

Embracing Nature Based Solutions for Sustainable Development in Kenya

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Abstract

The paper critically discusses the role of Nature Based Solutions (NbS) in the attainment of Sustainable Development in Kenya. It defines the concept of Nbs and discusses its relationship with Sustainable Development. The paper argues that NbS are integral in the Sustainable Development agenda since they provide eco-friendly measures that are effective and adaptable in addressing societal challenges such as climate change, food and water security and human health. The paper argues case for the adoption of NbS towards attainment of Sustainable Development in Kenya.

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1. Introduction

Nature-based Solutions (NbS) have been defined as actions to protect, sustainably manage and restore natural or modified ecosystems, which address societal challenges such as climate change, food and water security and natural disasters effectively and adaptively, while simultaneously providing human well-being and biodiversity benefits¹. They adopt the use of ecosystems and their services towards addressing societal challenges². NbS are therefore actions inspired by, supported by or copied from nature³. It has been asserted that nature based solutions have significant yet underutilized potential to address global threats including climate change, loss of biodiversity, food and water security, human health and natural disasters⁴. NbS are informed by benefits that arise from healthy ecosystems and are critical to sustainable development⁵.

The concept of NbS emerged due to the need for solutions that worked with ecosystems⁶. Prior to development of this concept, most mechanisms adopted towards mitigating global challenges relied on conventional science and technological approaches such as engineering interventions⁷. NbS seeks to mitigate this gap by adopting eco-friendly approaches towards mitigating global social, environmental and economic concerns. They are intended to support the attainment of the development goals of a society while safeguarding human well-being through measures that reflect societal and cultural

¹ International Union for Conservation of Nature, 'Nature-Based Solutions' available at <https://www.iucn.org/our-work/nature-based-solutions> (accessed on 16/09/2022)

² Cohen-Shacham et al., 'Nature-Based Solutions to address Global Societal Challenges' available at <https://portals.iucn.org/library/node/46191> (accessed on 16/09/2022)

³ Scott. M et al., 'Nature-based solutions for the contemporary city/Re-naturing the city/Reflections on urban landscapes, ecosystems services and nature-based solutions in cities/Multifunctional green infrastructure and climate change adaptation: brownfield greening as an adaptation strategy for vulnerable communities?/Delivering green infrastructure through planning: insights from practice in Fingal, Ireland/Planning for biophilic cities: from theory to practice, (2016) *Planning Theory & Practice*, 17:2, 267-300

⁴ IUCN, 'Ensuring Effective Nature Based Solutions' available at <https://www.iucn.org/resources/issues-brief/ensuring-effective-nature-based-solutions> (accessed on 16/09/2022)

⁵ UK Pact., 'Nature-Positive Actions: Lessons from Forests' available at https://apps.worldagroforestry.org/downloads/Publications/PDFS/nature_positive_actions.pdf (accessed on 16/09/2022)

⁶ Cohen-Shacham et al., 'Nature-Based Solutions to address Global Societal Challenges' Op Cit

⁷ Ibid

values and promote resilience of ecosystems⁸. NbS thus provide simultaneous benefits to the environment, the society and the economy.

The paper seeks to critically discuss the role of Nature Based Solutions in the attainment of Sustainable Development in Kenya. It examines the nexus between Nature Based Solutions and Sustainable Development. The paper then proposes interventions towards addressing current concerns in Kenya including climate change, food and water security and loss of biodiversity through Nature Based Solutions in the quest towards Sustainable Development.

2. Nature Based Solutions and Sustainable Development

Sustainable Development was defined in the *Report of the World Commission on Environment and Development: Our Common Future* as development that meets the needs of the present without compromising the ability of future generations to meet their own needs⁹. Sustainable Development entails a combination of elements including environmental protection, economic development and social issues¹⁰. The concept of Sustainable Development has emerged as the global blueprint for development as envisioned by the Sustainable Development Goals. The Sustainable Development Goals (SDGs) were adopted by United Nations member states in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by the year 2030¹¹. The 2030 Agenda for Sustainable Development entails a shared blueprint for peace and prosperity for people and the planet for both the present

⁸ Ibid

⁹ World Commission on Environment and Development, *Our Common future*. Oxford, (Oxford University Press, 1987).

¹⁰ Fitzmaurice, M., 'The Principle of Sustainable Development in International Development Law' *International Sustainable Development Law*, Vol. 1

¹¹ United Nations General Assembly, *Transforming our World: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1

and future generations¹². This approach contains both an anthropocentric approach that focuses on human development and an ecocentric approach that focuses on environmental conservation and further incorporates elements of inter and intra generational equity¹³. The Rio Declaration captures the concept of inter and intra generation equity and sets out that the right to development must be fulfilled in order to equitably developmental and environmental needs of present and future generations¹⁴.

Nature Based Solutions are integral to the Sustainable Development agenda since they adopt an ecosystem-based approach to mitigate and adapt to climate change, while also improving livelihoods and biodiversity¹⁵. Achieving most of the Sustainable Development Goals such as food security, clean water and sanitation and combating climate change may necessitate the adoption of nature based ecosystem approaches. The ecosystem approach towards Sustainable Development has been recognized in a number of legal instruments. The *Convention on Biological Diversity* seeks to promote the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilization of genetic resources¹⁶. The Convention advocates for the use of traditional knowledge and customary approaches towards sustainable use and conservation of biological diversity¹⁷. Traditional Ecological Knowledge is an essential component on Nature Based Solutions.

Further, the *United Nations Framework Convention on Climate Change*¹⁸ recognizes the role of nature in mitigating the effects of climate change. The Convention seeks to achieve a climate change mitigation framework that allows ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic

¹² United Nations, Department of Economic and Social Affairs, 'Sustainable Development' available at <https://sdgs.un.org/goals> (accessed on 26/04/2022)

¹³ Muigua. K., 'Nurturing Our Environment for Sustainable Development' Glenwood Publishers Limited, 2016

¹⁴ Rio Declaration on Environment and Development, A/CONF.151/26 (Vol. I), Principle 3

¹⁵ Cousins. J., 'Justice in Nature-Based Solutions: Research and Pathways' *Ecological Economics* (2021) 180

¹⁶ Convention on Biological Diversity (1992), 1760 UNTS 79

¹⁷ Ibid, article 8 (j)

¹⁸ United Nations Framework Convention on Climate Change, United Nations, 1992

development to proceed in a sustainable manner¹⁹. The *Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)*²⁰ seeks to promote the conservation and sustainable use of wetlands and calls for the establishing of nature reserves on wetlands²¹. In addition, the *African Convention on the Conservation of Nature and Natural Resources*²² seeks to enhance environmental protection; to foster the conservation and sustainable use of natural resources; and to harmonize and coordinate policies with a view to achieving ecologically rational, economically sound and socially acceptable development policies and programmes²³. Nature based solutions are thus integral in the Sustainable Development agenda.

¹⁹ Ibid, Article 2

²⁰ Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, 2.2. 1971)

²¹ Ibid, Article 4

²² African Union, *African Convention on the Conservation of Nature and Natural Resources*, OAU, 1001 UNTS 3.

²³ Ibid, Article 1

3.0 Embracing Nature Based Solutions for Sustainable Development in Kenya

Nature based solutions represent viable and eco-friendly solutions towards addressing societal challenges²⁴. The following measures can be adopted towards embracing nature based solutions for Sustainable Development in Kenya.

3.1 Climate Change Mitigation

Sustainable Development Goal 13 calls upon nations to take urgent action to combat climate change and its impacts²⁵. Among the targets under this goal is strengthening resilience and adaptive capacity to climate related hazards and natural disasters in all countries and integrating climate change measures into national policies, strategies and planning²⁶. Climate change is arguably one of the most fundamental global concerns at the moment. Alive to this challenge, the *Paris Agreement*²⁷ was adopted with the aim to strengthen the global response to the threat of climate change in the context of Sustainable Development and efforts to eradicate poverty. The Agreement aims to achieve this through inter alia holding the increase in the global average temperature and increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production²⁸.

Nature Based Solutions can play an important role in climate change mitigation by preventing the degradation and loss of natural ecosystems²⁹. Degradation and loss of natural ecosystems makes them susceptible to adverse effects of climate change. This can be caused by deforestation and forest degradation and poor land use practices. These practices increase carbon emissions into the atmosphere increasing the risk of climate

²⁴ Seddon, N, et al. "Understanding the value and limits of nature-based solutions to climate change and other global challenges." *Philosophical Transactions of the Royal Society B* 375.1794 (2020)

²⁵ United Nations, Sustainable Development Goals, available at <https://sdgs.un.org/goals/goal13> (accessed on 16/09/2022)

²⁶ Ibid

²⁷ Paris Agreement, United Nations, 2015

²⁸ Ibid, Article 2

²⁹ Cohen-Shacham et al., 'Nature-Based Solutions to address Global Societal Challenges' Op Cit

change³⁰. Nature based solutions can be adopted through restoration, conservation and sustainable use of land, wetlands, forests and ocean ecosystems towards climate change mitigation³¹.

Good farming practices such as the use of organic manure can help improve crop yields without increasing carbon emissions³². Further, a move towards plant-based diets can help reduce land demand and emissions³³. In addition, practices such as agroforestry and reforestation can help to sustainably manage and restore ecosystems with the aim of increasing productivity and resilience to climate change³⁴. Nature Based Solutions thus have a role to play in increasing resilience to climate change impacts in both the short term and long term³⁵. The efficacy of nature based solutions in mitigating the effects of climate change is dependent on the resilience of the ecosystem and the extent of the impacts of climate change³⁶.

In Kenya, the Climate Change Act recognizes the role of indigenous knowledge related to climate change mitigation and adaptation³⁷. This knowledge can be harnessed in order to promote sound agricultural practices and protection of biodiversity including forest ecosystem which is critical in climate change mitigation and adaptation³⁸.

³⁰ Ibid

³¹ Ibid

³² Miles. L et al., 'Nature-Based Solutions for Climate Change Mitigation' available at <https://www.unep.org/resources/report/nature-based-solutions-climate-change-mitigation> (accessed on 16/09/2022)

³³ Ibid

³⁴ Ibid

³⁵ Ibid

³⁶ United Nations Environment Programme., 'Nature-Base Solutions for Climate Change Mitigation' available at <https://www.unep.org/resources/report/nature-based-solutions-climate-change-mitigation> (accessed on 16/09/2022)

³⁷ Climate Change Act, No. 11 of 2016, S 13 (5) (g)

³⁸ Apraku. A, John. M & Apraku. G "Climate change and small-scale agriculture in Africa: Does indigenous knowledge matter? Insights from Kenya and South Africa." *Scientific African* 12 (2021)

3.2 Food Security

Sustainable Development Goal Number 2 seeks to achieve food security by seeking to end all forms of hunger and malnutrition by the year 2030³⁹. The United Nations has identified various targets towards achieving this goal including ensuring sustainable food production systems and implementing resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality⁴⁰. Food insecurity is an urgent concern across the globe especially in developing countries⁴¹.

In the recent past, technological approaches towards food production have proved to be insufficient in improving food security as demonstrated by ongoing global food challenges⁴². Nature Based Solutions can thus be adopted in enhancing food security through protecting wild genetic resources, managing wild species such as fish and providing water for irrigation⁴³. It has been asserted that in Kenya, food security policies need to be conceived within the more integrated context of sustainable rural development and therefore consider linkages with issues such as environmental and natural resource management, poverty reduction, economic growth, human health, and social and gender equity⁴⁴. Approaches that have been adopted to increase food production in Kenya include maize-legume intercropping among many agricultural communities in Kenya⁴⁵.

³⁹ United Nations, Sustainable Development Goals, available at <https://www.undp.org/sustainable-development-goals#zero-hunger> (accessed on 16/09/2022)

⁴⁰ Ibid

⁴¹ Hickey. G et al., 'Challenges and Opportunities for Enhancing Food Security in Kenya' Food Sec. (2012) 4:333-340

⁴² Ibid

⁴³ Cohen-Shacham et al., 'Nature-Based Solutions to address Global Societal Challenges' Op Cit

⁴⁴ Hickey. G et al., Op Cit

⁴⁵ Muna. M & Mugendi. D., 'Increasing Productivity through Maize-Legume Intercropping in Central Kenya' available

There is immense potential for the use of nature based solutions to enhance food availability, access and use in Kenya.

3.3 Water Management

Access to clean and safe water is a fundamental human right. In Kenya, this right has been enshrined under the Constitution⁴⁶. The United Nations estimates that more than 40% of the global population experiences water scarcity a situation likely to be worsened due to adverse effects of climate change brought about by drought and desertification⁴⁷. Sustainable Development Goal 6 seeks to achieve the universal goal of clean water and sanitation through measures such as improving water quality by reducing pollution, implementing integrated water resources management at all levels and protecting and restoring water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes⁴⁸. Nature Based Solutions can aid in achieving these targets and promoting access to clean water and sanitation.

Nature based solutions can be used in water management through the planned and deliberated use of the ecosystem to improve water quality and quantity through mechanisms that also enhance resilience to climate change⁴⁹. It has been correctly pointed out that nature plays an important role in water management through ways such as reducing the impact of heavy rainfall by vegetation cover thus reducing soil erosion and pollution, holding of water by wetlands and accumulation of large volumes of water by flood plains during extreme events⁵⁰. Nature Based Solutions can thus be adopted

at https://www.researchgate.net/publication/262679891_Increasing_Productivity_Through_Maize-Legume_Intercropping_in_Central_Kenya (accessed on 16/09/2022)

⁴⁶ Constitution of Kenya, 2010, Article 43 (1) (d)

⁴⁷ UNDP, Sustainable Development Goals, Goal 6- Clean Water and Sanitation, available at <https://www.undp.org/sustainable-development-goals#clean-water-and-sanitation> (accessed on 16/09/2022)

⁴⁸ Ibid

⁴⁹ UNEP., Water Based Solutions for Water Management, available at <https://wedocs.unep.org/handle/20.500.11822/32058> (accessed on 16/09/2022)

⁵⁰ Ibid

through Integrated Water Resources Management to protect, restore and extent water services⁵¹.

Integrated Water Resources Management balances various concerns including water use between socio-economic activities and ecosystems⁵². It has been lauded as an effective alternative to the traditional approaches to water and wetlands resources governance. This can be achieved through various ways including management of water resources along natural catchment/basin boundaries, embracing a participatory approach for better use of water resources, treatment of effluents and re-use and recycling of water⁵³. Nature Based Solutions thus have a role to play in water management towards achieving access to clean and safe water.

3.4 Promoting Human Health

Among the aims of the Sustainable Development Goals is to promote good health and well-being for all persons⁵⁴. It has been argued that the natural environment including the ecosystem, climate and biodiversity are key determinants of human health and well-being⁵⁵. To this extent, it has been pointed out the green space provided by the natural environment can improve human health and well-being through since it enhances air quality and regulation of heat and noise⁵⁶. Further, the natural environment can enhance spiritual and mental being typically through experiences in remote green spaces⁵⁷. Further, ecosystems such as forests have for a long time been a source of herbal medicine

⁵¹ Ibid

⁵² Muigua.K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya' Glenwood Publishers Limited, 2015, Pg 53

⁵³ Ibid

⁵⁴ UNDP, Sustainable Development Goals- Goal 3, Good Health and Well-Being, available at <https://www.undp.org/sustainable-development-goals#good-health> (accessed on 16/09/2022)

⁵⁵ Naeem. S et al., 'Get the Science Right When Paying for Nature's Services.' *Science* 347(6227): 1206–1207.

⁵⁶ Hartig. T et al., 'Nature and Health.' *Annual Review of Public Health* (2014) 35: 207–28.

⁵⁷ Cohen-Shacham et al., 'Nature-Based Solutions to address Global Societal Challenges' Op Cit

especially among indigenous communities⁵⁸. Nature based solutions are thus essential in promoting human health.

4.0 Conclusion

The concept of Nature Based Solutions recognizes the important role that ecosystems play in addressing societal challenges such as climate change, food and water security and natural disasters⁵⁹. It seeks to promote solutions that are effective and adaptable to the needs of both human beings and the environment⁶⁰. It adopts both an anthropocentric and eco-centric approaches in mitigating global challenges⁶¹. There is thus a need to embrace Nature Based Solutions in Kenya towards the attainment of Sustainable Development.

⁵⁸ Ibid

⁵⁹ Cohen-Shacham et al., 'Nature-Based Solutions to address Global Societal Challenges' Op Cit

⁶⁰ Seddon. N, et al. "Understanding the value and limits of nature-based solutions to climate change and other global challenges." Op Cit

⁶¹ Ibid

References

African Union, *African Convention on the Conservation of Nature and Natural Resources*, OAU, 1001 UNTS 3.

Apraku. A, John. M & Apraku. G "Climate change and small-scale agriculture in Africa: Does indigenous knowledge matter? Insights from Kenya and South Africa." *Scientific African* 12 (2021)

Climate Change Act, No. 11 of 2016

Cohen-Shacham et al., 'Nature-Based Solutions to address Global Societal Challenges' available at <https://portals.iucn.org/library/node/46191>

Constitution of Kenya, 2010

Convention on Biological Diversity (1992), 1760 UNTS 79

Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, 2.2. 1971)

Cousins. J., 'Justice in Nature-Based Solutions: Research and Pathways' *Ecological Economics* (2021) 180

Fitzmaurice, M., 'The Principle of Sustainable Development in International Development Law' *International Sustainable Development Law*, Vol. 1

Hartig. T et al., 'Nature and Health.' *Annual Review of Public Health* (2014) 35: 207–28.

Hickey. G et al., 'Challenges and Opportunities for Enhancing Food Security in Kenya' *Food Sec.* (2012) 4:333–340

International Union for Conservation of Nature, 'Nature-Based Solutions' available at <https://www.iucn.org/our-work/nature-based-solutions>

IUCN, 'Ensuring Effective Nature Based Solutions' available at <https://www.iucn.org/resources/issues-brief/ensuring-effective-nature-based-solutions>

Miles. L et al., 'Nature-Based Solutions for Climate Change Mitigation' available at <https://www.unep.org/resources/report/nature-based-solutions-climate-change-mitigation>

Muigua. K., 'Nurturing Our Environment for Sustainable Development' Glenwood Publishers Limited, 2016

Muigua.K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya' Glenwood Publishers Limited, 2015

Muna. M & Mugendi. D., 'Increasing Productivity through Maize-Legume Intercropping in Central Kenya' available at

https://www.researchgate.net/publication/262679891_Increasing_Productivity_Through_Maize-Legume_Intercropping_in_Central_Kenya

Naeem. S et al., 'Get the Science Right When Paying for Nature's Services.' *Science* 347(6227): 1206–1207.

Paris Agreement, United Nations, 2015

Rio Declaration on Environment and Development, A/CONF.151/26 (Vol. I)

Scott. M et al., 'Nature-based solutions for the contemporary city/Re-naturing the city/Reflections on urban landscapes, ecosystems services and nature-based solutions in cities/Multifunctional green infrastructure and climate change adaptation: brownfield greening as an adaptation strategy for vulnerable communities?/Delivering green infrastructure through planning: insights from practice in Fingal, Ireland/Planning for biophilic cities: from theory to practice, (2016) *Planning Theory & Practice*, 17:2, 267-300

Seddon. N, et al. "Understanding the value and limits of nature-based solutions to climate change and other global challenges." *Philosophical Transactions of the Royal Society B* 375.1794 (2020)

UK Pact., 'Nature-Positive Actions: Lessons from Forests' available at https://apps.worldagroforestry.org/downloads/Publications/PDFS/nature_positive_actions.pdf

UNDP, Sustainable Development Goals- Goal 3, Good Health and Well-Being, available at <https://www.undp.org/sustainable-development-goals#good-health>

UNDP, Sustainable Development Goals, Goal 6- Clean Water and Sanitation, available at <https://www.undp.org/sustainable-development-goals#clean-water-and-sanitation>

UNEP., Water Based Solutions for Water Management, available at <https://wedocs.unep.org/handle/20.500.11822/32058>

United Nations Environment Programme., 'Nature-Base Solutions for Climate Change Mitigation' available at <https://www.unep.org/resources/report/nature-based-solutions-climate-change-mitigation>

United Nations Framework Convention on Climate Change, United Nations, 1992

United Nations General Assembly, *Transforming our World: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1

United Nations, Department of Economic and Social Affairs, 'Sustainable Development' available at <https://sdgs.un.org/goals>

United Nations, Sustainable Development Goals, available at <https://sdgs.un.org/goals/goal13>

United Nations, Sustainable Development Goals, available at <https://www.undp.org/sustainable-development-goals#zero-hunger>

World Commission on Environment and Development, *Our Common future*. Oxford, (Oxford University Press, 1987).