

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

Kariuki Muigua

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

Kariuki Muigua*

Abstract

As the world focuses on achieving the Sustainable Development Goals (SDGs) by the year 2030, attention must also be paid to the important role that biodiversity will play if the dream of SDGs is to be realised. Biodiversity conservation will not only help in keeping the ecosystem services replenished for the sake of satisfying the human needs but also in protecting the health of the nature for the sake of future generations. This paper critically discusses the connection between biodiversity conservation and realisation of SDGs, which focus on challenges ranging from clean energy access, to poverty reduction and responsible consumption. The author argues that these SDGs cannot be met in and by an environment struggling with biodiversity loss and degradation.

1. Introduction

Arguably, biodiversity and ecosystems feature prominently across many of the Sustainable Development Goals (SDGs) and associated targets as they contribute directly to human well-being and development priorities.¹ It has been argued that there is a need for making biodiversity an integral part of economic and development strategy as it has the potential to bring a return on investment in economic, social and environmental terms.² This is important considering that the sustainable development agenda seeks to strike a working balance between development plans of a country an environmental conservation.³ This is because humans rely on the environment for ecosystem services which include regulating services (e.g., filtering pollution, coastal protection,

**PhD in Law (Nrb), FCI Arb (Chartered Arbitrator), LL. B (Hons) Nrb, LL.M (Environmental Law) Nrb; Dip. In Law (KSL); FCPS (K); Dip. In Arbitration (UK); MKIM; Mediator; Consultant: Lead expert EIA/EA NEMA; BSI ISO/IEC 27001:2005 ISMS Lead Auditor/ Implementer; Advocate of the High Court of Kenya; Senior Lecturer at the University of Nairobi, School of Law [November 2021].*

¹ United Nations Environment Programme, 'Biodiversity and the Sustainable Development Goals,' *CBD Press Brief*, Secretariat of the Convention on Biological Diversity < www.cbd.int/development/doc/biodiversity-2030-agenda-policy-brief-en.pdf> 31 July 2021.

² Limited BPPC, 'Biodiversity Dividend' *Bangkok Post* <<https://www.bangkokpost.com/business/2165927/biodiversity-dividend>> accessed 26 August 2021.

³ See Basiago AD, 'Economic, Social, and Environmental Sustainability in Development Theory and Urban Planning Practice' (1998) 19 *Environment Systems and Decisions* 145; Stephen Polasky, Catherine L. Kling, Simon A. Levin, Stephen R. Carpenter, Gretchen C. Daily, Paul R. Ehrlich, Geoffrey M. Heal, Jane Lubchenco, 'Role of Economics in Analyzing the Environment and Sustainable Development' (2019) 116 *Proceedings of the National Academy of Sciences* 5233.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

pest regulation, pollination), material provisioning services (e.g., food, energy, materials), and nonmaterial services (e.g., aesthetics, experience, learning, physical and mental health, recreation).⁴

The World Health Organization observes that since healthy communities rely on well-functioning ecosystems for clean air, fresh water, medicines and food security as well as limiting disease and stabilizing the climate, biodiversity loss can have adverse effects on human life and health by causing loss of livelihoods, income, local migration and, on occasion, may even cause or exacerbate political conflict, and limited discovery of potential treatments for many diseases and health problems, all critical elements of SDGs.⁵

The political leaders participating in the United Nations Summit on Biodiversity in September 2020, in their Pledge for Nature, themed *United to Reverse Biodiversity Loss by 2030 for Sustainable Development*, acknowledged the interdependent crises of biodiversity loss and ecosystem degradation and climate change - driven in large part by unsustainable production and consumption - requiring urgent and immediate global action since biodiversity loss, land and ocean degradation, pollution, resource depletion and climate change are accelerating at an unprecedented rate causing irreversible harm to our life support systems and aggravating poverty and inequalities as well as hunger and malnutrition.⁶

This paper generally discusses the role of biodiversity in the quest for achieving sustainable development agenda. Considering that biodiversity is a term used to refer to the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part, it is arguably important to conserve the same since most, if not all, of the socio-economic needs required to fulfil the SDGs directly rely on healthy ecosystems.

⁴ Stephen Polasky, Catherine L. Kling, Simon A. Levin, Stephen R. Carpenter, Gretchen C. Daily, Paul R. Ehrlich, Geoffrey M. Heal, Jane Lubchenco, 'Role of Economics in Analyzing the Environment and Sustainable Development' (2019) 116 Proceedings of the National Academy of Sciences 5233.

⁵ 'Biodiversity and Health' <<https://www.who.int/news-room/fact-sheets/detail/biodiversity-and-health>> accessed 25 November 2021.

⁶ Hub ISK, 'Leaders' Pledge for Nature Commits to Reverse Biodiversity Loss by 2030 | News | SDG Knowledge Hub | IISD' <<https://sdg.iisd.org/443/news/leaders-pledge-for-nature-commits-to-reverse-biodiversity-loss-by-2030/>> accessed 25 November 2021.

2. Linking Biodiversity Conservation and Sustainable Development Goals

Notably, the unusual rates of biodiversity loss, coupled with rising human population and consumption rates, threaten the sustainability of Earth's life support systems.⁷ It has been observed that rapid environmental change has resulted in reshaping ecosystems and increased species loss globally.⁸ Sustainable development goals (SDGs) set the 2030 agenda to transform the world by tackling multiple challenges humankind is facing to ensure well-being, economic prosperity, and environmental protection, thus providing a holistic and multidimensional view on development.⁹

Biodiversity and ecosystems feature prominently across many of the Sustainable Development Goals (SDGs) and associated targets.¹⁰ They contribute directly to human well-being and development priorities, where biodiversity is at the centre of many economic activities, particularly those related to crop and livestock agriculture, forestry, and fisheries and globally, nearly half of the human population is directly dependent on natural resources for its livelihood, and many of the most vulnerable people depend directly on biodiversity to fulfil their daily subsistence needs.¹¹

Regarding SDG 1 on ending poverty in all its forms everywhere, biodiversity provides resources and income, particularly for the rural poor. Ecosystem services and other non-marketed goods make up between 50% and 90% of the total source of livelihoods among poor rural and forest-dwelling households.¹²

The *2030 Agenda for Sustainable Development*, under Goal 2, aims to end hunger, achieve food security and improved nutrition and promote sustainable agriculture:- *By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including*

⁷ Cavender-Bares, J., Heffernan, J., King, E., Polasky, S., Balvanera, P. and Clark, W.C., 'Sustainability and Biodiversity' in Simon A Levin (ed), *Encyclopedia of Biodiversity (Second Edition)* (Academic Press 2013) <<https://www.sciencedirect.com/science/article/pii/B9780123847195003907>> accessed 12 September 2021.

⁸ Smith, M.M., Gilbert, J.H., Olson, E.R., Scribner, K.T., Van Deelen, T.R., Van Stappen, J.F., Williams, B.W., Woodford, J.E. and Pauli, J.N., 'A Recovery Network Leads to the Natural Recolonization of an Archipelago and a Potential Trailing Edge Refuge' n/a *Ecological Applications* e02416.

⁹ Pradhan, P., Costa, L., Rybski, D., Lucht, W. and Kropp, J.P., 'A Systematic Study of Sustainable Development Goal (SDG) Interactions' (2017) *5 Earth's Future* 1169.

¹⁰ Schultz, M., Tyrrell, T.D. and Ebenhard, T., "The 2030 Agenda and Ecosystems-A discussion paper on the links between the Aichi Biodiversity Targets and the Sustainable Development Goals." *SwedBio at Stockholm Resilience Centre, Stockholm, Sweden* (2016).

¹¹ Secretariat of the Convention on Biological Diversity, *Biodiversity and the 2030 Agenda for Sustainable Development*, available at: www.cbd.int/development/doc/biodiversity-2030-agenda-policy-brief-en.pdf accessed 12 September 2021.

¹² Ibid.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

infants, to safe, nutritious and sufficient food all year round; By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment; By 2030, ensure sustainable food production systems and implement 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 quality; By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed; increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.

The *CBD Aichi Target 13* states that countries should ensure: by 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

One of the aims of the Programme of Work on Agricultural Biological Diversity is to promote the fair and equitable sharing of benefits arising out of the use of genetic resources.¹³ Whilst the CBD refers to the concept of benefit sharing in the context of the use of genetic resources¹⁴ a number of CBD decisions make reference to benefit sharing that is not confined to genetic resources¹⁵ , including CBD Decision VII/11 which refers to "the equitable sharing of benefits derived from the

¹³ CBD Decision III/11, para. 1.

¹⁴ CBD Arts. 1 and 15.

¹⁵ Schroeder, Doris, "Benefit sharing: it's time for a definition," *Journal of medical ethics*, Vol. 33, no. 4 (2007), pp. 205-209, p. 205.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

use of *biodiversity*"¹⁶ (emphasis added). The concept of benefit sharing is linked to traditional knowledge.¹⁷

CBD Decision XIII/15 called for Parties to develop and implement incentives for farmers and indigenous peoples and local communities to protect pollinators and pollinator habitats, for example through benefit-sharing schemes, including payments for pollinator services schemes.¹⁸

As regards relevant international instruments, the *International Treaty on Plant Genetic Resources for Food and Agriculture*, (ITPGRFA) states that the Contracting Parties should take measures to protect and promote farmers' rights, including the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture.¹⁹

The *Voluntary Principles* provide that responsible investment in agriculture and food systems respects traditional knowledge by, among other things, promoting fair and equitable sharing of benefits arising from the utilization of genetic resources for food and agriculture and that this should be done within applicable systems of access to genetic resources for food and agriculture, while respecting the rights of indigenous peoples and local communities under national law.²⁰

In order to achieve SDG 3 on ensuring healthy lives and promoting well-being for all at all ages, healthy ecosystems help mitigate the spread and impact of pollution by both sequestering and eliminating certain types of air, water and soil pollution.²¹

SDG 5 requires countries to achieve gender equality and empower all women and girls. The targets therein are, *inter alia*: ensuring women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life; undertaking reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws; and adopting and strengthen sound policies and enforceable

¹⁶ CBD Decision VII/11, Annex I, annotations to rationale to Principle 10.

¹⁷ The CBD calls for the parties to encourage the equitable sharing of the benefits arising from the utilisation of the knowledge, innovations and practices of indigenous and local communities (CBD, Article 8(j)).

¹⁸ CBD Decisión XIII/15, para. 7(q).

¹⁹ ITPGRFA, Article 9.2(b).

²⁰ Principles for Responsible Investment in Agriculture and Food Systems provides, Principle 7, para. 27.

²¹ Lajaunie C and Morand S, 'Biodiversity Targets, SDGs and Health: A New Turn after the Coronavirus Pandemic?' (2021) 13 Sustainability 4353.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.²²

The CBD, in its preamble, recognizes “the vital role that women play in the conservation and sustainable use of biological diversity and affirms the need for the full participation of women at all levels of policy-making and implementation for biological diversity conservation.”²³

Healthy ecosystems can go a long way in achieving SDG 6 which seeks to ensure the availability and sustainable management of water and sanitation for all.²⁴

Biodiversity and ecosystems underpin many national and global economic activities, including those related to agriculture, forestry, fisheries and aquaculture, energy, tourism, transport and trade, and as such, biodiversity conservation and sustainable use can lead to higher productivity, more efficient resource use, and long-term viability of resources thus helping in achievement of SDG 8 which seeks to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.²⁵

More importantly, SDG 15 is dedicated to “*protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*”.²⁶

Being the supreme law of the land, the Constitution of Kenya sets a favourable environment for legislative protection of biodiversity. This is seen in Chapter Five on Land and the Environment, where there is the emphasis on sustainable use of land and other natural resources, including biodiversity as a key principle.²⁷ There is also the establishment of the National Land Commission, mandated to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities.

²² ‘Sustainable Development Goal 5: Gender Equality’ (*UN Women*) <<https://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-5-gender-equality>> accessed 15 September 2021.

²³ UN Women, “Towards a gender-responsive post-2020 global biodiversity framework: Imperatives and Key Components”, *A submission by the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women) as an input to the development of the post-2020 global biodiversity framework, 1 May 2019.*

²⁴ Environment UN, ‘GOAL 6: Clean Water and Sanitation’ (*UNEP - UN Environment Programme, 2 June 2021*) <<http://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-6>> accessed 13 September 2021.

²⁵ Secretariat of the Convention on Biological Diversity, Biodiversity and the 2030 Agenda for Sustainable Development, available at: www.cbd.int/development/doc/biodiversity-2030-agenda-policy-brief-en.pdf accessed 12 September 2021.

²⁶ ‘Biodiversity and Ecosystems: Sustainable Development Knowledge Platform’ <<https://sustainabledevelopment.un.org/topics/biodiversityandecosystems>> accessed 13 September 2021.

²⁷ The Constitution of Kenya 2010, Article 60, 69.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

Article 69 of the Constitution remains relevant in the quest for biodiversity conservation especially in relation to the obligations of the State in respect of the environment and natural resources management. It is comprehensive, addressing a number of cross-sectoral biodiversity concerns outlined by the CBD including issues of benefit sharing, traditional knowledge, elimination of activities harmful to biodiversity and the role of the community in conservation and sustainable use of biodiversity. Article 69(1) provides that: - *the State shall— (a) ensure sustainable exploitation, utilisation, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits; (c) protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities; (h) utilise the environment and natural resources for the benefit of the people of Kenya.*

Mainstreaming of biodiversity into different economic activities is considered necessary to both halt biodiversity loss and achieve the SDGs.²⁸ The highly interconnected SDGs will only be achieved in their entirety through transformative changes in our societies.²⁹

The Constitution also designates sustainable development as a national principle which is binding on all State organs, State officers, public officers and all persons.³⁰ In addition, it places an obligation upon the State to recognize the role of science and indigenous technologies in the development of the nation³¹. It goes further to mandate Parliament to enact legislation to ensure that communities receive compensation or royalties for the use of their cultures and cultural heritage; and legislation to recognise and protect the ownership of indigenous seeds and plant varieties, their genetic and diverse characteristics and their use by the communities of Kenya.

Notably, the political leaders participating in the United Nations Summit on Biodiversity in September 2020, representing 93 countries from all regions, and the European Union, committed to reversing biodiversity loss by 2030, same year SDGs are to be achieved.³² As part of the UN Decade of Action to achieve sustainable development, the leaders at the Summit committed to

²⁸ Hub ISK, 'Policy Brief: Why Biodiversity Matters: Mapping the Linkages between Biodiversity and the SDGs | SDG Knowledge Hub | IISD' <<https://sdg.iisd.org:443/commentary/policy-briefs/why-biodiversity-matters-mapping-the-linkages-between-biodiversity-and-the-sdgs/>> accessed 13 September 2021.

²⁹ Obrecht A and others, 'Achieving the SDGs with Biodiversity' (2021) 16 11.

³⁰ The Constitution of Kenya 2010, Article 10 (2) (d).

³¹ Ibid, Article 11 (2) (b).

³² 'Leaders' Pledge for Nature' (*Leaders Pledge for Nature*) <<https://www.leaderspledgefornature.org/>> accessed 25 November 2021.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

achieve the vision of Living in Harmony with Nature by 2050 by undertaking, *inter alia*: mainstreaming biodiversity into relevant sectoral and cross-sectoral policies at all levels, including in food production, agriculture, fisheries and forestry, energy, tourism, infrastructure and extractive industries, and trade and supply chains, as well as into key international agreements and processes.³³

In addition, in the 26th Conference of the Parties (or COP) to the UN Framework Convention on Climate Change (COP 26) Declaration on Forests and Land Use, the world leaders emphasised the critical and interdependent roles of forests of all types, biodiversity and sustainable land use in enabling the world to meet its sustainable development goals; to help achieve a balance between anthropogenic greenhouse gas emissions and removal by sinks; to adapt to climate change; and to maintain other ecosystem services.³⁴ Notably, the COP26 presidency, held by the U.K., themed the summit around a “Nature Campaign” that advocates for ecosystem and biodiversity conservation serving as the foundation for transforming food and agriculture systems to become more sustainable.³⁵

A World Wide Fund for Nature (WWF) 2021 Report titled *NDCs - A Force for Nature?*, and which was presented at COP 26 found that countries have started embracing nature based solutions in climate adaptation responses through their Nationally Determined Contributions (NDCs), country climate pledges under the Paris Agreement, where there was an increase from 82% to 92% of NDCs that included nature: 105 out of 114 (92%) of enhanced NDCs include nature-based solutions (NbS): 96 in the context of mitigation measures, 91 in the context of adaptation plans, with an overlap of 82 in both mitigation and adaptation.³⁶ For instance, *Kenya's Updated Nationally Determined Contribution (NDC) and JCM Activities*, submitted on 28th December, 2020, captures mitigation measures which include: making progress towards achieving a tree cover of at least 10% of the land area of Kenya; making efforts towards achieving land degradation neutrality; scaling up Nature Based Solutions (NBS) for mitigation; and enhancement of REDD+

³³ Ibid.

³⁴ ‘Glasgow Leaders’ Declaration on Forests and Land Use’ (UN Climate Change Conference (COP26) at the SEC – Glasgow 2021, 2 November 2021) <<https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>> accessed 25 November 2021.

³⁵ ‘Nature-Based Solutions at Center of COP26 Discussions’ (*Landscape News*, 10 November 2021) <<https://news.globallandscapesforum.org/55761/nature-has-its-moment-at-the-center-of-cop26-discussions/>> accessed 25 November 2021.

³⁶ ‘More Countries Including Nature in Their Climate Action Plans, but Step Change Still Needed To’ <https://wwf.panda.org/wwf_news/?4248391/NDCsreport> accessed 25 November 2021.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

activities, among others.³⁷ Nature-based Solutions are defined as ‘actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits’.³⁸

3. Conclusion

At the United Nations Summit on Biodiversity 2020, the political leaders acknowledged that our societies are intimately linked with and depend on biodiversity and its loss and the degradation of its contributions to people jeopardize progress towards the Sustainable Development Goals (SDGs) and human wellbeing.³⁹

Arguably, successful efforts to meet the needs of current and future generations will require a global perspective that considers the complex relationships between biodiversity, poverty, and equity as well as a progressive perspective that considers the nonlinear dynamics and potential tipping points in human and Earth systems.⁴⁰ It has been observed that the broader role of biodiversity and ecosystem function and the need to address drivers and pressures in order to maintain the flow of ecosystem services includes raising awareness of the values of biodiversity, effectively addressing perverse incentives, pollution, the concept of safe ecological limits within sustainable use, and the breadth of roles of traditional knowledge, culture and practices.⁴¹

Biodiversity has been identified as essential for sustainable development and human well-being as it underpins the provision of food and water; it mitigates and provides resilience to climate change; it supports human health, and provides jobs in agriculture, fisheries, forestry and many other sectors. Without effective measures to conserve biodiversity and use its components in a sustainable manner, the 2030 Agenda for Sustainable Development will not be achievable.

³⁷ Republic of Kenya, *Kenya's Updated Nationally Determined Contribution (NDC) and JCM Activities*, 28th December, 2020.

³⁸ ‘COP26: SDG or NDC? Our Guide to the Language You Need to Know’ (*UN News*, 26 October 2021) <<https://news.un.org/en/story/2021/10/1104022>> accessed 25 November 2021.

³⁹ ‘United Nations Summit on Biodiversity --30 September 2020’ (*Convention on Biological Diversity*) <<https://www.cbd.int/article/2020-UN-Biodiversity-Summit>> accessed 25 November 2021.

⁴⁰ Cavender-Bares, J., Heffernan, J., King, E., Polasky, S., Balvanera, P. and Clark, W.C., ‘Sustainability and Biodiversity’ in Simon A Levin (ed), *Encyclopedia of Biodiversity (Second Edition)* (Academic Press 2013) <<https://www.sciencedirect.com/science/article/pii/B9780123847195003907>> accessed 12 September 2021.

⁴¹ Schultz, M., Tyrrell, T.D. and Ebenhard, T., "The 2030 Agenda and Ecosystems-A discussion paper on the links between the Aichi Biodiversity Targets and the Sustainable Development Goals." *SwedBio at Stockholm Resilience Centre, Stockholm, Sweden* (2016), 4.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

References

- ‘Biodiversity and Ecosystems.: Sustainable Development Knowledge Platform’
<<https://sustainabledevelopment.un.org/topics/biodiversityandecosystems>> accessed 13 September 2021.
- ‘Biodiversity and Health’ <<https://www.who.int/news-room/fact-sheets/detail/biodiversity-and-health>>
accessed 25 November 2021.
- ‘COP26: SDG or NDC? Our Guide to the Language You Need to Know’ (*UN News*, 26 October 2021)
<<https://news.un.org/en/story/2021/10/1104022>> accessed 25 November 2021.
- ‘Glasgow Leaders’ Declaration on Forests and Land Use’ (UN Climate Change Conference (COP26) at the SEC – Glasgow 2021, 2 November 2021) <<https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>> accessed 25 November 2021.
- ‘Leaders’ Pledge for Nature’ (*Leaders Pledge for Nature*) <<https://www.leaderspledgefornature.org/>>
accessed 25 November 2021.
- ‘More Countries Including Nature in Their Climate Action Plans, but Step Change Still Needed to’
<https://wwf.panda.org/wwf_news/?4248391/NDCsreport> accessed 25 November 2021.
- ‘Nature-Based Solutions at Center of COP26 Discussions’ (*Landscape News*, 10 November 2021)
<<https://news.globallandscapesforum.org/55761/nature-has-its-moment-at-the-center-of-cop26-discussions/>> accessed 25 November 2021.
- ‘Sustainable Development Goal 5: Gender Equality’ (*UN Women*)
<<https://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-5-gender-equality>> accessed 15 September 2021.
- ‘United Nations Summit on Biodiversity --30 September 2020’ (*Convention on Biological Diversity*)
<<https://www.cbd.int/article/2020-UN-Biodiversity-Summit>> accessed 25 November 2021.
- Basiago AD, ‘Economic, Social, and Environmental Sustainability in Development Theory and Urban Planning Practice’ (1998) 19 *Environment Systems and Decisions* 145.
- Cavender-Bares, J., Heffernan, J., King, E., Polasky, S., Balvanera, P. and Clark, W.C., ‘Sustainability and Biodiversity’ in Simon A Levin (ed), *Encyclopedia of Biodiversity (Second Edition)* (Academic Press 2013) <<https://www.sciencedirect.com/science/article/pii/B9780123847195003907>> accessed 12 September 2021.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

Cavender-Bares, J., Heffernan, J., King, E., Polasky, S., Balvanera, P. and Clark, W.C., 'Sustainability and Biodiversity' in Simon A Levin (ed), *Encyclopedia of Biodiversity (Second Edition)* (Academic Press 2013) <<https://www.sciencedirect.com/science/article/pii/B9780123847195003907>> accessed 12 September 2021.

Environment UN, 'GOAL 6: Clean Water and Sanitation' (*UNEP - UN Environment Programme*, 2 June 2021) <<http://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-6>> accessed 13 September 2021.

Hub ISK, 'Leaders' Pledge for Nature Commits to Reverse Biodiversity Loss by 2030 | News | SDG Knowledge Hub | IISD' <<https://sdg.iisd.org:443/news/leaders-pledge-for-nature-commits-to-reverse-biodiversity-loss-by-2030/>> accessed 25 November 2021.

Lajaunie C and Morand S, 'Biodiversity Targets, SDGs and Health: A New Turn after the Coronavirus Pandemic?' (2021) 13 Sustainability 4353.

Limited BPPC, 'Biodiversity Dividend' *Bangkok Post* <<https://www.bangkokpost.com/business/2165927/biodiversity-dividend>> accessed 26 August 2021.

Obrecht, A., Pham, M., Spehn, E., Payne, D., Brémond, A.C., Altermatt, F., Fischer, M., Passarello, C., Moersberger, H., Schelske, O. and Guntern, J., 'Achieving the SDGs with Biodiversity' (2021) 16.

Pradhan, P., Costa, L., Rybski, D., Lucht, W. and Kropp, J.P., 'A Systematic Study of Sustainable Development Goal (SDG) Interactions' (2017) 5 Earth's Future 1169.

Republic of Kenya, Constitution of Kenya 2010.

Republic of Kenya, *Kenya's Updated Nationally Determined Contribution (NDC) and JCM Activities*, 28th December, 2020.

Schroeder, Doris, "Benefit sharing: it's time for a definition," *Journal of medical ethics*, Vol. 33, no. 4 (2007), pp. 205-209.

Schultz, M., Tyrrell, T.D. and Ebenhard, T., "The 2030 Agenda and Ecosystems—A discussion paper on the links between the Aichi Biodiversity Targets and the Sustainable Development Goals." *SwedBio at Stockholm Resilience Centre, Stockholm, Sweden* (2016).

Secretariat of the Convention on Biological Diversity, *Biodiversity and the 2030 Agenda for Sustainable Development*, available at: www.cbd.int/development/doc/biodiversity-2030-agenda-policy-brief-en.pdf accessed 12 September 2021.

Tracing the Role of Biodiversity Conservation in Achieving Sustainable Development Goals

Smith, M.M., Gilbert, J.H., Olson, E.R., Scribner, K.T., Van Deelen, T.R., Van Stappen, J.F., Williams, B.W., Woodford, J.E. and Pauli, J.N., 'A Recovery Network Leads to the Natural Recolonization of an Archipelago and a Potential Trailing Edge Refuge' n/a Ecological Applications e02416.

Stephen Polasky, Catherine L. Kling, Simon A. Levin, Stephen R. Carpenter, Gretchen C. Daily, Paul R. Ehrlich, Geoffrey M. Heal, Jane Lubchenco, 'Role of Economics in Analyzing the Environment and Sustainable Development' (2019) 116 Proceedings of the National Academy of Sciences 5233.

UN Women, "Towards a gender-responsive post-2020 global biodiversity framework: Imperatives and Key Components", *A submission by the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women) as an input to the development of the post-2020 global biodiversity framework, 1 May 2019.*

United Nations Environment Programme, 'Biodiversity and the Sustainable Development Goals,' *CBD Press Brief*, Secretariat of the Convention on Biological Diversity <
www.cbd.int/development/doc/biodiversity-2030-agenda-policy-brief-en.pdf> 31 July 2021.