

Sustainable use of Urban Natural Assets: *for Sub-Saharan Africa*



URBAN NATURAL ASSETS FOR AFRICA



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ICLEI – Local Governments for Sustainability – Africa Secretariat
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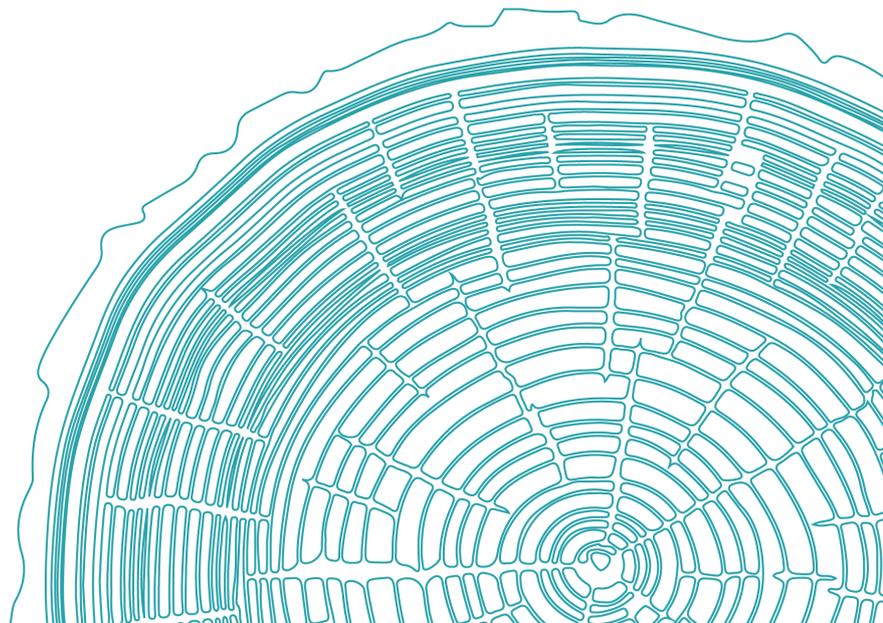
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Introduction

Africa's landscape is a mosaic of natural assets including amongst others, forests and woodlands, grasslands, freshwater ecosystems and coastal lands. These natural resources drive the economy as well as other human activities. However, rapid population growth and high rates of urbanisation, which lead to agricultural expansion, overfishing, overharvesting, invasive alien species and the loss of habitats, are threatening the goods and services that these natural resources provide (UNEP, 2013). In Africa, pressures on natural resources are only expected to intensify, as the majority of the world's population growth in the near future is projected to take place on the African continent. Of the 2.4

billion additional people that are estimated to be added to the planet between 2015 and 2050, approximately 1.3 billion will be added in Africa. Africans also face additional challenges of traditional practices that rely heavily on natural assets for their livelihoods. In the face of these significant pressures, there is a need for innovative and alternative strategies to ensure sustainable use of natural assets. This handbook provides insight on such strategies and examples of sustainable approaches to use urban natural assets to generate livelihoods.



[See more benefits from nature in urban life by clicking here](#)

1

Urban Forests

Approximately 675 million hectares of land in Africa contains forests, which amounts to roughly 23% of Africa. In spite of the growing awareness about the importance of forests, deforestation and forest degradation are occurring at rapid rates in many parts of Africa, particularly in West and East Africa¹.

Deforestation is expected to accelerate as demand for food and fuel from a rapidly growing human population². Therefore, the livelihood strategies relating to forests highlighted in the proceeding section focus on alternative means of generating household energy.

1.1 The value of forests

Forests in Africa have a number of interrelating social, economic and environmental benefits, some of which are:

- Housing and the protection of biodiversity, which in turn contributes to the tourism industry
- Improve soil quality
- Water filtration, absorption and flood protection
- Climate regulation

- Creation and provision of products such as food, fuelwood and charcoal to create household energy, medicine³

1.2 Major threats to forests

- Over-harvesting of wood for energy
- Urban sprawl
- Conversion of forests for other land uses such as agriculture, settlements, roads and infrastructure.

Effects of deforestation and forest degradation:

- Reduced biodiversity
- Release of greenhouse gas emissions
- Disrupt water cycle
- Increased soil erosion
- Disrupted livelihoods

1 Aleman, J.C., Jarzyna, M.A. & Staver, A.C. 2017. Forest extent and deforestation in tropical Africa since 1900. *Nature Ecology & Evolution*, 2: 26-33.

2 Tilman, D., Balzer, C., Hill, J. & Befort, B. L. 2011. Global food demand and the sustainable intensification of agriculture. *Proceedings of the National Academy of Sciences of the United States of America*, 108, (50): 20260-20264.

3 O'Brien, L., De Vreese, R., Kern, M., Sievānend, T., Stojanovae, B. & Atmiş, E. 2017. Cultural ecosystem benefits of urban and peri-urban green infrastructure across different European countries. *Urban Forestry and Urban Greening*, 24: 236-248.



Africa is home to

17%

of the world's
forests

(African Wildlife
Foundation, 2015)



65%

of people in
sub-Saharan Africa
depend on forests
for things like food
and fuel

(African Wildlife
Foundation, 2015)

1.3 Sustainable use of forests

Forests are an important source of livelihood in Africa. Therefore innovative solutions and the need for urgent action is required to ensure they continue to provide critical ecosystem services while meeting the growing demands of Africa's human population.

1.3.1. Raising awareness about the value of urban forests

Forests, as mentioned, provide a number benefits, especially in urban environments. Sharing information with the public about the value of forests can help individuals make wise land-use decisions that ultimately can help conserve and protect forests ⁴.

1.3.2. Charcoal production from agricultural waste rather than forest wood

Charcoal production continues to be an important economic activity as many people rely on this natural resource to support their livelihood in terms of job creation and income generation. Therefore, more efficient energy sources need to be established in order to reduce the rate at which forest trees are being exploited. For example, the production of charcoal using agricultural waste provides an ideal alternative cooking fuel to cutting down trees for fuel wood. Charcoal produced from

agricultural waste, namely sugarcane trash, sawdust and grass to name a few, is healthy, economic and environmental-friendly. As a result, producing briquette charcoal from agricultural waste can be a source of income for community members⁵.

1.3.3. Wonder Bag

Wonderbag is a simple, well insulated, non-electric and portable slow cooker. It is made with a shweshwe type of fabric and insulated with polyurethane (PU) foam with a fire retardant solid foam base. The use of a Wonderbag reduces people's dependence on fuel sources, from electricity and propane to firewood. As such, this reduces the cost and strain on the environment resulting in reduction of carbon dioxide (CO₂) emissions and reducing deforestation activities ⁶.



4 World Wide Fund (WWF). 2018. Forest solutions. [Online]. Available: <http://forestsolutions.panda.org/> [July 2019].

5 For more information on the material of methods of producing briquette charcoal using agricultural waste see Bogale, W. 2009. Preparation of Charcoal Using Agricultural Wastes. Ethip. J. Educ. & Sci. 5(1): 79-93.

6 To find out more about how to use a wonderbag, visit <https://thewonderbagshop.co.za/>

1.3.4. Beekeeping

Organic beekeeping can provide a financially appealing alternative for those who would otherwise earn cash through cutting down trees and in turn can aid in reducing deforestation rates in African countries. The practice of beekeeping is widespread across many regions in African countries, such as Tanzania⁷, Uganda and Ethiopia⁸. Not only is there evidence of beekeeping offering people a way of generating additional or alternative sources of income, but beekeeping has also been acknowledged for a number of other benefits. For example, Hall (2015), states that "bees have been praised by the Tanzanian government for playing a major role in improving biodiversity and increasing crop yields through pollination."

For more information about basic techniques and ideas needed to start beekeeping, have a look at the [Basic Beekeeping manual](#) written by Gregory (2011) for people in sub Saharan Africa. The guide contains coloured pictures with few words, covering basic techniques needed to start a beekeeping business. It also offers some new ideas to help beekeepers become independent by making their own equipment from local materials. Therefore, it is important to establish beekeeping in forestry activities as a way of strengthening sustainable use



*"I was taught to make beehives from local materials. Honey bees occupied the beehives by themselves – they cost me nothing. **The bees feed on my trees and give me honey. I have invested little and gained much.***

*Now my neighbours want to copy me. **Now I will plant trees.** Trees give me honey today and timber in the future."*

– Stephen Walimbe, participant in Uganda, Bees for Development (2018)



1.3.5. Planting woodlots for access to wood

Woodlots are important sources of income to local communities and serve as an alternative protection to urban forests. They have very localised effect on the supply of firewood to the households for their personal use or as an income support system. As such, it is important to establish planting of

woodlots initiatives in local communities as a way of reducing forest overexploitation for firewood, at the same time providing a livelihood system that is sustainable for the people who depend on this resource.

7 Hall, M. 2015. An army of bees takes on deforestation in Tanzania. DW. [Online]. Available: <http://www.dw.com/en/an-army-of-bees-takes-on-deforestation-in-tanzania/a-18535856> [27 March 2018].

8 Bees for Development. 2018. Where we work. [Online]. Available: <http://www.beesfordevelopment.org/where-we-work/> [27 March 2018].

2 Urban Wetlands

Wetlands are one of the most valuable and diverse ecosystems on the planet and are essential for human existence. In simple terms, a wetland is a landscape feature which is saturated with water for a long enough period that the soil conditions change and the vegetation shifts to respond to these changes.

2.1 The value of wetland

Wetlands are one of the most undervalued natural assets but provide a range of vital services, some of which are listed below ⁹

- Source of food
- Filter waste water
- Control/ reduce flooding
- Soil formation
- Enable people to earn a living (a livelihood source)
- Improve air quality
- Promote human wellbeing
- Offer unique habitat for many different animals

2.2 Major threats to wetland

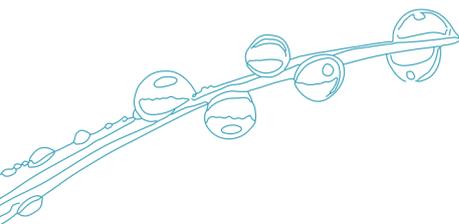
- Urban development and expansion;
- draining water
- Pollution and dumping in wetlands
- Encroachment of invasive alien species
- Converting and using land for agricultural purposes



Despite covering only **6.5%** of the Earth's land surface, wetlands provide a disproportionately high

40% of global ecosystem services."

(Edwards et al., 2018: 19)



9 Wetlands International. 2018. [Online]. Available: <http://africa.wetlands.org/Africanwetlands/Seasonalwetlands/tabid/2941/language/en-GB/Default.aspx> [2 February 2018].

2.3 Sustainable use of wetlands

Given that wetlands are unique and valuable, it is essential that they are conserved and protected. There are a number of ways to ensure the sustainable use of wetlands, some of which are discussed below .

2.3.1. Raising awareness about the value of wetlands

One of the reasons why wetlands are increasingly threatened and not considered in land use planning is due to limited awareness and understanding of the value of wetlands coupled with limited access to wetland information for cities. Therefore, there is a need to raise awareness and enhance the understanding of the value of wetlands in African cities. Awareness raising can be done in various ways:

- Multi-stakeholder workshops (e.g. See the awareness raising done in Ehlanzeni District Municipality in SA through the LAB: Wetland SA project ¹⁰)
- Community Training and Enterprise Development
- Capacity Building

Sharing information with the public about the value of wetlands can help individuals make wise land-use decisions that can help conserve and protect wetlands.

10 CELI CBC. 2019. Local Action for Biodiversity: Wetlands South Africa. [Online]. Available: <https://cbc.icei.org/project/lab-wetlands-sa/#1527138845364-f91e6541-6842>

11 For an example, see WWF: Rehabilitation in the Riversonderend Catchment in the Overberg District Municipality, South Africa, in Robinson (2017) and the rehabilitation programme known as Working for Wetlands

2.3.2. Rehabilitation/ restoration of wetlands

Wetland rehabilitation and restoration activities aim to improve the condition and functionality of the wetland ecosystem as a whole and ultimately should address the causes and effects of degradation. The benefits accruing from wetland rehabilitation include, improved livelihoods, increase biodiversity, further improve water quality, reduce impacts of flooding, and the protection of resources. As such, rehabilitating and restoring our wetlands will result in adequate provision of grazing for cattle and sheep and provision of reeds for building and weaving ¹¹.

2.3.3. Community clean-up

Wetland clean-ups are not just for the young, everyone can get involved in wetland clean-ups and provide a great opportunity for the community to get involved in taking care of their natural assets and to learn about the value of wetlands. Communities obtain both direct and indirect benefits and services from urban wetlands. For example, a community wetland clean-up may provide an indirect benefit such as the establishment of a composting business opportunity through the removal of waste from urban wetlands. The compost can therefore be sold to various agricultural practices as soil fertilisers or community members can use it to grow food crops in their own backyards.



2.3.4. Establishing Recreational uses of wetlands

Recreational use is one of the benefits that urban wetlands provide, and these have a strong connection to the human health. Wetlands provide recreational areas for people, where they can go relax and appreciate nature. They can also be used for water sport, fishing and bird watching. This indicates the importance of establishing recreational opportunities around and within wetlands, which will result in the sustainable use of wetlands as they positively affect both human physical and psychological well-being¹⁴.

Below are tips for establishing community wetland clean-ups¹²:

1. Choose a focus area for your clean-up
2. Make a detailed event plan
3. Choose an enthusiastic leader who will be the go-to-person
4. Recruit volunteers early
5. Get supplies donated
6. Assign specific tasks during the clean-up
7. Make a Plan for Debris Removal at the clean-up site
8. Reward your volunteers¹³.



¹² Paynter, M. 2018. How to plan a community clean-up. [Online]. Available: <https://www.budgetdumpster.com/blog/organize-successful-community-cleanup/> [5 February 2019].

¹³ For more information see Paynter, M. 2018. How to plan a community clean-up. [Online]. Available: <https://www.budgetdumpster.com/blog/organize-successful-community-cleanup/> [5 February 2019].

¹⁴ For more information on wetlands and how to take care of them (on- and off site) take a look at the Taking Care of Wetlands: Why and How document by WWF-SA (2008) here: https://www.iwrm.co.za/resource%20doc/od_diverse_docs/october_2008_updates/wua_eco_capacity_building%20Booklets_08/wr_1wetlands.pdf

3 Urban Rivers

“Rivers are the arteries of our planet”¹⁵. They have played an important and life-sustaining role in human societies for thousands of years, which is why many of the world's great cities are situated on the banks of a great river. We love our rivers and we abuse them. We have used them as a source of water, for food, for transport, for recreation, as defences, as a “Rivers are the arteries of our planet”¹⁶.

Rivers have played an important and life-sustaining role in human societies for thousands of years, which is why many of the world's great cities are situated on the banks of a great river. Therefore, it is vital to protect our rivers.

3.1 The value of rivers

Rivers provide great value to people, economically, socially and environmentally some of which are listed in the following:

- Recreational activities
- Water supply

- Water regulation
- Improve air quality
- Means of transportation
- Productive habitats for certain species

3.2 Major threats to rivers

As cities grow so does their need for water. The increase in demand results is accompanied by increasing abstraction from rivers. Rapid population growth and urbanisation is significantly changing the water quantity and quality of rivers¹⁷.

- Urban development and expansion;
- draining water
- Pollution and dumping in wetlands
- Encroachment of invasive alien species
- Converting and using land for agricultural purposes¹⁸

15 WWF. 2018. About freshwater. [Online]. Available: http://wwf.panda.org/about_our_earth/about_freshwater/rivers/ [19 March 2018].

16 WWF. 2018. About freshwater. [Online]. Available: http://wwf.panda.org/about_our_earth/about_freshwater/rivers/ [19 March 2018].

17 Petts, G., Heathcote, J., & Martin, D. 2002. Urban Rivers: Our inheritance and future. UK: IWA Publishing and Environmental Agency.

18 IUCN Red List of Threatened Species. 2017. Freshwater. [Online]. Available: <http://www.iucnredlist.org/initiatives/freshwater/panafrica/threats> [19 March 2018].

“Rivers have always been at the **heart of city life**; the control of their waters was a key to the building of human society.”

(Petts, Heathcote & Martin, 2002)

The world could face

40%

water deficit by 2030

under a business-as-usual scenario.

3.3 Sustainable use of rivers

Rivers are an important source of livelihood in Africa. Below are some solutions to address challenges faced by rivers.

3.3.2. Composting

Most of urban waste end up in river systems, degrading their quality and provided ecosystem survives. Communities can therefore use waste removed from rivers and convert it into compost which can be used to grow food crops .

Compost has a number of benefits, of which the key one is its ability to improve soil, which in turn means the quality of agriculture produce planted will improve^{20, 21}.

3.3.1. Eco-bricks

Many developing countries are faced with a challenge of rivers and canals clogged with dense masses of waste, particularly plastic packaging. As such, the Ecobrick solution has been implemented in various cities across the world to utilise plastic in a manner that does not harm the environment. This approach aims to encourage people to stuff plastic food packaging into plastic bottles, which can then be used as building materials to create sustainable products such as furniture, garden spaces, as well as buildings. As a result, this practice minimises the number of toxic plastic entering river systems¹⁹.



How to make an Eco-brick



19 For more information on how to make an eco-brick, visit [ecobrick.org](https://www.ecobricks.org/) (<https://www.ecobricks.org/>) or [ecobrick exchange](https://ecobrickexchange.org/views/home.php#about) (<https://ecobrickexchange.org/views/home.php#about>).

20 More information on how compost can improve soil, in Edward, S. & Araya, H. How to make and use compost. [Online]. Available: <http://www.fao.org/docrep/014/i2230e/i2230e14.pdf> [3 October 2018].

21 For more information about composting and tips for successful composting visit [eartheasy](https://learn.eartheasy.com/guides/composting/#howtocompost). 2018. How to compost. [Online] <https://learn.eartheasy.com/guides/composting/#howtocompost> [3 October 2018].

4 Urban Estuarine and coastal systems

Urban Estuarine and Coastal Ecosystems (ECEs) are among the most heavily used and threatened urban natural assets across the world. Human activities continue to intensely deteriorate the status of these natural assets. As such, it is important to protect and use them in a sustainable manner.

4.1 The value of estuarine & coastal ecosystems

Coastal ecosystems support a large portion of the world's most vulnerable communities, many of which rely on the provision of this natural asset for both food and livelihoods. Estuarine and coastal ecosystems including salt marshes, mangroves, nearshore coral reefs, seagrass beds, and sand beaches and dunes, have a number of important benefits to society, some of which include:

- Pollution control (especially mangroves)
- Erosion control (salt marshes)
- Provision of habitats and breeding grounds for fish (coral reefs, mangroves and seagrasses)
- Storm protection (coral reefs and mangroves)

4.2 Major threats to estuarine & coastal ecosystems

Even though the coastal zones plays an important part in the provision of valuable goods and services, it is also vulnerable and sensitive to both climatic and human impacts. Estuarine and coastal systems are some of the most heavily used and threatened natural systems globally²². Degradation of coastal ecosystems is primarily the result of:

- Plastic pollution
- Pollution from over enrichment of nutrients
- Metal and organic pollutants
- Urban development encroachment
- Climate change impacts

“Mangroves are among the world’s most threatened vegetation types.”

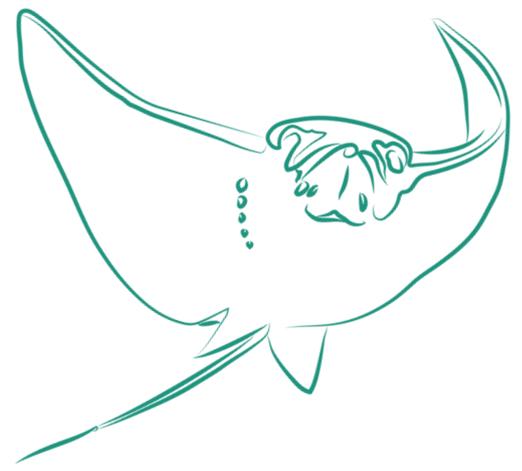
(Chevallier, 2013)



²² Barbier, E.B., Hacker, S.D., Kennedy, C., Kock, E.W., Stier, A.C., & Silliman, B.R. 2011. The value of estuarine and coastal ecosystem services. *Ecological Society of America*, 81(2): 169-193.

4.3 Sustainable use of estuarine & coastal ecosystems

The coastal zone is essential to countries' economies and sustaining of many local communities livelihoods. The decline in estuarine and coastal ecosystems also affect many critical benefits to life on earth. Given the importance of the good and services coastal ecosystems provide to humans, sustainable use and protection of these resources is essential.



4.3.1. Raising awareness about the value of estuarine and coastal ecosystems

Estuarine and coastal ecosystems (mangroves, estuaries, coral reefs and seagrass beds), are complex and inter-dependent and yield a number of ecosystem goods and services, which are utilised by people for food, incomes, fuel and construction. As such, there needs to be increased efforts by ecologists to promote their insights with government officials and the public, in order to raise awareness on the importance of these natural assets in terms of their critical benefits and values, as well as the threats.

4.3.2. Restoration and replanting of mangroves

Mangroves are one of the most important coastal ecosystem that continue to be degraded by human activities and climate change. They provide many benefits such as shelter for juvenile fish, protection of shorelines from erosion, sediment and pollution filtration out of rivers, and their wood products can be used for timber and fuel. Therefore, it is important to give priority to rehabilitating mangroves to ensure sustainability of the coastal zone development, eco-tourism development and recreational fisheries development.





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