from floods did not deal with the challenges of high winds nor had the issue of pests been factored in. A second major challenge was that farmers and policy makers disagreed about the seriousness of climate risks. A project to provide more information about climate change to farmers did not change their beliefs. The results highlight the need for active dialogue across stakeholder groups, as a necessary condition for formulating policies that can then be successfully implemented (Patt and Shroeter 2005).

Sources: Ajonina et al., 2009, Patt and Shroeter 2008

For many countries effective management faces institutional challenges. For example although mangrove ecosystems are designated as sensitive by Ghanaian law (with any development requiring an Environmental Impact Study), several institutional and policy barriers to successful mangrove management can be identified. These include (Gordon et al., 2009): (1) The lack of coordination, collaboration and networking among the policy developing institutions on one side and policy-implementing institutions; (2) The multiplicity of ministries and agencies whose activities impact on mangroves and biodiversity. These include the National Development Planning Commission, Ministries of Environment and Science, Lands and Forestry, Food and Agriculture, Justice, Local Government and Rural Development, Environmental Protection Agency, Fisheries Commission, Water Resources Commission and Wildlife Division of the Forestry Commission; (3) a lack of institutional capacities especially in data collection, monitoring and information management; (4) Sector-based, conflicting, obsolete, deficient and unenforceable legislation; and (5) Inappropriate land tenure systems encourage the cutting and selling of trees as those holding short-term leases (ten years) seek to maximize return on mangroves. This and similar experiences elsewhere suggests that successful mangrove conservation and reforestation will require better institutional integration as well as better knowledge-policy interaction. In addition the potential roles of different actors in management needs to be supported by appropriate governance frameworks. The sharing of management authority requires cross-level interactions and cooperation, not merely centralization or decentralization (Adger et al., 2005).

Enhancing conservation of these ecosystems and their capacity to regenerate, in the aftermath of extreme events, will require better understanding of the linkages between different ecosystem components (Ajonina et al., 2009, Davis et al., 2011, Abdulla et al., 2011) as well as of socio-ecological resilience (Adger et al., 2005). Investing in and generating ecological knowledge and translating it into information that can be used in governance are essential (Adger et al., 2005). This requires a better interface between science, policymakers and communities. Investing in research and understanding of vulnerability within mangrove ecosystems and among populations is critical to enhancing resilience (Johnson and Welsh 2010). Regional cooperation in this can help address the challenges of cost and capacity.

Given the regional (and global) nature of the drivers and that many mangrove ecosystems straddle boundaries regional or sub-regional approaches can create a more effective framework for dealing with the challenges.

Policy Option 11: Economic Instruments for Reducing Pollution

Pollution management is important for achieving sustainable environmental approaches across different thematic areas, restoring ecosystems and realizing health goals. Given this it is important for most of the agreed goals

Africa has relied primarily on regulatory - or "command and control" approaches. These approaches influence environmental outcomes by regulating processes or products, limiting the discharge of specified pollutants, and by restricting certain polluting activities to specific times or areas (Bernstein, 1997). Regulatory instruments are often inefficient for achieving most pollution control objectives especially where resources for monitoring are lacking. The level of expenditure required for complying with increasingly stringent environmental laws and regulation is an unmanageable cost for many governments. In contrast, economic instruments have the potential to make pollution control economically advantageous to commercial organisations and to lower pollution abatement costs. They can be applied to a wide range of environmental problems and can involve varying degrees of incentives, information, and administrative capacity for effective implementation and enforcement. The principal types of economic instruments used for controlling pollution include: pricing, pollution charge and, marketable permits (Bernstein, 1997). Where successful applied this can help reduce costs and create by-in across a range of actors.

The case study below illustrates how this approach can be successfully implemented. The case of pollution control in the Olifants is very significant in that it represents a mindset change in pollution management. It is worth replicating in other mining and industrial settings. However, success is dependent on creating a number of enabling conditions: Strong institutional capacity; adequate institutional co-ordination; economic stability; government recognition of novel ideas; and acceptance by polluters to fiscal and incentive mechanisms.

Box 8.15: Managing Acid Mine Drainage in the Olifants Catchment

The upper Olifants catchment, in the Western Cape of South Africa, covers an area of approxiamately 11 464 km^2 (Midgley et al., 1994). Land use is characterized mainly by coal mining, mineral processing and agricultural activities (Hobbs *et al* (2008). Olifants River waters are polluted by acid mine drainage (AMD) from various mining activities including coal.

In addressing the pollution problem, the controlled discharge scheme (CDS) was introduced in the upper Olifants River catchment in 1997 with the support of industrial stakeholders. The Controlled Discharge Scheme takes advantage of the natural assimilative capacity of the upper Olifants River system during high flow conditions to controlled discharge of AMD (Hobbs et al., 2008). The CDS divides the upper Olifants River catchment into management units, each with a distinct waste load allocation based on the available assimilative capacity determined for the unit. During the high flow release period, the waste load allocation and assimilative capacity for each unit is calculated on a daily basis. Participating industries are then allowed to discharge poor quality water to the host management unit in proportion to the assimilative capacity of the unit and each industrial partner's share in the scheme (Limpitlaw et al., 2005)

The CDS has succeeded in meeting its original aim of reducing sulphate concentrations in the Witbank Dam to < 155 mg/L (WCI, 2002). This is an environmental benefit to the river and is envisaged to contribute positively to the biodiversity and ecological integrity of the river in the long run. Significantly, discharge during low flow periods is reduced. Costs are borne by the polluter ensuring that general tax can be put to other uses. Industries in the region (including mines and power stations) made significant capital and operational investments towards this project. Anglo Coal for example invested in excess of R100 million (€9.88 million) in December 2007 in drainage, storage and treatment systems to improve the quality and quantity of its discharges (World Coal Institute, 2002). The risk of uncontrolled discharge has been reduced. The flood risk in workings and constraints on access to reserves have been reduced. A healthier community is envisaged.

It has helped create a new mindset about treating pollution in a water course and responsibility of the polluter. This has been secured by stakeholder involvement and in Olifants River Forum. Enterprises and other stakeholders are more likely to comply with instruments when they understand how they were derived. Cooperation and coordination between the stakeholders also improved significantly.

Policy Option 12: Marine Pollution Management

Marine pollution in Africa is often localised around urban areas, oil producing sites sea transport routes and ports. Africa's marine environment is exposed to many land-based sources of pollution. These include residential effluent, industrial discharges, storm-water run-off, agricultural and mining leaching, contaminated groundwater seepage and waste entering the marine environment from industrial and vehicular exhaust fumes; off-shore exploration and production, especially of oil (GEF et al. 2006). Maritime-derived pollution includes dumping at sea; accidental and intentional oil spills; engine leaks, garbage dumping; and noise (Abdulla and Linden 2008).

Oil spillage and discharge are major challenges, especially around oil producing countries including Libya and Nigeria were problems are severe (Golik et al., 1988, Regional Marine Pollution Emergency Response Centre 2005). On the western coast oil producing companies in the Guinea Current Large Marine Ecosystem (GCLME), which extends from Guinea Bissau to Angola and covers 16 countries, discharge an estimated 4 million tonnes of waste oil yearly into the coastal and

marine environment (GEF et al., 2006). Widespread oil pollution, in the Niger Delta results in ecological, public health and security problems to which women and children are particularly susceptible (Chikwendu 1998 Nwilo and Badejo 2010). Urban growth is an important factor, with growing populations and industrial development in Abidjan driving an increase in pollutants into the Ebrie Lagoon (Guyonnet et al., 2003)., There are also high levels of industrial pollutants from oil refineries, petrochemicals, pharmaceuticals, textiles, leather, food and beverages and plastics in the coastal cities of Accra, Lagos, Doula, Port Harcourt and Luanda (Ibe and Sherman 2002). Maritine transportation is an important driver of pollution. In North Africa, Mediterranean hot spots of tar pollution were identified along the shipping lanes in the waters between Egypt and Cyprus, indicating high use activities in this area (Galdies 2008). The Gulf of Sirte in Libya was found to be the most polluted area in the Mediterranean (Golik *et al*. 1988). It has been suggested that this high spill area originates from the intense activity of the oil terminals on the Libyan coast. It is important to note that at the four main Libyan terminals, namely those in Tripoli, Misurata, Khoms and Zawia, no waste reception facilities are available except for the one in Tripoli, which lacks 'adequate and organized reception and treatment facilities for oily waste' (Regional Marine Pollution Emergency Response Centre 2005). The northeastern side of the continent is high risk of oil pollution (UNEP 2006) because the Red Sea and Gulf of Aden are the world's most important transport route for hydrocarbons, accounting for 11 per cent of the world's seaborne oil transportation (ITOPE 2003). The major shipping routes in the Gulf of Aden also run close to sensitive coral reefs near Eritrea and Djibouti, and ships often discharge oily wastes and sewage, as well as cause physical damage to the reefs (UNEP 2006). The northeastern side of the continent is high risk of oil pollution (UNEP 2006) because the Red Sea and Gulf of Aden are the world's most important transport route for hydrocarbons, accounting for 11 per cent of the world's seaborne oil transportation (ITOPE 2003). This places sensitive coral reefs near Eritrea and Djibouti at risk (UNEP 2006).

Regional conventions addressing marine pollution include:

- The Convention for the Protection of the Mediterranean Sea in 1976 (Barcelona Convention) and which includes seven Regional Protocols that address the various sources of pollution and their management in the Mediterranean including North Africa.
- The Abidjan Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the West and Central African Region's 1981 which includes the Protocol on Cooperation in Combating Pollution in Cases of Emergency;
- The Jeddah Convention of 1982 or the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment includes the Protocol concerning Regional Cooperation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency.
- The Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region of 1985 includes the Protocol Concerning Co-operation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region

Both the Abidjan and Jeddah Conventions and associated Protocols provide important regulatory mechanisms for high use areas and employ a self-regulatory approach. The benefit of self-regulation is that it is quicker and more flexible, and it is sensitive to market circumstances (Osborn and Datta 2006). But the drawback is that the onus is on industry to control pollution (Buckley 1994). The Protocol on Cooperation in Combating Pollution in Cases of Emergency is a useful and important policy for the GCLME given that the sub-region is an emerging player in the global hydrocarbon industry with proven reserves of over 35 billion barrels of oil amounting to three per cent of the global total (Ukwe and Ibe 2010). Innovative waste management systems in Ghana focus on using the waste from one industry as raw material for another. This waste exchange programme was initiated under the GCLME and demonstrates that self-regulation can result in waste reduction and ecosystem recovery (Ukwe and Ibe 2010). The rapid response mechanisms and centers such as REMPEC for North Africa and the Mediterranean take a proactive approach and contribute to building capacity to implement regional protocols.

While international policies are generally self-regulating, some national laws use a hybrid of policies that include taxes, punishment and regulation. For example, Southern Africa does not fall under a UNEP Regional Seas Convention Industrial wastewater disposal policies in South Africa are based on taxes and charges in which wastewater must be licensed for disposal into the marine environment, and that municipal wastewater must be subjected to pre-treatment before disposal into the sea (Taljaard et al 2006). One of the benefits of tax-based policies is that this extends a company's liability for environmental damage. When citizens have standing in the courts they can serve as an important check on industrial practice, as the Ogoni case in the Niger Delta demonstrates (Box 8.13). This in turn influences insurance costs and provisions and provides an incentive for improved environmental performance. A common argument against tax-based policies is that they give the right to pollute if they are not punitive enough.

Policy Option 13: Water Towers

Content related to this section is currently under development, and will be available in Draft 2, which will undergo an external expert peer review process.

3. GOVERNANCE FOR MORE EFFECTIVE POLICY DELIVERY

This section draws on the policy appraisal and identified policy options for each theme and identifies key cross-cutting governance challenges. Based on a review of possible governance solutions it proposes a selection of options.

3.1 Key Challenges

Since the United Nations Conference on Environment and Development (UNCED) in 1992, Africa has made considerable progress in strengthening its environmental governance systems (Kulindwa et al., 2006). However, there remain considerable challenges that are impeding policy success. Five stand out as urgently needing a regional approach if progress to achieving the goals will continue.

1. Over the last ten years the region's development approach has focused strongly on securing growth, with resource extraction becoming increasingly important. Oil production and exploration has emerged as a major factor underlying growth in the fastest growing economics. These development initiatives and a strong emphasis on infrastructure scale-up under the New Partnership for Africa's Development (NEPAD) Short Term Action Plan have brought new environmental challenges. Natural resources are increasingly seen as an engine for growth, for example the waters and hydro-power potential of the Zambezi (World Bank 2010) and oil exploration in Lake Albert, Uganda. This potentially opens up new ecosystems to degradation with adverse impacts on vulnerability as was found to be the case with large dam construction (World Commission on Dams 2002). The critical issue is –given Africa's development priorities–how to make these decisions and implement activities in a way that (1) takes account of environmental considerations and obligations (at national, regional and international levels) and (2) guards against special interests or corruption becoming the driving factor in decision-making. The State of the World's Forest report shows, for example, that that decision-making systems with weak accountability result in forest loss (FAO 2010). Corruption may be a feature of these systems. Such decision-making failure can result in conflict, ecosystem degradation, and resource loss and affect the viability of environmental policies. In the face of climate change avoiding adverse impacts on ecosystems and adaptive capacity will be essential. Africa has achieved significant growth, but inequity remains high

2. Conflicting laws, values and interests within and between countries and at sub-regional levels adversely impact on the ability to develop effective collaborative institutional systems (Mohamed-Katerere 2001). This is a challenge in developing transboundary management systems but also in developing environmental management systems in which there are multiple actors. This has resulted in resource conflicts, including disputes about fair allocation and use of water as disputes. The Botswana-Nambia dispute about the ownership of Sedudu/Kasikili Island in the Chobe –eventually settled by the International Court of Justice in 1996 – illustrates the potential for conflict around water resources (Ashton 2000). The lack of shared standards, for example in biodiversity management, can create challenges in monitoring and implementation of actions to achieve the goals.

3. Inequitable benefit (and loss) sharing from natural resource management at multiple scales (basin, transboundary, national, global, local) can have adverse impacts on social and ecological resilience. Transbounday management, PES such as REDD, co-management and private-public-partnership are among the policy approaches that can suffer from this kind of institutional deficiency. Such inequitable distribution can skew livelihood and economic opportunities through, among other things, the loss of rights or access (Nelson 2010). In these circumstances it is generally vulnerable or marginalized groups or less powerful nations that suffer most (Jaeger et al., 2007). Importantly unfair benefit and loss regimes can add a new dimension to existing tensions and generate conflict as challenges around the 1929 Nile agreement and resource sharing among all basin countries including Kenya, Uganda, Ethiopia shows.

4. Dealing with uncertainty and surprise is an important challenge in achieving the agreed goals. The ecosystems are not static and are constantly going through change in response to human pressures and drivers and other ecological and climate changing. Climate change will amplify these dynamics and this will create new challenges for environmental management but also for addressing poverty and disaster risk reduction.

5. In all areas monitoring and evaluation of policy progress and results is problematic making it difficult to demonstrate policy success. There are multiple underlying factors including insufficient capacity, poor access to financial and knowledge resources, weak systems of accountability and an effort based rather a results based culture. As a result positive outcomes are undercut by environmental leakage (where conservation practice results in a relocation of use) and elite resource capture.

3.2 Governance Options

Several crosscutting governance solutions can be identified that can help improve the likelihood of achieving the agreed policy goals as Table 8.5 shows.

Table 8.5: Which governance solutions address the main governance challenges

	CHALLENGES				
	Special interests/poor environmental decision-making	Conflict in and exclusion from decision-making & management	Inequity in benefit & loss sharing	Monitoring & Evaluation of policy progress	Dealing with uncertainty & surprise
SOLUTIONS					
Accountability measures	**X**	**X**	**X**	**X**	
Strategic EA	**X**		**X**	**X**	
Mainstreaming Environment/ Vulnerability/	**X**	**X**	**X**	**X**	**X**

	CHALLENGES				
	Special interests/poor environmental decision-making	Conflict in and exclusion from decision-making & management	Inequity in benefit & loss sharing	Monitoring & Evaluation of policy progress	Dealing with uncertainty & surprise
DRR in development					
Cooperative & inclusive decision-making (incl. horizontal & vertical institutional integration)	**X**	**X**	**X**		**X**
Sharing responsibility, benefits and losses	**X**	**X**	**X**		
Human Rights approaches	**X**	**X**	**X**	**X**	
Learning and Knowledge sharing	**X**		**X**	**X**	**X**

3.3 Accountability

Best practice demonstrates that effective accountability improves the opportunities for achieving the globally agreed-goals by securing commitment to implementation. Three different aspects of accountability underpin this (Najam and Halle 2010).

First, accountability to mandate – that is whether or not the country, sub-region or region is accomplishing what it is supposed to accomplish – encourages delivery and the revising of strategies. This requires having a baseline from which to measure progress and is qualitatively different from whether or not activities are being taken in pursuit of the goals. Currently COP reports tend to be a list of initiatives focusing on the later. Performance indicators as opposed to effort-based indicators (e.g. number of meetings held) need to be developed and monitored; this improves clarity about how and to what extent the purpose of the policy is being advanced. In the forest sector governments have in conjunction with FAO monitored forest change over many years. This establishes a clear basis for assessing performance and consequently for identifying policies and practices that need to be upscaled, better implemented, or revised. Linking these indicators at forest-level to particular policies and policy change can strengthen understanding of what kinds of policies are most successful.

Strong and effective national and sub-regional reporting systems help hold implementing agencies to account and they provide an opportunity to document successes, which in turn sets the basis for upscaling and replicating. Periodic review as under the Africa Peer Review Mechanism (APRM) could be used to improve performance accountability.

Second, institutional accountability – that is how well environmental policy and implementing agencies are being managed and whether management is fair – helps avoid environmental management being hijacked for personal gain and helps ensure that economic decisions do not run counter to environmental priorities or laws.

Box 8.16: The Africa Peer Review Mechanism

There is growing acknowledgement of the value of the APRM as a tool for improving governance. Some 29 countries that include 75 per cent of the region's population have agreed to submit to this process suggesting perhaps that it could be replicated for or expanded to include environmental governance.

Two case studies (South Africa, Uganda) show that the APRM participation and openness objectives are best achieved where citizens are active and where national laws and institutions support and facilitate inclusion and information access (Corrigan and Gruzd 2010). Environmental education, a vibrant and free media, and access to justice underpin this.

Source: Corrigan and Gruzd 2010

Third, accountability to constituency – that is whether decision-making and implementation institutions are accountable to those in whose names they speak and act – helps ensure fair and equitable outcomes in delivery. Where effectively implemented accountability measures can address power imbalances and ensure that exclusion and skewed distributive systems are avoided (Box 8.17). In addition, it helps ensure a better fit between chosen approaches and sub-regional, national and local realities.

Box 8.17: Strengthening Accountability

A growing body of **successes** demonstrates that accountability measures can improve forest outcomes:

Public accountability helps secure environmental values:
The Government of Uganda abandoned a plan to de-gazette Mabira Forest (2006) in response to public demands for accountability; this ensured that the Forest remained protected as required by the Constitution of the Republic of Uganda, the National Land Act (Cap 227 Laws of Uganda) and the National Forestry and Tree Planting Act, 2003 were not contravened (Odoi 2010).

Secure tenure fosters good conservation practice. Global research demonstrates that protected areas and those where local communities have strong rights are among the best conserved (Sunderlin et al., 2009).

Cooperation between countries can help secure vulnerable resources by curtailing illegal logging, sharing experience, and reducing conflict. Experience with COMIFAC and other collaborative approaches demonstrate that vertical (country to country) integration can encourage accountability to mandate (reference/example). Creating an institutional system – either peer-review or an environmental court can help strengthen these outcomes.

Sources: Odoi 2010, Sunderlin et al., 2009

3.4 Strategic Environmental Assessment: Making Sustainable Choices

Making development choices that do not undermine future options is critical. Decision-making needs to move beyond assessment of environmental impacts to assessing how changes in environmental use and governance impact on resilience (that is the ability of people and nations to respond to the surprise and uncertainty inherent in environmental change). Strategic Environmental Assessment can play a critical role in this by integrating environmental considerations into development policy-making and planning.

As the limitations of project level EIA have become more evident, more African countries have moved to institutionalizing SEA. For example in Mauritius, an EIA conducted on a proposed dam (midlands dam project) demonstrated that project level EIA is not adequate in dealing with broader environmental management issues (Economic Commission of Africa 2005) and the use of SEA and the introduction of Regional Environmental Plans (REP) were recommended to address the cumulative and inter-temporal nature of impacts (Jogoo, 2003). A growing number of countries are using SEA approaches. In South Africa for example, the expansion of SEA has been largely voluntary suggests that it must be adding some value to decision making (Economic Commission of Africa 2005).

Nevertheless, reviews find that the success of SEA is often modest with recommendations only partly considered in decision- making or recognisable in the final decision (Runhaan and Driesen 2007; Aschemann 2004). For example an analysis by Fischer (2002) of 80 SEAs conducted in the Netherlands, UK and Germany in the areas of transport and spatial planning showed that SEA only had a statistically significant impact in transport planning. An analysis of 16 case studies in the Netherlands, UK, the Czech Republic, Slovakia and Estonia (MEGJ/MIRI, 2003) revealed no impact in about a third of the cases, and an impact varying from a bit to a substantial amount in the other two-thirds (Runhaan and Driesen 2007). On the other hand Thérivel and Minas (2002) found that local

decision-makers that used sustainability appraisals for development plans revealed a relatively high impact of SEAs. The appraisals led to changes of about 70 per cent of the plans. Indicators of impact include 'policies changed', 'policies added/removed', and 'new approaches taken to the plan'.

Box 8.18: The growing use of SEA demonstrates integration of environment in diverse areas.

Poverty Reduction
Ghana Poverty Reduction Strategy (GPRS) provided a major opportunity in building the capacity of 110 District Assemblies in sustainability appraisal methods and over 100 officials of 25 ministries, government departments and Agencies in SEA principles and methodologies at the regional and national level (Sampong 2004). Village Infrastructure Project (VIP)
Burkina Faso used SEA to integrate environment–poverty reduction dimensions. Recommendations include the preparation of a monitoring and technical assistance plan, which plan will allow the Ministry of Environment to help the project implementation units of the sectoral investment projects in the implementation, monitoring, and supervision of their respective environmental management plans.

Natural Resource Management
In Guinea, SEA has been used to develop co-management of reserved forests. This facilitated the identification and understanding of environmental issues early in the planning cycle for co-management in these and future target forests. This contributed to environmental improvements thereby avoiding the need for compensatory measures related to adverse impacts.

Integrated Environment-Development Planning
Zambia/Zimbabwe used SEA to plan developments around Victoria Falls. This provided information and made recommendations, which were used to prepare a skeleton management plan for the area and contributed to the overall master plan for the Victoria Falls area.

Inclusion of multiple users/uses
In South Africa, SEA for Stream Flow Reduction Activity (SFRA) resulted in the development of the Negotiation and Decision Support System (NDSS) for the sustainable development of SFRA that acknowledges other water uses (Steyl, 1997). SEA has also been used in Ghana's Regional Water Supply Programmes and in Cameroon's national programme for participatory development

Environmentally-sensitive areas
South Africa: SEA of the Northern Metropolitan Local Council to ensure that environmentally-sensitive areas are protected in the future, and areas that are unsuitable for development identified.

Conflict
South Africa found that using an SEA on Durban South Basin was helpful in resolving the conflict between industrial and local community needs and this led to the preparation of a strategic plan for the area.

Transport and road infrastructure
In Ethiopia's road sector an SEA led to a report containing detailed recommendations to avoid and mitigate against potential environmental impacts of road sector projects and to inform the planning and design process of future road projects.

Irrigation
Morocco used SEA to provide an analysis of legal, regulatory and institutional aspects of environmental impacts in the large-scale irrigation sector and consequently made recommendations addressing environmental protection and public health sector enhancement.

In Ethiopia SEA was used to environmental improvements in the design of small-scale irrigation, thereby avoiding the need to mitigate or compensate for adverse impacts.

Source: Economic Commission of Africa 2005

Existing experience shows that the context of decision-making is critical in determining the success of SEA. Timing, public participation and credibility of policy analysis stand out as important. The following factor are also found to be important for success (Runhaan and Driesden): Flexible SEA that fits decision-making context; Transparency of SEA process; Binding character; Quality of assessment; Values in SEA reflect values in policy context; Openness of decision makers to environment and sustainability; Tiering of SEA with other assessments; Adequate resources; Effective communication; and assessment and mitigation of redistributional effects

At regional level one option is to standardize approaches through AMCEN and agree to substantive and procedural SEA principles

3.5 Mainstreaming Environment & Vulnerability in Development

Cooperative and inclusive decision-making

Developing mutually reinforcing systems requires looking up as well as down the hierarchy. Improving engagement between actors at inter-state and regional level and among those at national level is essential for making difficult tradeoffs and ensuring commitment to proposed solutions.

Cooperative and inclusive decision-making processes at multiple levels, as the policy appraisal has shown, can be effective in reducing conflict, ensuring fairer more equitable sharing of benefits of shared resources among nations and within nations (Policy Options 1, 2, and 7). Existing cooperative governance between states that is inclusive of multiple stakeholders can complement national environmental initiatives and enhance outcomes in peace-building, more effective conservation, disaster risk reduction, adaptation, and development by building trust, synchronizing conservation and development objectives, strengthening knowledge, and pooling resources as shown in Policy Options 1 and 2.

Enhancing cooperation between sectors is also important. One challenge is institutional multiplicity. Multiple processes, rules and policies exist, from regional level (e.g. the African Ministerial Council on Water), sub-regional (e.g. basin specific initiatives) to national level. Strengthening performance requires harmonizing approaches so that they are mutually reinforcing and conflicting mandates or objectives are avoided.

3.6 Knowledge and skills sharing

The foregoing policy appraisal shows that environmental policy is not always keeping pace with realities on the ground. For example REDD and biodiversity offsets are not always able to ensure social by-in. In other cases environmental solutions do not match the scale of the problem, neglecting for example drivers of environmental change that lie outside of the thematic area or across boundaries, as in the marine area. While in others the interface between different ecosystems as well as people is neglected. The role and function of mangrove ecosystems for sustainable land management, for retaining marine biodiversity and for adaptation and disaster risk reduction has been neglected. The lack of shared perspectives about the nature and scale of the problem (Patt and Shroeter 2008, Box 8.14) as experienced in adaptation in Tanzania shows can undercut effective implementation of chosen solutions. These examples illustrate that it is critical to strengthen social learning and its interface with choice making.

Financial and skill constraints reduce opportunity for knowledge development in many African nations. As experience of regional early warning systems – IGADs Conflict Early Warning and Response Mechanism and SADC's Drought Monitoring Centre - demonstrates sharing information and pooling resources can strengthen learning and response to environment change and extreme events. These experiences can be replicated (CEWARN 2006, Ame 2006). However these systems often fail to bring in local knowledge and understanding. Facilitating inter-actor dialogues within and among levels can enhance understanding and encourage the sharing of knowledge around

environmental hazards and risks, support the exchange of best management practice, enhance adaptation, reduce conflict and importantly support resilience-enhancing choices. Where knowledge sharing has been integrated into transboundary natural resource management, as in the Great Lakes Region, inter-actor dialogues including farmers, park and military authorities, and environmental expert have been instrumental in reducing conflict (Besancon and Hamill 2006).[5]

3.7 Sharing responsibility, benefits and loss

Over the last 20 years there has been a steady increase in the number of environmental solutions in which external actors have significant roles in shaping environmental choices and management. This includes an increase in public private partnerships, land "investments" (World Bank 2009, Oxfam, CIRAD, CDE and ILC 2011) and PES approaches including clean development mechanism projects biodiversity offsets and REDD (Policy Option 3, 4). With the growing focus on "economic solutions", these are likely to increase. While the intention of these initiatives has been to create an economic incentive to conserve, strengthen private responsibility, and deliver social benefits – the reality has often been different (See Box 8.5). When PES agreements are not entirely voluntary, social benefits are often insufficient to secure complete support (Wunder 2005). The history of conflict around and intrusion into protected areas and other state conservation initiatives in Africa reinforces these conclusions (Hulme and Murphree 2001). Growing evidence on land investments show that these investments are often negotiated in ways that neglect local rights and often do not deliver the benefits agreed (Cotula 2011). Three complementary and reinforcing options could be considered:

First, developing and adopting protocols and codes for cooperation and sharing can provide the basis for effective engagement and managing benefits and loss. For example the SADC Protocol for Shared Water resources encourages fairer benefit sharing regimes. Similar approaches could be used for defining rights and responsibilities of buyers/investors and users/custodians in natural resources. This could include for example agreeing to an approach to Free Prior Informed Consent. In the REDD sector the approach is currently defined by the driving agency either the World Banks or UN-REDD. The World Bank approach recognizes the importance of consultation but does require consent, whereas the UN-REDD approach is linked to the rights envisaged under the UNDRIP. Strengthening region wide understanding about the implications of each for social-ecological resilience could be an important first step in deciding on appropriate standards not only for REDD but other natural resource investments. Agreeing to region-wide principles, and supporting and encouraging a globally-agreed charter on natural resource investments and acquisitions could help shift these approaches to greater social-environmental sustainability.

Second, strengthening and integrating human rights perspectives in environmental management frameworks at national level, also supports more inclusive, long-term approaches that do not reduce opportunities, by for example fuelling conflict (Mohamed-Katerere 2009) and that protect the conditions for social resilience. Regional cooperation around such initiatives can help reduce costs for individual nations and create opportunities for sharing information.

Policies that encourage the private sector to assume corporate social responsibility can be an important step in reducing adverse social and environmental outcomes. Corporate Social Responsibility (CSR) needs to not only result in more realistic valuation of environmental services and goods but needs to address livelihood opportunities foregone and non-financial impacts.[6]

3.8 Strengthen Regional Human Rights Architecture

The policy appraisal shows that environmental performance can be improved by strengthening human rights approaches that empower natural resource custodians and strengthen accountability. There is broad agreement that environmental accountability rests on strengthening "good governance" rights of

[5] Additional case study on inter-actor agricultural dialogue in West Africa will be made available in Draft 2.
[6] Additional case study on CSR in Zimbabwe will be made available in Draft 2.

access to information, transparency, and rights of participation (Campese et al., 2009, Kravchenko and Bonine 2008). Evidence of this approach can be found in The Rio Declaration as well as other environmental conventions, such as the Convention on Biological Diversity.

Effective environmental and human rights relies not only on recognition of these rights, but also on ensuring that rights-holders can claim and protect these rights. Regional and global institutions can play an important role in enhancing opportunities including the mandate of regional courts. The African Charter already recognizes a right to a clean environment, however ancillary rights are less clearly provided for. The African Commission on Human and Peoples' Rights is currently the main human rights monitoring body, however its work has been limited by state reluctance to give effect to its decisions reducing its effectiveness in protected human rights and its quasi judicial standing (Wachira 2008). Nevertheless there is a region-wide interest in strengthening the Commissions work. In 2008, the AU decided to increase the budgetary allocation to the African Commission on Human and Peoples Rights by over 400 per cent in order to ensure that the Commission ended its dependency on erratic donor funding (Wachira 2008) The Africa Court for Human and People's Rights, established in 1998, was designed to complement this role but is poorly utilized and since its inception has made only two judgements (www.african-court.org), with issues of standing being a critical limitation. Mali and Burkina Faso – have granted individuals and NGOs direct access to the Court (Wachira 2008). Addressing these and other challenges can help strength the role of the Court and the Commission in securing good environmental management.

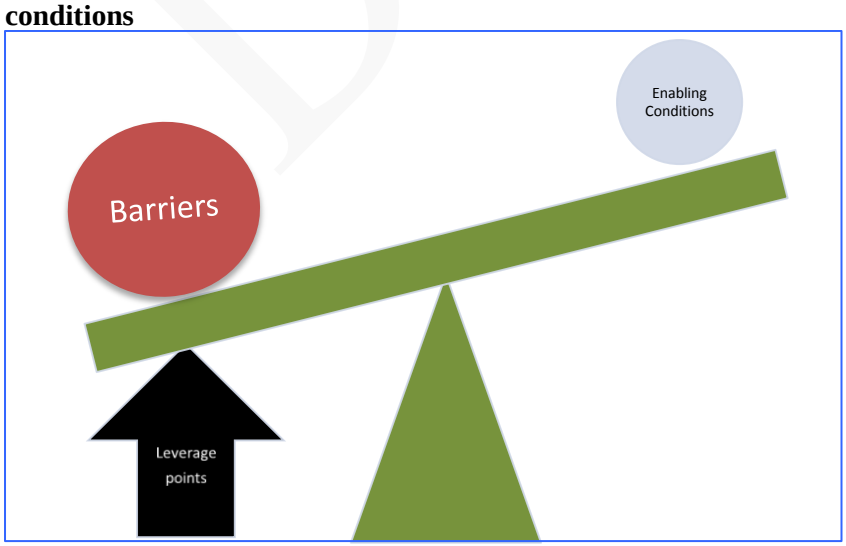
3.9 Eco-budgeting

Content related to this section is currently under development, and will be available in Draft 2, which will undergo an external expert peer review process.

4. CONDITIONS FOR REPLICATION & UPSCALING

The environmental policy appraisal and governance analysis suggests that despite growing policy success, there are continued challenges in defining appropriate approaches for effective implementation – these include environmental management as well as governance practice. Reducing or removing barriers and strengthening enabling conditions are critical for success and to move Africa along a trajectory of effective environmental response from "problem recognition" to "problem solving."

Figure 8.7: Identifying "leverage points" can change the balance between barriers and enabling conditions



Identifying "leverage" points to create more favourable conditions for and outcomes in environmental decision-making, environmental management, economic space/climate, and livelihoods and well-being can direct governments to look more holistically at solutions. If utilized leverage points can tip the scale in favour of implementation and enhance progress to the achievement of the goals and set in motion transformative change (Table 8.6).

Table 8.6: Achieving the Goals and moving to transformative change

	LEVERAGE POINTS	OPTIONS FOR ACTION
ENVIRONMENTAL DECISION MAKING	Take into account links between social-economic-political environmental domains as well as among environmental sectors	Strategic Environmental Assessment (1)
		Integrate Environment-Development (2)
		Recognize an environmental human right (3)
		Strengthen Human Rights institutions (4)
		Take an Ecosystem Based Approach (5)
	Strengthen Accountability	3, 4, Recognize good governance human rights (6)
		Improve monitoring, evaluation and reporting (7)
	Improve social learning	Support multi-actor dialogues at diverse levels (8) to building on knowledge, lessons and shared experience Support research and learning that demonstrates the value of sound environmental policy (8a)
	Include all relevant actors	Adopt collaborative approaches including TBNRM and MPA (9) Support community based management (10) Build public-private partnerships (11)
ENVIRONMENTAL MANAGEMENT	Improve monitoring & evaluation	Capacity building (12)
		Develop and implement credible low-cost methodologies and information management systems to measure and verify ecosystem service provision (13)
		Share resources and skills (14)
	Strengthen Accountability	3, 4, 5, 8
		9, 10, 11
	Encourage long term perspectives	Develop appropriate land tenure institutions (15) Accelerate efforts to grant clear property rights to land and natural resources to rural individual and community land custodians (16)
		10, 8a
	Reduce management conflict	Harmonize legislative framework for key policies at national, regional and global levels
SOCIAL RESILIENCE	Ensure fair and equitable sharing of benefits	Develop principles for sharing of key natural resources
		4, 9, 10, 11
	Enable and facilitate environmental custodian and pro-poor participation in PES	Revise eligibility criteria
		Develop region-wide PES guidelines and encourage development of global guides (17)
		15, 16
		Integrate ecosystem service management issues and PES into agricultural and forest extension
		4
	Knowledge exchange	
BUSINESS SPACE	Reduce barriers to business	Address corruption and Bureaucracy
	Environmental cooperate responsibility	17

Given the scale and nature of the problem it is evident that solutions cannot be piecemeal but will need to cut across and strengthen linkages among different environmental sectors as well as between environment, social and economic domains. A mix of policy options that create meaningful levers for change are more likely to support effective implementation of existing policies and achievement of the goals. Achieving these goals will require holistic and crosscutting approaches as they are closely interlinked.

Policy success requires that policies should not be blindly replicated, but that policies are modified to achieve good fit between policy and local/national/regional conditions. Ensuring this requires adapting policies and ongoing learning. Effective monitoring and evaluation of results can support purposeful modification and re-designed to address shortcomings and unintended, adverse consequences. At the same time, given that the mix of pressures on the environment and drivers of environmental change include exogenous (such as climate change) and endogenous (such as population growth) factors, solutions will need to go beyond technical (Swatuk et al., 2009). Policies that breaking with dominant mindsets can help encourage fundamental transitions in finding solutions will be needed (Meadows X).

The policy appraisal shows that the management of ecosystems can include a variety of strategies and approaches at different scales, local to regional to global. It is important that any management approach is chosen based on its ability to support the health and maintain an entire ecosystem, the services it provides, as well as the cultural, social and legal context where it will be applied – an ecosystem-based approach. Strategies should not favor just one ecosystem component, industry sector, community, or socioeconomic group (Davis et al., 2011). While the management approaches appraised here, such as ICZM, MPA, SLM and TBNRM plans may not represent complete full-fledged EBM in themselves; they provide an important step toward EBM by building institutional and legal frameworks and regional capacity for entire ecosystem management.

There are continued challenges in attributing these positive outcomes to policies as many other factors contribute to success/failure. In part this is because there remains a lack of reliable studies showing the profitability of investment in the sustainable management of environment. Investing in generating and sharing this knowledge can encourage countries to allocate more resources to the environmental sector. This will support better integration among sectors and mainstreaming of the environment and environmental policies/strategies into development plans.

5. CONCLUSION: CONSEQUENCES OF (IN) ACTION

Content related to this section is currently under development, and will be available in Draft 2, which will undergo an external expert peer review process.

REFERENCES

Abdulla, A., Game, E., Grimsditch, G., Obura, D., Purkis, S., Rowlands, G., and Rouphael, T., (2011). Integrating resilience to climate change into Marine Spatial Planning. UNEP Marine and Coastal division series

Abdulla, A., Gomei, M., Hyrenbach, D., Notarbartolo-di-Sciara, G., and Agardy, T. (2009). Challenges facing a network of representative marine protected areas in the Mediterranean: prioritizing the protection of underrepresented habitats. *ICES Journal of Marine Science*, 66: 22-28.

Adger, W.N., Huges, T.P., Folke, C., Carpenter, S.R. and J. Rockstrom **(**2005). Social- ecological resilience to coastal diasters. *Science 309: 1036 – 1039*

Ajonina, G., Abdoulaye, D. and Kairo, J. (2008). Current status and conservation of mangroves in Africa: An overview. **WRM Bulletin** 133, August 2008 http://wrmbulletin.wordpress.com/2008/08/25/current-status-and-conservation-of- mangroves-in-africa-an-overview/

Ajonina1, G., Tchikangwa, B., Chuyong, G. and Tchamba, M. (2009). The challenges and prospects of developing a community based generalizable method to assess mangrove ecosystems vulnerability and adaptation to climate change impacts: Experience from Cameroon. . In **The relevance of mangrove forests to African fisheries, wildlife and water resources**. ***Nature and Faune***. Vol 24, pp 16 -25. Bojang, F and A.Ndeso-Atanga (Eds)(2009). Food and Agriculture Organization of the United Nations Accra, Ghana. ftp://ftp.fao.org/docrep/fao/012/ak995e/ak995e00.pdf

Alden Wily, L. (2007). So Who Owns the Forest?: An Investigation into Forest Ownership and Customary Land Rights in Liberia. Monrovia, Liberia: The Sustainable development Institute. Brussels: FeRn. p24-25

Altman, S., C. Benjamin, S.S. Nichols and B. Thiam (2009) Community Forestry. A cornerstone of peace and security in West Africa. In *Natural Resource Governance and Human Security in Africa. Emerging issues and trends*. (Eds Kesselman, Hughes, Kabemba, Matose and Rocha) Pax-Africa, Johannesburg

Ali, O. M. (1991). An ecological assessment of the Nile System in the Sudan over the last thirty years. J. of Nile Geographer. (1): 1-9.

Ambatovy Project (2009). Business and biodiversity offsets program (BBOP) pilot project case study. The Ambatovy project, Antananarivo. www.forest-trends.org/biodiversityoffsetprogram/guidelines/ambatovycase-study.pdf

Ame 2006 (To be completed)

Andrews, G. (1998). *Mafia Island Marine Park, Tanzania: Implications of Applying a Marine Park Paradigm in a Developing Country*. ITMEMS 1998 Proceedings

Armah, A.K., Diame, A., Ajonina, G. and Kairo, J. (2009). The role and work of African Mangrove Network (AMN) in conservation and sustainable use of mangroves in Africa. In **The relevance of mangrove forests to African fisheries, wildlife and water resources**. ***Nature and Faune***. Vol 24, pp Bojang, F and A.Ndeso-Atanga (Eds)(2009). Food and Agriculture Organization of the United Nations Accra, Ghana. ftp://ftp.fao.org/docrep/fao/012/ak995e/ak995e00.pdf

Arthurton, R. and K. Korateng (2006). Coastal and Marine Environments. In Africa Environment Outlook 2. Our Environment Our Wealth. UNEP, Nairobi

Aschemann 2004 (To be completed)

Ashton, P. (2000) Southern African Water Conflicts: Are they inevitable or preventable? In: Green Cross International,. 2000, Water for peace in the Middle East and Southern Africa. Green Cross International, Geneva; pp.94-98

Atsegbua, L., (2001). 'Environmental Rights, Pipeline Vandalisation and Conflict Resolution in Nigeria'. IELTR 89-92.

Awulachew, S., Rebelo, L. and Molden, D. 2010. The Nile Basin: Tapping the unmet agricultural potential of the Nile waters. Water International Journal, Vol 35 (5): 623-654.

Banana, A. Y.and W. G. Ssembajjwe. (2000). Successful Forestry Management: The Importance of Security of Tenure and Rule enforcement in Ugandan Forests. In G. Clark, M. Mckean and E. Ostrom, eds. 2000. People and Forests: Communities, Institutions, and Governance. Cambridge: MIT Press.

Barrow, E., Clarke, J., Grundy, I., Kamugisha-Ruhombe, J. & Y. Tessema (2002). Analysis of stakeholder power and responsibilities in community involvement in forestry management in Eastern and Southern Africa, IUCN.

Behran et al., 2011 (p6) (To be completed)

Bernstein, 1997 29 (To be completed)

Besançon, C. and A. Hamill (2006). Promoting Conflict Sensitivity in Transboundary Protected Areas. PCIA Virunga-Bwindi Region. Report of Activities. In Regional Meeting, December 2005, Goma, Democratic Republic of Congo. http://www.earthlore.ca/clients/WPC/English/grfx/ sessions/PDFs/session_2/Hammill.pdf).

Billè, R. (2008). Integrated Coastal Zone Management: four entrenched illusions. *S.A.P.I.E.N.S* 1(2)

Billè, R. and Rochette. 2010. Feasibility Assessment of an ICZM Protocol to the Nairobi Convention. Regional Programme for the Sustainable Management of the Coastal Zone of the Countries of the Indian Ocean.

Blomley, R., Nelson, F., Martin, A. and M. Ngobo (2007) Community Conserved Areas: A review of status and needs in selected countries of central and eastern Africa http://cmsdata.iucn.org/downloads/east_central_africa_cca_study.pdf

Blomley T. & S. Iddi (2009). Participatory Forest Management in Tanzania: 1993 – 2009 Lessons learned and experiences to date.

Bode, M., Wilson, K.A., Brooks, T.M., Turner, W.R., Mittermeier, R.A., McBride, M.F., Underwood, .E.C. and Possingham, H.P. (2008). Cost-effective global conservation spending is robust to taxonomic group. Proceedings of the National Academy of Sciences of the United States of America.

Boisrobert, C. and Virdin, J. (2008). 'The importance of Africa's coastal and marine ecosystems', *Environmental Matters Annual Review*, July 2007 – June 2008.

Bongers F., Wassie A., Sterck, F.J., Bekele T. and Teketay, D. (2006). Ecological restoration and church forests in northern Ethiopia. *Journal of the Drylands 1(1): 35-44, 2006*

Borrini-Feyerabend 2010 Personal communication, Gland

Brouwer, R., Nhassengo, J., 2006. About bridges and bonds: community responses to the 2000 floods in Mabalane, Mozambique. Disasters 30 (2), 234–255.

Brown, S., Kebede, A.S. and Nicholls, R.J. (2009). *Sea-Level Rise and Impacts in Africa 2000 – 2100*. University of Southampton, Southampton

Brunne, J. and Toope, S. 2003. The Nile Basin Regime: A Role For law? A. Alsharhan and W. Wood (Eds), Water resources perspectives: Evaluation, Management and Policy. *Elsevier Science*, the Netherlands. P. 93-117.

Buckley R. Environmental self-regulation in industry. Environment and Planning Law Journal 1994:11(1):3–5.

Campese, J., T.Sunderland, T.Greiber and G. Oviedo (2009). Rights-based Approaches. Exploring Issues and Opportunities for Conservation. IUCN, Gland and CIFOR, Bogor

Capoor, K. and P. Ambrosi (2008) State and Trends of Carbon Market: A Focus on Africa. World Bank, Washington D.C.

Carrere, R. (2009) African mangroves: their importance for people and biodiversity. In **The relevance of mangrove forests to African fisheries, wildlife and water resources**. ***Nature and Faune***. Vol 24, pp3-7.Bojang, F and A.Ndeso-Atanga (Eds)(2009). Food and Agriculture Organization of the United Nations Accra, Ghana. ftp://ftp.fao.org/docrep/fao/012/ak995e/ak995e00.pdf

Chape, S J Harrison, M Spalding and I Lysenko Measuring the extent and effectiveness of protected areas as an indicator for meeting global biodiversity target *Phil. Trans. R. Soc. B* 2005 360, 443-455 doi: 10.1098/rstb.2004.1592

Chape, S. Spalding, M. Jenkins, S., UNEP-WCMC□Volume: 2008□World Protected Areas. Status value and prospects. UNEP-WCMC

Chikwendu 1998 30 (To be completed)

CI 2011 p 15 (To be completed)

CIRAD 2011 (p5) (To be completed)

CDE 2011 (p5) (To be completed)

CEWARN (2006). The Conflict Early Warning and Response Mechanism in the Intergovernmental Authority on Development. Intergovernmental Authority on Development. http://www.cewarn.org

Conca, K and G.D.Dabelko (2002). The Problems and Possibilities of Environmental Peacemaking. In **Environmental Peacemaking** (Eds Conca and Dabelko). Woodrow Wilson Institute, Washington D.C.

Convention on Biodiversity Secretariat (2010) Global Biodiversity Outlook. CBD

Cotula, L. (2011). Land Deals in Africa. Whats in the Contracts? IIED, London

Cotula, L., N. Dyer, and S. Vermeulen (2008). Fuelling Exclusion: The biofuels boom and poor people's access to land. The Food and Agriculture Organization of the United Nations, Rome and the International Institute for Environment and Development , London

Corrigan and Gruzd 2010, 34 (To be completed)

Cowling, R. M., Pressey, R. L., Rouget, M. and Lombard, A.T. (2003). A conservation plan for a global biodiversity hotspot - the Cape Floristic Region, South Africa. Biological Conservation **112**:191-216.

CPSU (2002). The Miner's Canary: Indigenous Peoples and Sustainable Development in the Commonwealth. CPSU, London.

CPSU (2002). The Miner's Canary: Indigenous Peoples and Sustainable Development in the Commonwealth. CPSU, London.

Crooks, S., D. Herr, J. Tamelander, D. Laffoley, and J. Vandever. (2011). "Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shore Marine Ecosystems: Challenges and Opportunities." Environment Department Paper 121, World Bank, Washington, DC.

Daley and Mokoro 2011(p6) (To be completed)

Da Via (To be completed)

Davis, G. E. (2005). Science and Society: Marine Reserve Design for the California Channel Islands. Conservation Biology **19**:1745-1751.

Davis, J., Agardy, T. and Sherwood, K. (2011). Taking Steps toward Marine and Coastal Ecosystem-Based Management - An Introductory Guide. UNEP Marine and Coastal Division. Available at www.unep.org/ecosystemmanagement

de Bruyn, P. A., Moloney, C. L., and Schleyer, M. H. 2009. Application of age-structured production models to assess oyster *Striostrea margaritacea* populations managed by rotational harvesting in KwaZulu-Natal, South Africa. – ICES Journal of Marine Science, 66: 408–419.

Defries, R; Hansen, A.; Turner, B.L., Reid, R AND Liu, J (2007). Land use change around protected areas: Management to Balance Human Needs and ecological function. **Ecological Applications**, 17(4), 2007, pp. 1031–1038 Ó 2007 by the Ecological Society of America

DEAT (2011). *Working for the Environment*. Department of Environmental Affairs and Tourism, Pretoria.

Dillaha et al., 2011 (p12) (To be completed)

Duke N.C., Meynecke J.O., Dittmann S., Ellison A. M., Anger K., Berger U., Cannicci S., Diele K., Ewel K.C., Field C.D., Koedam N., Lee S.Y., Marchand C., Nordhaus I. and F. Dahdouh-Guebas. (2007). A World Without Mangroves? *Science 317: 41 – 42*

Dudley, N., Higgins-Zogib,L. S. Mansourian. 2005. Beyond Belief: Linking Faiths and Protected Areas to Support Biodiversity Conservation. World Wide Fund for Nature, Gland

DWAF (2002a). *Free Basic Water. Tap into life. Regulations & guidelines*, Department of Water Affairs and Forestry, Directorate: Interventions and Operations Support, Pretoria.

DWAF (2002b). *Free Basic Water. Tap into life. Prepayment Water Meters and Management Systems*, Department of Water Affairs and Forestry, Directorate: Interventions and Operations Support, Pretoria.

DWAF (2002c). *Free Basic Water. Tap into life. Questions & answers*, Department of Water Affairs and Forestry, Directorate: Interventions and Operations Support, Pretoria.

DWAF (2002d). *Free Basic Water. Tap into life. Control devices guidelines summary*, Restor Ltd., Pietersmaritzburg.

DWAF (2002e). *Free Basic Water. Tap into life. Implementation strategy: version 2*, Department of Water Affairs and Forestry, Directorate: Interventions and Operations Support, Pretoria.

DWAF (2002f). *Free Basic Water. Tap into life. Rural areas: fbw implementation strategy and guidelines*, Department of Water and Forestry, August 2002, Pietermaritzburg.

Earthlife Africa v Department of Environmental Affairs and Tourism and Eskom Holdings, 2005

Economic Commission of Africa (2005). Review of the Application of Environmental Impact Assessment in Selected African Countries. Economic Commission of Africa, Addis Ababa

Ernoul, L. (2010) Combining process and output indicators to evaluate participation and sustainability in integrated coastal zone management projects. *Ocean & Coastal Management* 53: 711-716.

Ervin, J., N. Sekhran, A. Dinu. S. Gidda, M. Vergeichik and J. Mee. 2010. Protected Areas for the 21st Century: Lessons from UNDP/GEF's Portfolio. New York: United Nations Development Programme and Montreal: Convention on Biological Diversity.

FAO (2007). The world's mangroves 1980-2005, Food and Agriculture Organization of the United Nations Rome http://www.fao.org/docrep/010/a1427e/a1427e00.htm

FAO (2010) Global Forest Resources Assessment. Food and Agriculture Organization of the United

Nations Rome

FAO (2011) State of the Worlds Forests. Food and Agriculture Organization of the United Nations Rome

Fairbain 2011, (To be completed)

Fernandes, L., Day, J., Lewis, A., Slegers, S., Kerrigan, B., Breen, D., Cameron, D., Jago, B., Hall, J., Lowe, D., Innes, J., Tanzer, J., Chadwick, V., Thompson, L., Gorman, K., Simmons, M., Barnett, B., Sampson, K., De'ath, G., Mapstone, B., Marsh, H., Possingham, ., Ball, I., Ward, T., Dobbs, K., Aumend, J., Slater, D., and Stapleton, K. (2005). Establishing representative no-take areas in the Great Barrier Reef: Large-scale implementation of theory on marine protected areas. Conservation Biology **19**:1733-1744.

Fischer, T B 2002. *Strategic Environmental Assessment in Transport and Land Use Planning*. London: Earthscan

Frynas, J.G. (1999). 'Legal Change in Africa: Evidence from Oil related Litigation in Nigeria.' *Journal of African Law*, Vol. 43, 121-150.

Game, E. T., Watts, M., Wooldridge, S. and Possingham, H. (2008). Planning for persistence in marine reserves: a question of catastrophic importance. Ecological Applications **18**:670-680.

ISDR (2011) Global Assessment Report. International Strategy for Disaster Risk Reduction

GEF/UNIDO/UNDP/UNEP/US-NOAA/NEPAD. (2006). The transboundary diagnostic analysis for the Guinea Current Large Marine Ecosystem. IGCC, Accra.

Gonzàlez-Riancho, P., Sanò, M., Medina, R., Garcià-Aguilar, O., and Areizaga, J. 2009. A contribution to the implementation of ICZM in the Mediterranean developing countries. *Ocean & Coastal Management* 52: 545-558.

Gordon, C., Tweneboah, E., Mensah, A.M. and Ayivor, J.S. (2009). The Application of the Ecosystem Approach to Mangrove management: Lessons for Ghana. In **The relevance of mangrove forests to African fisheries, wildlife and water resources**. ***Nature and Faune***. Vol 24, pp 16 -25. Bojang, F and A.Ndeso-Atanga (Eds)(2009). Food and Agriculture Organization of the United Nations Accra, Ghana. ftp://ftp.fao.org/docrep/fao/012/ak995e/ak995e00.pdf

Gordon, I. & W. Ayiemba (2003). Harnessing butterfly biodiversity for improving livelihoods and forest conservation: The Kipepeo Project. The *Journal of Environment & Development 12:82* (DOI: 10.1177/1070496502250439).

Grace, J., Ryan, C.M., Williams, M., Powell, P., Goodman, L. and R. Tipper (2010) A pilot project to store carbon as biomass in African woodlands.Carbon Management (2010) 1(2), 227–235

Gustavson, K., Kroeker, Z., Walmsley, J. and Juma, S. (2008). A process framework for coastal zone management in Tanzania. *Ocean & Coastal Management* 52:78-88.

Guyonnet et al., 2003 30 (To be completed)

Hakimzumwami, E. (2000). Community wildlife management in Central Africa - a regional review. IIED, London.

Hammill, A. (2006). Protected Areas and the Security Community. In Friends for Life: New Partners in Support of Protected Areas (ed. J. McNeely). IUCN, Gland

Hatziolos, M. E. 1997. A World Bank framework for ICZM with special emphasis on Africa. *Ocean & Coastal Management* 37 (3): 281-294.

Hewawasam, I. 2000. Advancing knowledge: A key element of the World Bank's integrated coastal management strategic agenda in Sub-Saharan Africa. *Ocean & Coastal Management* 43: 361-377.

Hilhorst 2011, (To be completed)

Hob, H., Oelofse, S.H. and Rascher, J. 2008. Management of Environmental Impact from Coal Mining in the Upper Olifants River Catchment as a Function of Age and Scale. International Journal of water resources Development. Vol. 24 (30: 417-431.)

http://www.unhabitat.org/pmss/getPage.asp?page=bookView&book=2562

Human Rights Council Social Forum (2010) The Report of the Social Forum 2010, A/HRC/16/62 0 26. submitted

Hulme, D. and Murphree, M. (eds.) (2001) African Wildlife and Livelihoods: The promise and performance of community conservation. James Curry, Oxfor Ibe, A.C, and Sherman K. (2002). The gulf of Guinea Large Marine Ecosystem project: turning challenges into achievements. In: MacGlade JM, Cury P, Koranteng KA, Hardman-Mountford NJ, editors. The Gulf of Guinea large marine ecosystem: environmental forcing and sustainable development of marine resources. Amsterdam: Elsevier Science; 2002. p. 27-39.

ICMM 2010 (p12) (To be completed)

IUCN 2003 2003 (p9) (To be completed)

International Council on Human Rights Policy. (2008). Climate Change and Human Rights: A Rough Guide International Council on Human Rights Policy. Versoix, Switzerland.

Johannes 1998 (p10) (To be completed)

Johnson, J. and D. J. Welch (2010) Marine Fisheries Management in a Changing Climate: A Review of Vulnerability and Future Options Reviews in Fisheries Science, 18(1):106–124, 2010

Jäger, J., M. Kok, J.C. Mohamed Katerere, S. Karlsson, M. Lüdeke, G.D. Dabelko, F. Thomalla, I.de Soysa, M. Chenje, R. Filcak, L.Koshy, M. Long Martello, V. Mathur, A.R. Moreno, V. Narain, and D. Sietz (2007). Vulnerability of People and the Environment: Challenges and Opportunities. In Global Environment Outlook 4: Environment for Development, United Nations Environment Programme, Nairobi

Jogoo, 2003 35 (To be completed)

Karibuhoye and Ducrocq 2008 (p10) (To be completed)

Katoomba Group 2006 (12) (To be completed)

Katerere, Y. and Mohamed-Katerere, J.C. (2005). From Poverty to Prosperity: Harnessing the Wealth of Africa's Forests. In Forests in the Global Balance – Changing Paradigms, Mery, G., Alfaro, R., Kanninen, M. and Lobovikov, M. (eds.). IUFRO World Series Vol. 17. International Union of Forest Research Organizations, Helsinki

Keen M, Brown V A, Dyball R 2005. Social learning: a new approach to environmental management. In: Social learning in environmental management. Earthscan Press, UK, USA. Pp. 1–21

Kidd, M. (2009). "South Africa: The Development of Water Law." In *The Evolution of the Law and Politics of Water*, by Joseph W. Dellapenna and Joyeeta Gupta, 87-104. New York: Springer

Koech et al., 2009 pp 22 (To be completed)

Kokoro-Owo v. Lagos State Government (1995) 6 NWLR 760 at 765.

Knight 2010/FAO 26 (To be completed)

Kravchenko, S. and J.E. Bovine (2008). Human Rights and the Envoronment. Cases, Law and Policy. Carolina Academic Press

Kulindwa, K., Kameri-Mbote, P., Mohamed-Katerere, J.C. and M. Chenje (2006) The Human Dimension. In Africa Environment Outlook 2. Our Environment Our Wealth. UNEP, Nairobi

Landell-Mills, N., and I. T. Porras. 2002. *Silver bullet or fool's gold? A global review of markets for forest environmental services and their impact on the poor.* International Institute for Environment and Development, London, UK.

Larson, Elizabeth A. (2010). At the intersection of neoliberal development, scarce resources, and human rights: Enforcing the right to water in South Africa" (2010). Honors Projects. Paper 10. http://digitalcommons.macalester.edu/intlstudies_honors/10

Lau, W. Submitted. Beyond Carbon: Conceptualizing Payments for Ecosystem Services in Blue Forests on Carbon and Other Marine and Coastal Ecosystem Services. *Oceans and Coastal Management.*

Lau, W. Agardy, T., and Hume, A. (2010). Payments for Ecosystem Services: Getting Started in Marine and Coastal Ecosystems: A Primer Forest Trends and The Katoomba Group

Lee, C., and T. Schaaf, eds. 2003. The Importance of Sacred Natural Sites for biodiversity Conservation. (Proceedings of an international workshop, Kunming, China, February 2003.) UNESCO, Paris.

Limpitlaw, D. ; MM. Aken, H. Lodewijks & J. Viljoen (2005) Post-mining rehabilitation, land use and pollution at collieries in South Africa, Presented at the Colloquium: *Sustainable Development in the Life of Coal Mining*, South African Institute of Mining and Metallurgy, Boksburg, 13 July, 10 pp12.

Locher 2011 26 (To be completed)

Idowu, A.A. (1999). 'Human Rights, Environmental Degradation and Oil Multinational Companies in Nigeria: The Ogoniland Episode' (1999) *Netherlands Quarterly of Human Rights*, Vol. 17/2, 161-184.

Larson, E.A. (2010). At the intersection of neoliberal development, scarce resources, and human rights: Enforcing the right to water in South Africa" (2010). Honors Projects. Paper 10. http://digitalcommons.macalester.edu/intlstudies_honors/10

MA (2003). Millennium Ecosystem Assessment. Summary for Policy Makers

Madamombe, I. 2005. Energy key to Africa's prosperity: Challenges in West Africa's quest for electricity. Africa Renewal, 18(4): 6.

Madeira et al., 2010 17 (To be completed)

Madsen, Becca; Carroll, Nathaniel; Moore Brands, Kelly; (2010). State of Biodiversity Markets Report: Offset and Compensation Programs Worldwide. Available at: http://www.ecosystemmarketplace. com/documents/acrobat/sbdmr.pdf

MAP 2006 (12) (To be completed)

Mason, S. A. 2004. From Conflict to Cooperation in the Nile Basin. Ph D Thesis submitted for the Swiss Federal Institute of Technology, Zurich.

McCaffrey, S.C. and Neville, K.J. (2009), "Small Capacity and Big Responsibilities: Financial and Legal Implications of a Human Right to Water for Developing Countries," *Willliamette Journal of International Law & Dispute Resolution* 21 (Summer 2009): 693.

McLeod, E. and Salm, R.V. (2006). *Managing Mangroves for Resilience to Climate Change.* IUCN, Gland, Switzerland. 64pp.

Meadows, D.L. (1999). Leverage Points. Places to Intervene in a system. The Sustainability Institute

Mee, L. (2010). Between the Devil and the Deep Blue Sea: The coastal zone in an Era of

globalization. *Estuarine, Coastal and Shelf Science* 2010: 1-8.

Mekonnen, D, Z. 2010. The Nile Basin Cooperative Framework Agreement Negotiations and Adoption of a water Security; Paradigm: Flight into Obscurity or a Logical Cul-de-sac>. The European Journal of International law Vol. 21 (2): 421-440

MERJ/MIRI 2003 (To be completed)

MCM/DEAT (2000). *White Paper for Sustainable Coastal Development in South Africa*. Marine and Coastal Management, Department of Environmental Affairs and Tourism, Pretoria.

Mehta, L. 2005. Unpacking rights and wrongs: do human rights make a difference? The case of water rights in India and South Africa. Institute of Development Studies, Brighton, Sussex, England. 1-27.

Midgley, D. C., Pitman, W. V. and Middleton, B. J. (1994) Surface Water Resources of South Africa 1990, Appendices. Water Research Commission, Pretoria — Report 298/4.1/94

Milder, J. C., S. J. Scherr, and C. Bracer. (2010). Trends and future potential of payment for ecosystem services to alleviate rural poverty in developing countries. *Ecology and Society* **15**(2): 4. [online] URL: http ://www.ecologyandsociety.org/vol15/iss2/art4/

Mohamed-Katerere, J.C. (2001). *Review of the Legal and Policy Framework for Transboundary Natural Resource Management in Southern Africa*. IUCN-ROSA Series on Transboundary Natural Resource Management

Mohamed-Katerere, J.C. (2009). Climate Change, Natural Resource Governance and Human Security in Africa. Charting New Paths. In *Natural Resource Governance and Human Security in Africa. Emerging issues and trends*. (Eds Kesselman, Hughes, Kabemba, Matose and Rocha) Pax-Africa, Johannesburg

Mohamed-Katerere and Jones (2011 –forthcoming) REDD, Rights and Resilience

Mwangi and Mutunga 2005 p. 12 (To be completed)

Muramira 2005 p 12 (To be completed)

Murombedzi, J.C. (2010) agrarian Social Change and Post-Colonial Natural Resource Management Interventions in Southern Africa's Communal Tenure Regimes. In Community Rights, Conservation and Contested Land. The Politics of Natural Resource Governance on Africa. (ed. Nelson) Earthscan, London

Najam, A and M. Halle (2010). Global Environmental Governance: The Challenge of Accountability. Sustainable Development Insights.

NBI, 2010. Transboundary Environmental Analysis. NBI Shared Vision programme. NBI, GEF, UNDP, WB. Pp. 117.

Nelson, F. (2010). Community Rights, Conservation and Contested Land. The Politics of Natural Resource Governance in Africa. Earthscan London

Nicholls, R.J., Hoozemans, F.M.J. and Marchand, M., 1999. Increasing flood risk and wetland losses due to global sea-level rise: regional and global analysis. *Global Environmental Change*, 9: 69-87.

Nicholls, R.J., Wong, P.P., Burkett, V., Woodroffe, C.D., Hay, J., 2008. Climate change and coastal vulnerability assessment: scenarios for integrated assessment. *Sustainability Science*, 3(1): 89-102

Nwilo and Badejo 2010, 30 (To be completed)

Odoi 2010, 35 (To be completed)

Okonmah, P.D., (1997). 'Right to a Clean Environment: the Case for the People of Oil Producing Communities in Nigerian Delta'. *Journal of African Law*, vol.41, 43-67.

Osborn and Datta 2006, 31 (To be completed)

Oxfam, CIRAD, CDE and ILC 2011 (To be completed)

Ochieng et al., 2007 (12) (To be completed)

Pagiola, S., A. R. Rios, and A. Arcenas. (2008). Can the poor participate in payments for environmental services? Lessons from the Silvopastoral Project in Nicaragua. *Environment and Development Economics* 13(3):299-325.

Pahl-Wostl, C. 2006. The importance of social learning in restoring the multifunctionality of rivers and floodplains. Ecology and Society 11(1): 10. [online] URL: http://www.ecologyandsociety.org/vol11/iss1/art10/

Patt, A.G and D.Schroter (2005) Perceptions of climate risk in Mozambique: Implications for the success of adaptation strategies. Global Environmental Change 18 (2008) 458– 467

Philip L.-F. Liu, Patrick Lynett, Harindra Fernando, Bruce E. Jaffe, Hermann Fritz, Bretwood Higman, Robert Morton, James Goff, and Costas Synolakis (2005) Observations by the International Tsunami Survey Team in Sri Lanka. **Science** 10 June 2005: **308** (5728), 1595.

Pietersen, K. and H. Beekman (2006). Freshwater. In Africa Environment Outlook 2. Our Environment Our Wealth. UNEP, Nairobi

Pimbert M and T. Wakeford, *2002* Prajateerpu: a Citizens Jury / Scenario Workshop on Food and Farming Futures for Andhra Pradesh *Economic and Political Weekly, 37 (27), July 6, 2002.*

Post, J. C. and Lundin, C. G. (eds.) (1996). Guidelines for Integrated Coastal Zone Management. *Environmentally Sustainable Development Studies and Monograph Series* No 9: Washington D. C.

Rainforest Alliance 2010. Uganda´s Carbon Project. Available at http://www.rainforest-alliance.org/newsroom/news/uganda-carbon-project

RAMPAO 2011 (p 10) (To be completed)

ReCoMaP (2011). Regional Coastal Management Programme of the Indian Ocean. Accessible online at http://recomap-io.org/home/ (accessed May 2011).

Republic of Madagascar, 2006. Madagascar Action Plan 2007-2012.

Riedmiller, S. 2000. A Private Marine Protected Area: Chumbe Island Coral Park of Zanzibar. In Coral Reefs of the Indian Ocean, ed. T. McClanahan. Oxford University Press.

Rights and Resources Initiative (2009). The End of the Hinterland. Forests, Conflict and Climate Change. Rights and Resources Initiative, Washington D.C.

Rights and Resources Initiative (2010). Who owns the Forest? Rights and Resources Initiative, Washington D.C.

Roe, D., H. Reid, K.Vaughan, E. Brickell, and J. Elliot (2007) Climate, Carbon, Conservation and Communities. An IIIED/WWF Briefing. International Institute for Environment and the World Wildlife Fund, London

Runhaar, H. and P. P. J. Driessen (2007).What makes strategic environmental assessment successful environmental assessment? The role of context in the contribution of SEA to decision-making *Impact Assessment and Project Appraisal*, 25(1), March 2007, pages 2–14

SADC 1992 p 8 (To be completed)

Sampong, E., (2004). A Review of the Application of Environmental Impact Assess- ment (EIA) in Ghana. A Report prepared for the United Nations Economic Commission for Africa in December, 2004.

Scherr, S., White, A. and D. Kaimowitz. (2004). A New Agenda For Forest Conservation and Poverty Reduction: Making Markets Work for Low-Income Producers. Washington, DC: Forest Trends. p88–89.

Scholes, R.J.,kuper, W. and R.Biggs (2006). Biodiversity. In Africa Environment Outlook 2. Our Environment Our Wealth. UNEP, Nairobi

Schulster, T.A; D. J. Decker and M.J. Pfeffer 2003. Social Learning for Collaborative Natural Resource Management. Society and Natural Resources 15:309–326, 2003

Serra C & Tanner C (2008). Legal empowerment to secure and use land and resource rights in Mozambique. In L Cotula & P Mathieu (eds) Legal empowerment in practice: Using legal tools to secure land rights in Africa. London: IIED & FAO

Sheridan, M.J. (2009). The Environmental and Social History of African Sacred Groves: A Tanzanian Case Study. African Studies Review, 52 (1)73-98.

Singh, A., Dieye, A., Finco, M., Chenoweth, M.S., Fosnight, E.A. and Allotey, A., 1999. Early Warning of Selected Emerging Environmental Issues in Africa: Change and Correlation from a Geographic Perspective. United Nations Environment Programme, Nairobi, Kenya.

SMAPIII (2009). *The Way Forward for the Mediterranean Coast: a framework for implementing regional ICZM policy at the national and local level*. Priority Actions Programme Regional Activity Centre, Split.

Smith, J. 2003: *Are South Africa's water service delivery policies and strategies are equitable, accessible, affordable, efficient, effective and sustainable for Msunduzi low-income households?*.Faculty of Science and Agriculture, University of Natal, Pietermaritzburg.

Stalk, A. (2004). Management of the Free Basic Water Policy in South Africa. Master Project. Roskilde University.

Steyl, I. (1997). Strategic Enviromental Assessment for Stream Flow Reduction Ac- tivities in South Africa: A Way of Enhancing Decision-Making.

Stanton, T., Echavarria, M., Hamilton, K., and Ott, C. (2010). State of Watershed Payments: An Emerging Marketplace. Ecosystem Marketplace. Available online: http://www.foresttrends.org/documents/files/doc_2438.pdf

Sunderlin, W.D., Hatcher, J. and M. Liddle (2008) From Exclusion to Ownership? Challenges and Opportunities in Advancing Forest Tenure Reform. Rights and Resources Initiative. Washington DC

Sunderlin, W.D and S.Atmadja (2009). Is REDD an idea whose tome has come or gone. In Realising REDD. National Strategy and Policy Options. (Ed. Angelsen). CIFOR, Bogor.

Sutcliffe, S. 2009. The Hydrology of the Nile Basin. H. Dumont (ed.), The Nile: Origin, Environments, limnology and Human use. Monographiae Biologicae, Vol. 89, Springer, Dordrecht. pp. 335-364.

Swallow, B. M., M. F. Kallesoe, U. A. Iftikhar, M. van Noordwijk, C. Bracer, S. J. Scherr, K. V. Raju, S. V. Poats, A. Kumar Duraiappah, B. O. Ochieng, H. Mallee, and R. Rumley. 2009. Compensation and rewards for environmental services in the developing world: framing pan- tropical analysis and comparison. *Ecology and Society* 14(2): 26. [online] URL: http://www.ecology andsociety.org/vol14/iss2/art26/.

Swatuk et al., 2009 (To be completed)

Talbot, R. and Williams, M. 2009. Cenozoic Evolution of the Nile Basin. H. Dumont (ed.), The Nile: Origin, Environments, limnology and Human use. Monographiae Biologicae, Vol. 89, Springer, Dordrecht. pp. 37-60.

Teshome, W. B. 2008. Transboundary Water Cooperation in Africa: The case of the Nile basin Initiative. Alternatives: Turkish J. of International Relations. Vol. 7(4): 34-43.

Thérivel, R and P Minas (2002). Measuring SEA effectiveness. Ensuring effective sustainability appraisal. *Impact Assessment and Project Appraisal*, **20**(2), 81–91.

Tjaard, S., Botes, W.A.M., Oelofse, S.H.H. and Viljoen, P. (2006). Operational policy for disposal of land-derived wastewater to the marine environment of South Africa, *Water SA*, Vol.32, No.4, p.527 – 533.

Ukwe and Ibe 2010 31 (To be completed)

UNGA (2010). General Assembly adopts resolution recognizing access to clean water, sanitation as a human right. GA/10967 http://www.un.org/News/Press/docs/2010/ga10967.doc.htm

UN-HABITAT. (2010). *The State of African cities 2010: Governance, Inequality and Urban Land Markets*. United Nations Human Settlements Programme, Nairobi.

UN/WWAP (United Nations/World Water Assessment Programme) 2003. *UN World Water Development Report: Water for People, Water for Life.* Paris, New York and Oxford, UNESCO and Berghahn Books, Paris, NY and Oxford.

UNDP PEI (To be completed)

UNCED (1993). Earth Summit Agenda 21: the United Nations programme of action from Rio. United Nations Conference on Environment and Development.

UNECA, 2000. Transboundary River/Lake Basin Water Development in Africa: Prospects, Problems and Achievements. ECA/RCID/052/00 , Addis Ababa, Ethiopia.

UNEP (2011). Nairobi Convention. Accessed online at http://www.unep.org/NairobiConvention/index.asp (accessed May 2011).

UNEP 2002 (To be completed)

UNEP 2006 (To be completed)

UNEP-MAP (2008). *Protocol on Integrated Coastal Zone Management in the Mediterranean*. UNEP Mediterranean Action Plan (UNEP-MAP), Priority Actions Programme.

UN-REDD 2010 (To be completed)

UNEP-WCMC (2003). Traditional Lifestyles and Biodiversity Use Regional report: AFRICA Composite Report on the Status and Trends Regarding the Knowledge, Innovations and Practices of Indigenous and Local Communities Relevant to the Conservation and Sustainable Use of Biodiversity. WCMC, Cambridge

Vafeidis, A.T., Boot, G., Cox, J., Maatens, R., McFadden, L., Nicholls, R.J., Spencer, T., and Tol, R.S.J., 2005. The DIVA Database Documentation. - on DIVA CD and www.dinas-coast.net.

Varis, O., Rahman, M. M. and Stucki, V. 2008. Integrated Water Resources management Plans: The Key to Sustainability? In Kummu, M., Keskinen, M. and Varis, O. (eds.): Modern Myths of the Mekong. pp. 173-183.

Varis, O., Virpi Stucki & Sylvie Fraboulet-Jussila, Case Study for 2006 HDR. The Senegal River Case.

Wachira, G.M. (2008) African Court on Human and Peoples' Rights: Ten years on and still no justice Minority Rights Group http://www.unhcr.org/refworld/pdfid/48e4763c2.pdf

Whande, W (2010) Windows of opportunity or exclusion? local communities in the Great Limpopo Transfrontier Conservation Area, South Africa. In Community Rights, Conservation and Contested

Land. The Politics of Natural Resource Governance on Africa. (ed. Nelson) Earthscan, London

Wells et al., 2006 (To be completed)

Wendland et al., 2009 (To be completed)

Weru, S. (Undated). Policy implications in the management of Kenya's Marine Protected Areas. *Economic Valuation for Sustainable Management of Coral Reefs*. World Fish Centre.

Winkler, I. (2008). "Judicial Enforcement of the Human Right to Water - Case Law from South Africa, Argentina, and India," *Law, Social Justice & Global Development* 1:4 http://www.go.warwick.ac.uk/elj/lgd/2008_1/winkler

Wolmer, W. (2003) Transboundary Conservation: The Politics of Ecological Integrity in the Great Limpopo Transfrontier Park. Journal of Southern African Studies, 1465-3893, Volume 29, Issue 1, 2003, Pages 261 – 278

Woodhill, Jim 2010 Capacities for Institutional Innovation: A Complexity Perspective.. In Reflecting Collectively on Capacities for Change IDS Bulletin 41.3

World Bank 2010 (To be completed)

World Bank 2009 (pp 5) (To be completed)

World Bank (2011). Tanzania Marine and Coastal Environmental Management Project. Accessible online at http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/TANZANIAEXTN/0,,contentMDK:20992192~menuPK:287367~pagePK:1497618~piPK:217854~theSitePK:258799,00.html (accessed May 2011).

World Commission on Dams (WCD (2000). Dams and Development. A New Framework for Decision Making. Report of the World Commission on Dams. Earthscan, London2002)

World Coal Institute (2002) Water management initiatives in the Upper Olifants River Catchment. *Good News from Coal* — August (World Coal Institute). Available at http://www.worldcoal.org/assets_cm/files/PDF/water_management_in_south_africa.pdf .

Wunder, S. (2005). *Payments for environmental services: some nuts and bolts.* CIFOR Occasional Paper Number 42. Centre for International Forestry Research, Bogor, Indonesia.

Wunder, S. (2008). Payments for environmental services and the poor: concepts and preliminary evidence. *Environment and Development Economics* 13(3):279-297.

Wunder, S., and M. Albán. (2007). Decentralized payments for environmental services: the cases of Pimampiro and PROFAFOR in Ecuador. *Ecological Economics* 65(4):685-698.

Zedler, J.B. and Kercher, S. (2005) Wetland Resources: Status, Trends, Ecosystem Services, and Restorability Annual. Rev. Environ. Resources. 2005. 30:39–74.

Global Environment Outlook Unit
United Nations Environment Programme (UNEP)
P.O. Box 30552 - 00100 Nairobi, Kenya
Tel: +254 20 762 4546 / 3491
Fax: +254 20 762 3944
e-mail: geo.head@unep.org
www.unep.org/geo

www.unep.org

United Nations Environment Programme
P.O. Box 30552 - 00100 Nairobi, Kenya
Tel.: +254 20 762 1234
Fax: +254 20 762 3927
e-mail: uneppub@unep.org
www.unep.org

UNEP