



RECOMMENDATIONS

- Policymakers should make greater use of ecosystem valuations and ecological accounting in order to evaluate developmental alternatives, and, where appropriate, accelerate and scale up investments in the management and restoration of mangrove ecosystems.
- Rapid economic growth should be reconciled with the maintenance of ecological processes and coastal biodiversity. Spatial development planning and management tools should be used to convert potential conflicts into synergies, and mangrove management should be integrated with a broader spatial framework of coastal zone management.
- The value of mangrove ecosystem services should be quantified and incorporated into EIAs as well as resultant mitigation/compensation plans and calculations.
- Communities should be included in decision-making about mangrove protection and restoration.
- National and transfrontier protected areas should be enlarged and expanded in order to help conserve biodiversity, and maintain ecosystem services. Guidelines for regulating specific conservation zones should be improved.

Governing Africa's Mangroves: A Sustainable Future

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EXECUTIVE SUMMARY

Despite their widely recognised socioeconomic and ecological value, mangroves are among the world's most threatened vegetation types. More than a fifth of the world's mangroves have been lost over the past 30 years alone, and many surviving forests are degraded. Safeguarding them will require urgent interventions aimed at ensuring that their vital ecosystem services and non-market benefits are adequately incorporated in policy and development choices. Given Africa's extractive boom, countries need to fully understand the consequences of natural resource exploitation for their fragile ecosystems, in order to minimise negative impacts and avoid poor trade-offs. Policy-makers and planners must realise that mangroves need to be restored, protected, and managed. This will require more effective management tools and interventions, as well as mechanisms for minimising the tensions between extractive development and the conservation of mangrove forests.

INTRODUCTION

Given their position at the interface between sea and land, mangroves play a vital role in moderating monsoonal tidal floods and in providing other forms of coastal protection. They also support numerous forms of fauna and flora, as well as estuarine and near-shore fisheries. Moreover, they sequester large amounts of carbon dioxide, thereby helping to mitigate climate change. The continuing degradation and depletion of this vital resource will reduce terrestrial and aquatic wildlife habitats, and threaten the livelihoods of people who depend on their ecosystem services and functions.

About 44% of the world's population live within 150 kilometres of a coastline, leading to the degradation and clearing of coastal vegetation for development, agriculture, fuel wood, aquaculture and other resource uses. One fifth of the world's mangroves are found in sub-Saharan Africa, with

Nigeria, Guinea Bissau, Mozambique and Madagascar home to the largest mangrove forests on the continent. In all these countries, mangroves coincide with fossil fuel deposits and current or proposed infrastructure projects.

The total economic value associated with the more sustainable management of these ecosystems is often higher than the value associated with their conversion into farming, logging, aquaculture, or other intensive and unsustainable practices. Accurate quantification is important for establishing the 'true' value of mangrove forests, and using this to attract investment back into conservation.

ACTIONS AND INTERVENTIONS

Reversing mangrove loss will require a real commitment by governments to develop and implement robust policies for controlling and managing their mangrove resources. Such a framework, which would harmonise all human activity with the sustainable use and governance of mangroves forests, will require specific actions and interventions which are outlined below.

Adopting economic models that demonstrate the true value of mangroves

The value of mangroves is often ignored or underestimated when the economic values of proposed coastal developments are calculated. The products and services provided by mangroves are usually externalised and therefore not accounted for, making other coastal developments seemingly more profitable. Conventional macroeconomic performance indicators do not effectively reflect the dynamic nature of ecosystem services, and do not provide adequate information about a given country's natural wealth and the health of its environment. Given that ecosystems and their services are an integral part of national wealth, calculating their value over time should be a key economic indicator.

If mangroves are to become more viable investment options, their true value should be calculated. Various new models for calculating the value of ecosystem goods and services are available. The 2010 *World Atlas of Mangroves*² provides powerful economic arguments in favour of mangrove management, protection and restoration. It estimates the global value of mangrove ecosystem services at \$1.6 billion a year, and their yield per hectare at \$2000–9000 a year – considerably more than the value of possible alternative uses.

Adopting an integrated, ecosystem-based approach to natural resources management and planning

An integrated, ecosystem-based approach recognises the importance of and interplay among terrestrial, marine and coastal systems, as well as the impact of a range of sectors on land use change in coastal zones. This approach is particularly useful when managing and balancing multiple or conflicting objectives related to different benefits and ecosystem services. Mangrove-rich African countries should pursue an integrated management regime for all coastal ecosystems and resources, including hydrocarbons, mining, ports, tourism, fisheries, and conservation. This approach will help African governments to map current and future human and industry footprints in their coastal zones, thus improving their understanding of the needs of coastal communities as well as current economic activities. This will facilitate effective planning as well as sound policy decisions which prioritise sensitive areas and maintain the ecological linkages between terrestrial and marine ecosystems.

Integrating the management and protection of mangroves into development planning and poverty reduction strategies

Mangrove ecosystem services and conservation should be incorporated into mainstream economic planning and development policy at all levels, including national development and poverty reduction strategies, fisheries and forestry action plans, and pre-emptive policies such as natural disaster risk management and strategic environmental assessments. In cases where economic development and biodiversity priorities overlap, centralised, interdisciplinary forums should guide strategic national decisions.

Enabling policies and legal frameworks to better protect mangroves

Rates of mangrove loss in various countries vary considerably, often due to national differences in policies, legislation and management. Malaysia and Tanzania, for example, have placed all mangroves in state reserves. Some countries have adopted blanket regulations for protecting mangroves, while others permit licensed exploitation. Australia and the US have adopted 'no net loss' policies that restrict the future clearance of mangroves. Some countries have also adopted legislation aimed at addressing inadequate aquaculture standards. In the Philippines such laws have greatly altered the

shape of new aquaculture developments, with mangroves being replanted on a large scale in abandoned shrimp ponds in an effort to restore the absorption potential of degraded land. Mexico, Belize, Tanzania and Mozambique are seeking to control destructive activities via strict licensing systems and the use of Environmental Impact Assessments (EIAs).

African policymakers should use relevant national and sectoral legislative tools to improve environmental decision-making and biodiversity planning. Useful instruments have been developed for accelerating environmental authorisations without undermining impact management principles. Although these tools are country-specific, they could include Strategic Environment Assessments (SEAs), Environmental Management Frameworks, and EIAs. In some cases these instruments have become outdated or ineffective, and need to be strengthened. Many African countries need more technical capacity for implementing EIAs and conducting feasibility studies. This is urgently needed in order to assess the impact of proposed mining and other extractive activities as well as aquaculture and infrastructure development projects.

Promoting sustainable land use change practices

Where a loss of biodiversity cannot be avoided, governments and developers need to find alternative ways of changing land use that would limit the impact on ecosystem services. In Guinea Conakry, Guinea Bissau and Sierra Leone, more sustainable methods for smoking fish and producing salt have been introduced which reduce the demand for firewood from mangrove forests. Some aquaculture projects in Indonesia and Vietnam are promoting sustainable shrimp farming through the silvofishery concept, which involves replanting mangroves near and inside used shrimp and fishponds. Also, in countries rich in fossil fuels, developers and public entities should be assisted to assess, avoid, minimise and mitigate the direct and indirect impacts of extractive industries on wetlands by observing a range of precautionary good practices.

Restoring and replanting mangrove forests

This has been done in many countries and can reverse patterns of loss while bringing considerable socioeconomic benefits to coastal areas. As foresighted countries acknowledge the link between coastal forests and economically important services, mangroves are increasingly being replanted and protected worldwide.

Current restoration efforts cover some 400 000 hectares. Restoration is generally far more expensive than protecting the original ecosystem, and full recovery is often not possible. In India, Indonesia and Senegal, NGOs are helping communities to plant mangrove trees, and to collaborate with the private sector on carbon offsets.

Conserving biodiversity via protected areas

Well-governed and managed protected areas are a proven way of safeguarding both habitats and species, and delivering important ecosystem services. Effective management allows the total protection or the managed and sustainable use of natural resources. Choosing one of these alternatives should depend entirely on species information specific to each area. Reliable data is needed for refining conservation priorities and informing policies for regulating resource extraction, trade, and coastal development. Information needs to include the presence of threatened species and the designation of critical habitats, no-take zones, and marine protected areas. Tools developed to assist in this regard include the International Union for Conservation of Nature Red List of Endangered Species, Conservation International's Biodiversity Hotspots, and the World Wide Fund for Nature's Global 200 Eco-regions. Vulnerable or endangered ecosystems that appear on these lists need to be dealt with in ways that correspond with scientific evidence. Various mangrove species appear on these lists. Given their importance, more mangroves should be placed in protected areas.

Using international environmental conventions and treaties

Well-established protocols relevant to mangrove conservation also provide opportunities for strengthening the management of mangrove areas. International treaties which protect mangroves to some extent include the Ramsar Convention on Wetlands, the UN Convention on Biological Diversity (CBD), and the International Tropical Timber Agreement (ITTA). These mechanisms, and others, provide countries with a platform for highlighting their environmental achievements and subjecting them to international scrutiny, thus promoting better management practices through peer learning. However, these instruments do not automatically provide mangrove ecosystems with legal protection, and do not protect or conserve particular mangrove species. They also do not carry sufficient penalties for non-compliance, and are only effective if implemented by national parties.

Making use of forestry certification schemes

Certification schemes can also be used to verify forestry practices. They include the Forest Stewardship Council (FSC), a voluntary certification system that provides internationally recognised standard setting, trademark assurance and accreditation services for forestry activities. Although not foolproof, the FSC certification, and others, provide a credible link between the responsible production and consumption of forest products, assuring consumers that their products come from well-managed forests. Mangrove wood is regarded as 'high-risk' under the FSC scheme, and legal trade is subject to scientifically determined quotas. However, schemes such as the FSC are only useful when either the commercialising entity or the final consumer is concerned about sustainability, and demands FSC-certified products.

Using market-based mechanisms and economic instruments to conserve and pay for ecosystem services

The use of incentives, compensation mechanisms and other economic instruments is a growing trend in carbon, biodiversity and water markets. Payment for Ecosystem Services (PES) schemes has been based on the premise that natural ecosystems provide valuable services, and that, if marketed correctly, these services can help watershed and biodiversity conservation to pay for itself and generate income for those willing to participate. These measures are aimed at encouraging behavioural change by offering additional employment benefits and supplementary incomes in return for the sustainable use of natural resources. Market mechanisms and PES schemes offer financial incentives for protecting non-market ecosystem benefits. For example, Blue Carbon can be traded in similar ways to Green Carbon, and entered into climate mitigation protocols along with other carbon-binding ecosystems.

These new financing options would lessen the management burden of traditional management entities, and allow more direct engagements with local communities, user groups, industries, and other stakeholders. However, new schemes need to make good business sense and demonstrate valuable co-benefits, such as ecosystem-based job creation.

Although mangrove action plans are developed at the national level, they need to be implemented and enforced at the local level. As the key beneficiaries of mangrove goods and services, local communities need to buy into new management strategies. Coastal communities are able to manage and protect ecosystems, and can play key roles in restoration.

CONCLUSION

Current gaps in the regulation and management of coastal ecosystems need to be addressed so that priority is given to balancing those interests, and stimulating economic development and growth in ways that are compatible with the maintenance of vulnerable coastal ecosystems. Policy-makers must be made aware of the cumulative impacts of their decisions, and the need to include effective measures for mitigating negative environment impacts in the approval processes for mega-projects.

Enhancing managerial approaches and principles is key to improving the status of degraded mangroves and for encouraging sustainable land-use change. This study shows that human pressures and economic activities are compromising the resilience of mangroves, and eroding their capacity to deliver vital services. Decisions about the use of ecosystems and their services should acknowledge their multiple values, and encourage their conservation. Countries should work towards developing effective ecosystem management tools and conservation incentives for securing their mangroves. The improved quantification of ecosystem services should provide policymakers with a compelling case for conserving and restoring mangroves, and including them in broader economic frameworks for coastal planning and management.

ENDNOTES

- 1 Romy Chevallier is a senior researcher for the Governance of Africa's Resources Programme of the South African Institute of International Affairs.
- 2 Spalding M *et al.*, *World Atlas of Mangroves*, Earthscan, 2010.

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