



Putting Ecosystem Management in the Vision of Africa's Development

Towards a sustainable Green Economy

This paper was drafted by the following:

Dr. Richard Munang, Policy Advisor, Climate Change Adaptation, UNEP

Dr. Jian Liu, Director, IEMP UNEP

Dr. Chuku A. Chuku, University of Uyo, Uyo, Nigeria.

Dr. Samuel Codjoe, University of Ghana

Dr. Delali Dovie, University of Ghana

Dr. David D Mkwambisi, University of Malawi

Dr. Mike Rivington, Research Fellow, James Hutton Institute, UK

Review Editors:

Ibrahim Thiaw, Director, DEPI UNEP

Mounkaila Goumandakoye, Regional Director, UNEP Regional Office for Africa

Dr. Desta Mebratu, Deputy Regional Director, UNEP Regional Office for Africa

David Osborn, Coordinator, Ecosystem Management Programme, DEPI, UNEP

Prof. Richard Odingo, Visiting senior fellow, IEMP, UNEP

Acknowledgements:

We are grateful to all colleagues for their additions and comments on different versions of this paper. We are highly appreciative for the financial and in-kind support from the Chinese Academy of Science (CAS) to UNEP-IEMP which led the drafting of this paper.

Table of Contents

Purpose: 1

Key messages 2

Rationale: 3

What is Ecosystem Management approach?..... 4

Challenges and Opportunities/Quick-wins to an Integrated
Ecosystem Management Approach to Africa’s Development 4

Creating a Sustainable Green Economy in Africa using
Ecosystems Management 7

Examples of Ecosystems Management actions paving the way towards a Green
Economy in Africa 9

Recommendations for putting Ecosystems Management in the Vision of Africa’s
Development 10

Conclusions 11

Many Africa's societies have a broad diversity of natural resources (soils, vegetation, water, wildlife, etc.) which constitute the continent's natural capital assets that have been harnessed to different degrees to enhance social, human and financial capital to alleviate poverty.

Purpose:

This policy paper details the preeminent that is waiting to be played by the adoption of ecosystems management as an instrument of natural resources management in Africa, and how such a change would open the way to greater sustainability in resource use in the continent and catapult the continent to a greener path to economic development. Many Africa's societies have a broad diversity of natural resources (soils, vegetation, water, wildlife, etc.) which constitute the continent's natural capital assets that have been harnessed to different degrees to enhance social, human and financial capital to alleviate poverty. However, inappropriate management practices in the use of these natural resources which form the basis of their ecosystems services and processes, have led to a decline in ecosystems 'capacity to produce goods and services thus jeopardising their social and economic value for human societies across the continent. Even though Africa's societies depend upon ecosystems to deliver net development gains, benefits accruing from those ecosystem services are unequally distributed and have led to losses for some communities, leaving many groups unable to break free from poverty (MA, 2005). Deliberate and informed investing in ecosystems can bring enormous benefits to the Africa's continent, providing the dual goals of supporting local communities, as well as helping them cope with and adapt to a changing climate.

This issues paper aims to:

- i. demonstrate the foundational significance of ecosystems in maintaining Africa's societies, and
- ii. draw the attention of Africa's policy-makers to the challenges and opportunities in ecosystem management and
- iii. Propose recommendations for enhanced actions on capacity building such as continent-wide ecosystem research network, policy setting and regional cooperation.
- iv. The paper also aims to stimulate discussion and debate on how Africa's societies can avoid degrading the natural environment and with it, the wealth and valuable benefits it provides, and instead promote and utilise healthy ecosystems to support a sustainable and more climate-resilient future for the continent. Coming as it does, just before COP17 in Durban South Africa in December 2011 and RIO+20 in June 2012, this brief is timely as it is bound to help spur momentum and provide a new roadmap for managing Africa's ecosystems whilst helping to foster a better Africa's society-wide understanding and appreciation of their importance of ecosystems in providing the essential life support systems we all depend upon.

Key messages

- To enhance understanding of ecosystem services and processes, functions and societal interactions, there is an urgent need to increase national awareness of their place in the development process. One way to achieve this aim is by developing an Africa Ecosystem Research Network, with core functions of monitoring, research, demonstration, policy support and capacity building. This will go in a long way, to help enhance the capacity of scientists and policy makers in Africa to work towards sustainable management of their ecosystems and livelihoods as regular practice.
- There is a crying need to work towards the legislation and institutional reforms in this important area. While existing laws may contain fragments of ecosystem management concepts, there are still significant challenges to be confronted. One such challenge involves educating the governments to employ ecosystems management as the most desirous approach.
- Institutional innovations that require merging ecosystems management with economic management at relatively larger spatial and temporal scales are needed for Africa. Notwithstanding, greater commitment to effective management of ecosystems on the part of countries and creation of an institutional mechanism for managing ecosystems across political and jurisdictional boundaries are essential co-requisites.
- Growth accounting without explicit valuation of ecosystem services is an incomplete analytical framework: Embracing and capturing economic values of ecosystem services in mainstream decision making tools and indicators, for example a national income and growth matrix, can help in designing effective policies for sustainable growth and societal well-being.
- Investing in a new development model using small-scale fiscal stimulus that mobilises the untapped potential of local people is imperative for unleashing a low carbon and Green Economy.
- An analysis of the role that an economic institution, specifically 'the market', plays in promoting the adoption of ecosystems management on both public and private domains is needed.
- Ultimately, there is the need to clarify the relationship between economic growth and ecosystems sustainability in Africa.

Even though Africa's societies depend upon ecosystems to deliver net development gains, benefits accruing from those ecosystem services are unequally distributed and have led to losses for some communities, leaving many groups unable to break free from poverty (MA, 2005).

Rationale:

Ecosystems in Africa and throughout the world provide the geographical space that allows biodiversity to thrive. Currently there are severe pressures on the health of ecosystems, as human populations in most countries expand. Drivers generating these pressures include high levels of poverty and rapid growth in human populations on the continent. Already, increases in appropriation, consumption and disposal of resources to meet the growing demand are not matched by corresponding replenishment and growth in the environmental base. At the same time climate change is posing substantial risks to the health of ecosystems and compromising their ability to provide services. In the context of rising population and resource use per capita. ¹Such a combination of environmental, climatic and economic pressures leading to food, water and energy shortages has the potential of brewing into a 'perfect storm' This brief explores an ecosystem management-based set of solutions that the Africa's society can use to avoid potential future problems, as well as for coping with and adapting to changes we are already experiencing and will likely continue to experience.

Despite the increasing awareness of the interrelationships between ecosystems and development, national and regional governments including development partners in Africa are still pursuing developmental activities which have typically not included the links between ecosystems health and development, nor the possibilities for harnessing synergetic effects from an ecosystem perspective to development policy. Examples include; the Millennium Development Goals, National Poverty Reduction Strategies (NPRS) and the New Partnership for Africa's Development (NEPAD)² which have all been brought to the development table without incorporating the ecosystems approach. The reason for an ecosystem perspective to development in Africa is simple. First, because Africa's ecosystems typically cut across administrative and jurisdictional boundaries, managing them requires interactions among different stakeholders and institutions. Thus, achieving an integrated ecosystem based approach to development in Africa will require a strategy that will merge ecosystem science and socioeconomic principles, initiate institutional change and coordination, and ensure stakeholder participation and collaborative decision making.

To bring about such change however, it is essential to assess and modify the

¹ The Place of Nature in Economic Development. Dasgupta working paper. 2009. http://www.sandeeonline.com/uploads/documents/publication/845_PUB_Working_Paper__38.pdf

² Chuku, C. A. (2010). Pursuing an integrated development and climate policy framework in Africa: Options for mainstreaming. *Mitigation and Adaptation Strategies for Global Change (Springer)*. 15 (1), 41-52. Electronic copy available at [DOI 10.1007/s11027-009-9203-8](https://doi.org/10.1007/s11027-009-9203-8).

There is a crying need to work towards the Legislation and institutional reforms in this important area. While existing laws may contain fragments of ecosystem management concepts, there are still significant challenges to be confronted.

way ecosystem benefits are internalised into conventional decision making tools. Currently, the global economic model and system of national accounts do not give sufficient consideration to benefits people derive from ecosystems in the long term. Sometimes they are not even considered. This, leads to the overuse or misuse of natural resources rather than their sustainable and efficient use. Without full valuation of less-tangible benefits from ecosystems, their exploitation will remain unsustainable and degradation remains inevitable leading to the potential collapse of important ecosystem functions and services. It is increasingly evident that there is a need to develop an economic model that accurately reflects benefits to people from the environment and the costs associated with ecosystem degradation. Getting this right will help move the Africa's continent towards sustainability.

What is Ecosystem Management approach?

Ecosystem management may be defined as *“an integrated process to conserve and improve ecosystem health that sustains ecosystem services for human well-being”*. The IUCN gives it the expanded definition of *“a process that integrates ecological, socio-economic, and institutional factors into comprehensive analysis and action in order to sustain and enhance the quality of the ecosystems to meet current and future needs”*. As such, ecosystem management embraces a holistic, inter-disciplinary approach that recognises the inter-connectivity between ecological, social-cultural, economic and institutional structures. The approach is driven by explicit goals and executed through policies, protocols and practices updated by knowledge gleaned from research on and monitoring of ecological interactions and processes sustaining ecosystem composition, structure, and function.

Challenges and Opportunities/Quick-wins to an Integrated Ecosystem Management Approach to Africa's Development

Climate change may be threatening the long term provision of ecosystem goods and services, but it also presents a new opportunity to get our global accounting system “right” and truly move towards a sustainable Green Economy. This opportunity presents itself through an Ecosystem Management Approach (EMA), which encourages cost-efficient policies and development strategies that blend short-term needs with long-term targets that place conservation and management of ecosystems at its centre. A further opportunity exists in that the Green Economy is one that can evolve by global consensus with the aim of meeting the basic human needs of all

Despite the increasing awareness of the interrelationships between ecosystems and development, national and regional governments including development partners in Africa are still pursuing developmental activities which have typically not included the links between ecosystems health and development....

Climate change may be threatening the long term provision of ecosystem goods and services, but it also presents a new opportunity to get our global accounting system “right” and truly move towards a sustainable Green Economy. This opportunity presents itself through an Ecosystem Management Approach (EMA)

people. Therefore, the Green Economy, as defined in this brief, has the potential for additional benefits beyond green accounting, including benefiting the poor through well-targeted investments.

The process of integrating ecosystem management concerns in development policies presents a complicated task with numerous challenges. These challenges are encountered at three stages; the procedural stage, the organizational stage and the normative stage³. Whereas some challenges are common, those faced by different countries and regions vary in scope and dimension depending on a scientific understanding of ecosystems, pressures exerted on ecosystems and the extent to which human systems are vulnerable.

1. Knowledge-gaps have been identified as one of the strongest challenges to pursuing an integrated ecosystems approach to development. A quick-win in this regard is for national and regional governments to harness knowledge and experience at the local, sectoral and national levels on ecosystems risks, impacts and vulnerability, and make the information widely available to stakeholders.
2. A second and yet very crucial challenge faced by the region is the “capacity-challenge.” In most Africa’s countries, capacity is mostly lacking in the areas of finance, human and technical resources. Quick-win solutions to this problem will be for governments to allocate more financial resources to provide more ecosystem sensitive infrastructure, provide ecosystems management related education (formally and informally), and to pursue the transfer and uptake of appropriate technologies. Participation in global ecosystems agreements will also attract Overseas Ecosystems Management Assistance (OEMA) to Africa.
3. Institutional structures and frameworks constitute one of the strongest challenges in the process of integrating ecosystems management in developmental policies. In this regard, national governments and development partners must create a supportive and compatible policy framework. This will require that all proposed and effective ecosystems-in-development policy combinations undergo and pass the “ecosystem-in-development compatibility tests” before they are adopted. This will help prevent ex- post inter- and intra-institutional conflicts. This may also imply introducing a greater measure of flexibility into the overall policy development process. Motivation of and commitment of custodians, owners and users of ecosystem resources to the ecosystem management process is another serious challenge. One way

³ Persson, A. (2008). Mainstreaming climate change adaptation into official development assistance: A case of international policy integration. Ecologic- Institute for International and European Environmental Policy

of tackling this challenge is by introducing “side-payments” for ecosystems stewardship and compliance with management rules. Barrett and Stavins (2002)⁴ sight some examples where this approach has been applied with success. Another way of introducing positive incentives is by linking compliance and participation to “third-party-issue-cooperation”. That is, stakeholders that participate and comply with the ecosystems-in-development policies will stand to benefit from cooperation in other non-ecosystems related issues (like trade, aid, etc.).

4. Other challenges include that of integrating the science, encouraging partnerships and overcoming funding restraints.

Why Do Ecosystems matter for Africa?

The Millennium Ecosystem Assessment (MEA) grouped ecosystem services into four broad categories: *provisioning*, such as the production of food and water; *regulating*, including the control of climate and disease; *supporting*, such as photosynthesis, nutrient and water cycling and crop pollination; and *cultural*, covering spiritual and recreational benefits.

Amongst several attributes, ecosystems *provide valuable adaptation mechanisms*.

Diverse examples of such nature-based solutions that remain unmeasured and unquantified include:

- Protection against flood risk⁵ for millions by naturally occurring floodplains and riparian ecosystems.
- Clean water and lower flood risk mediated by forest cover. Vegetation cover also enhances carbon sequestration.
- Replenishment of soil nutrients in agricultural systems by deep-rooted, nitrogen-fixing plants. Mangrove forests shielding of coastline from erosive forces, protection of human lives in the face of severe storms, and provision of spawning, nursery and feeding grounds for various fish species. Coral and Shellfish reefs protection of coastline from storm surges, provision of food and economic resources.
- Grasslands provision of forage for livestock and carbon sequestration in above- and below-ground biomass.

4 Barrett, S., and R. Stavins (2002). Increasing participation and compliance in international change agreement. NATA DI LAVORO 94. 2002. available at <http://www.feem.it/web/active/-wp.html>

5 Opperman et al. 2009

Institutional structures and frameworks constitute one of the strongest challenges in the process of integrating ecosystems management in developmental policies.

Ecosystems support people's well-being and can alleviate poverty

Maintaining a healthy natural resource base is critical for the benefit of all people, especially the rural poor. Millions of people in Africa live on less than \$2 per day, many of whom depend on natural resources for livelihoods and general well-being. Conserving natural resources can therefore have significant positive impacts on the welfare of those living in poverty. For example:

- Those who fish or farm for subsistence needs natural assets to survive. Sustainable production practices and harvesting of natural products can help ensure longer-term access to ecosystem services and products.
- The poor have the least ability to change if and when their way of life is threatened – i.e. least ability to relocate, change land use, alter income source, etc. Conservation or sustainable use of natural ecosystems can help buffer potential climate impacts through helping ensure provision of key services such as water purification or soil stabilization making relocation or forced migration of people less likely.
- The poor are the most likely sub-population to lack basic shelter and sanitation and therefore those most impacted by severe weather, floods and other climate hazards. Maintaining and protecting particular ecosystems can provide protection services, as mentioned previously, for vulnerable populations.

As shown in these examples, ecosystems can play a pivotal role in climate adaptation through service provision. Ecosystem services are often beneficial at a local level and/or a small-scale so conservation and restoration of natural ecosystems can help buffer the Africa's poor, who directly depend on such benefit streams accruing from ecosystem services, against impacts due to extreme weather and climate change.

Creating a Sustainable Green Economy in Africa using Ecosystems Management

A Green Economy⁶ balances natural resource values with other values, and takes into account the loss in value of ecosystem services due to environmental impacts. Thus implicit requirements for more comprehensive valuation of ecosystem services fit well with other aspirations of the Green Economy in respect of clean, renewable energy. The Green Economy provides a chance to “get the balance sheet right” by accounting for both the current and future value of the benefit ecosystems provide to people. When a watershed is deforested, it is the value of the timber and costs

⁶ A Green Economy is one that results in improved human well-being and social equity, while significantly reducing environmental and ecological scarcities.”

Ecosystem management may be defined as “an integrated process to conserve and improve ecosystem health that sustains ecosystem services for human well-being”.

incurred in harvesting that timber which is generally accounted for in the price, not the loss of clean water no longer produced by the watershed or fixation of carbon by the trees. A telling example comes from the Economics of Ecosystems and Biodiversity (TEEB) report⁷ which places the extractable value of fuel wood, timber, and non-timber products from Cameroon's tropical forests, at approximately US\$700 per hectare per year, much less than the forests' climate and flood benefits, which add up to between US\$900 and US\$2,300 per hectare per year. A Green Economy could explicitly put a value on these ecosystem services and ensure that when environmental degradation occurs, the true cost to society and people around the world is accounted for.

We do not have market prices for all of the processes and services ecosystems provide, but we have some basic starting points for some key ones such as carbon sequestration, clean water production, flood protection, grassland forage. What is still needed is an operational framework that allows for full inclusion of ecosystem values in the prices, i.e. through estimation of avoided costs associated with non-conservation, and having these reflected in market values of commodities traded in the market place. Through time we will find ways to translate this into values that can be incorporated into long-term measure of value, wealth and well-being. The essence of the Green Economy is that it recognises the sum total of all ecosystems services and how they collectively provide the complete life system support we need.

The development of the Green Economy, designed to achieve society-wide equity through consensus building, requires both top-down and bottom-up strategies. The combination of these two, in conjunction with society wide understanding of the importance of our environment, helps promote participatory processes and directs efforts towards shared goals.

For bottom-up approaches, effective green growth requires an enabling environment. A key lesson from decades of development experience is the importance of creating appropriate policies and effective institutions at all levels to support people-centred, sustainable development. Taking note of this lesson in ecosystem management is crucial to achieving the broad goals of the Green Economy, given the significant overlap between the Green Economy and Millennium Development Goals. Using small-scale approaches that decentralizes and delegates management responsibilities to local communities ensures quick implementation using local capacity and have short turnover periods. The activities of the Climate Change & Development programme (CC DARE) jointly implemented by UNEP and UNDP in Sub-Saharan Africa demonstrates how small-scale solutions can trigger new actions, empower people into self-owned actions, provide the right framework to catalyze synergies between economic development and social inclusivity.

**A Green Economy
balances natural
resource values with
other values, and
takes into account
the loss in value of
ecosystem services
due to environmental
impacts.**

⁷ TEEB (2010) The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB.

For bottom-up approaches, effective green growth requires an enabling environment. A key lesson from decades of development experience is the importance of creating appropriate policies and effective institutions at all levels to support people-centred, sustainable development.

Examples of Ecosystems Management actions paving the way towards a Green Economy in Africa

Using the CC DARE approach, crosscutting solutions to improve livelihoods in the most vulnerable communities have been provided. Although some of the examples presented here do not give direct returns in the short term, investments in training, demonstration and capacity building of local technicians and communities is expected to bear much fruit in the near future and bring economic transformation and social dimensions.

1. In Togo two dams having combined storage capacity of 94,000 m³ of water, and made it possible to rehabilitate 30 hectares of land. If the water is used to grow vegetables (Example Tomatoes), it is possible to harvest at least two crops in one year. With potential yields of 30 tons per hectare for each harvest, a farmer working a holding of one hectare can harvest 60 tons of tomatoes per year, which nets him USD 30,000. At the price of USD 0.5 per kg of tomatoes. In Seychelles 40 m³ of water was harvested from roof catchments of schools and stored in plastic tanks. In one school there was a saving on water bills of USD 250 per month. This means that in one year the school would save USD 3,000. If all the 10 schools covered by the project saved similar amounts in water bills, the intervention will save the schools from paying USD 30,000 in one year which is a big economic impact.
2. In Tanzania the project was basically centred on research and development of a manual of best practices in woodlot management. Currently farmers in Makete district earn between TAS 20,000 and 5,000,000 depending on the size of woodlot. If farmers follow and implement the guidelines that were developed in the CC-DARE project, they are able to achieve and sustain tree densities of at least 1,000 trees in one hectare. From the field investigation one mature tree can give a net profit of TAS 27,840. This means that in one hectare the farmer is able to get net profit of TAS 27,840,000.
3. In Mozambique, the project was soil erosion control and road protection against gully erosion and soil deposition on roads. This intervention is difficult to translate into direct monetary terms. However the accessibility and ease of transportation has economic significance in time saving while carrying out business. The vegetation establishment component of the project has several values including beautification of the landscape, soil erosion control, soil amendment through organic matter build up and carbon sequestration.

It is important that the mix of bottom-up and top-down strategies are structured

in a co-ordinated way so as to be complementary and 'meet' in a seamless fashion. The 'remit' therefore for the Green Economy must also ensure that clear global level objectives are set out in order to provide common targets on which the mix of strategies can work towards.

Recommendations for putting Ecosystems Management in the Vision of Africa's Development

For stakeholders in and out of Africa to adopt an integrated ecosystems approach to development, what is first required is a change in the way that stakeholders view nature, science and politics. To begin with, it requires a re-examination of the region's institutions (traditional/modern), cultural norms, religious beliefs and practices. Within this logic, five requirements concerning institutional innovations are identified as follows:

1. Develop an Africa Ecosystem Research Network with core functions of monitoring, research, demonstration, policy support and capacity building. This will help enhance the capacity of scientists and policy makers in Africa for sustainable management of their ecosystems and livelihoods. The development of this Network should build upon existing infrastructure for ecosystem monitoring and research and draw its lessons from existing continent-wide research networks.
2. Review of existing laws, policies and regulations: while existing laws may contain fragments of ecosystem management concepts, there are still significant barriers to be confronted. For instance, national laws dealing with natural resource management and environmental quality tend to delineate and equate ecosystems with convenient administrative boundaries that bear no relationship with ecological structures. Also most laws and institutions separate natural resource management and economic management into different categories.
3. Legislative reforms should address overlapping jurisdictions, fragmentation of authority and conflicting sectoral objectives which stand in the way of efforts to adopt an ecosystems approach to development. An economic valuation of the costs and benefits of an integrated ecosystem management approach to development: the economic dimensions of ecosystems management must be better addressed. While recognizing that it is not always easy to place economic values on ecosystems functions, the costs of both adopting and not adopting an ecosystem approach needs to be defined. Further, an analysis of

The development of the Green Economy, designed to achieve society-wide equity through consensus building, requires both top-down and bottom-up strategies.

For stakeholders in and out of Africa to adopt an integrated ecosystems approach to development, what is first required is a change in the way that stakeholders view nature, science and politics.

the role that economic institutions, specifically ‘the market’, plays in promoting the adoption of ecosystems management on both public and private domains is needed. Ultimately, there is the need to clarify the relationship between economic growth and ecosystems sustainability in Africa.

4. An institutional mechanism for managing ecosystems across jurisdictions in the regions: It is rare to find an ecosystem wholly contained on a single ‘owner’s domain’. The multiple scales of ecosystem management require cooperation among a broad range of interests as well as improved inter-organizational coordination. What is required is to design institutions and cooperative approaches to management that cut across these jurisdictional boundaries. Efforts to manage ecosystems divorced from ownership realities are equally ineffectual; therefore, to implement an integrated ecosystem management, there is need for the inclusion of private landowners.
5. Strengthen the knowledge base in Africa, its international dimension, research infrastructure and the connection between science and policy.
6. Greater Commitment from member states to propose, designate, protect and effectively manage ecosystems.
7. Strengthening of coherence and synergy between trade and development corporations.

Conclusions

Ecosystem Management is an essential part of the ‘tool kit’ for tackling climate change and making progress towards long-term economic sustainability in Africa. The greatest challenge for Africa’s countries is to adjust their national economies in line with mitigation and adaptation efforts whilst maintaining financial and social stability. Use of the climate regulation capacity and other life support services of ecosystems can help economies, financial institutions and societal behaviour to make those adjustments in a transition towards a green low carbon economy. Embracing the Ecosystem Management principles set out in this paper will provide the enabling conditions to realize this local potential, in partnership with national and regional efforts, to succeed in crafting their own solutions to the environmental challenges we all face today.





United Nations Environment Programme
P.O. Box 30552 Nairobi 00100 KENYA
Tel: +254-20-762 3753
Fax: +254-20-762 3917
Email: depi@unep.org
Website: www.unep.org/depi