

**Combating Climate Change Through Sustainable Forests Management for
Current and Future Generations**

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Abstract

This paper critically discusses how taking care of forests can positively contribute to climate change mitigation as part of achieving sustainable development for a better tomorrow. Arguably, continued deterioration of forest areas and the ever growing threat of climate change is likely to affect human life, thus creating the need for combating both. The author argues that taking care of forests is not only important in climate change mitigation but also a key step towards conservation of the rich biodiversity to be found in forest areas and preserving source of livelihood for the people.

1. Introduction

It has rightly been pointed out that in particular, the rural poor, young people, and women, investing in forests and forestry is an investment in people and their means of subsistence. An estimated 1.6 billion people, including more than 2,000 indigenous groups, rely on forests for their survival. As the habitat for more than 80% of the terrestrial species of animals, plants, and insects, forests are the most biologically diverse ecosystems on land. In addition, they give communities that depend on the forest shelter, employment, and security.¹ The future supply of ecosystem services by forests, such as carbon storage, wood production, animal habitats, and hydrological cycle management, will be significantly impacted by how they adapt to climatic variability.² Due to climate change, there are more severe droughts happening more frequently in various parts of the world. Forest function and structure are changed by droughts.³

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¹ 'Forests | Department of Economic and Social Affairs' <<https://sdgs.un.org/topics/forests#publications>> accessed 15 March 2023.

² Zhang, T., Niinemets, Ü., Sheffield, J. and Lichstein, J.W., "Shifts in tree functional composition amplify the response of forest biomass to climate." *Nature* 556, no. 7699 (2018): 99-102, at p. 99.

³ Bennett, A.C., McDowell, N.G., Allen, C.D. and Anderson-Teixeira, K.J., 'Larger Trees Suffer Most during Drought in Forests Worldwide' (2015) 1 *Nature Plants* 15139 <<https://www.nature.com/articles/nplants2015139>> accessed 17 March 2023.

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

This paper critically discusses the relationship between climate change and forests and offers recommendations on how climate change mitigation can be promoted through enhanced sustainable forests management.

2. Climate Change and the Forests: The Link

Kenya's Climate Change Act 2016⁴ was enacted to provide for a regulatory framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes. The Act defines "climate change" to mean a change in the climate system which is caused by significant changes in the concentration of greenhouse gases as a consequence of human activities and which is in addition to natural climate change that has been observed during a considerable period.⁵

Being a major source of terrestrial biodiversity and a net sink for atmospheric carbon, forests play a crucial role in maintaining the health of global ecosystems. Many ecological services that trees offer, along with others, may be vulnerable to both short-term climatic fluctuation and climate change.⁶

The United Nations 2030 Agenda for Sustainable Development Goals under Goal 15 seeks 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'.⁷ Natural catastrophes, such as floods, droughts, landslides, and other catastrophic occurrences, are far less likely to occur when there are more forests. Forests help to maintain the air's balance of oxygen, carbon dioxide, and humidity on a global scale, as well as to safeguard watersheds that provide 75% of the world's freshwater. This is achieved through sequestering carbon from the atmosphere.⁸

⁴ Climate Change Act, No. 11 of 2016, Laws of Kenya.

⁵ Sec. 2, Climate Change Act, 2016.

⁶ Zhang, T., Niinemets, Ü., Sheffield, J. and Lichstein, J.W., "Shifts in tree functional composition amplify the response of forest biomass to climate." *Nature* 556, no. 7699 (2018): 99-102.

⁷ 'Goal 15: Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, and Halt and Reverse Land Degradation and Halt Biodiversity Loss — SDG Indicators' <<https://unstats.un.org/sdgs/report/2016/goal-15/>> accessed 6 March 2023.

⁸ 'Forests | Department of Economic and Social Affairs' <<https://sdgs.un.org/topics/forests#publications>> accessed 14 March 2023.

3. Combating Climate Change: Saving Our Forests for Today and Tomorrow

This section offers some viable recommendations that can greatly contribute to sustainable management of forests as a step towards climate change mitigation.

3.1. Enhancement of Public-Private Collaborations in Forests Conservation and Climate Change Mitigation

Notably, the Forest Conservation and Management Act 2016 provides that the Kenya Forest Service may, whenever circumstances make it necessary or appropriate to do so, invite the private sector to participate in the sustainable management of forests under their jurisdiction. For this, the Service may issue authorisations for forestry activities in form of—a permit; a timber licence; a special use licence; a contract; a joint management agreement; or a concession agreement.⁹ It is worth exploring these collaborations as a way of enhancing sustainable forest management and conservation, where public–private partnerships are here defined as: “collaborative arrangements in which actors from two or more spheres of society (state, market, and/or civil) are involved in a non-hierarchical process, and through which these actors strive for a sustainability goal”.¹⁰

It has been argued that these collaborations can enhance all the three aspects of sustainability, albeit at different levels. Outcomes of such collaborations can thus be divided broadly into three types: social, ecological and economic. This is in line with the understanding that the concept of sustainable development has evolved over the years:

- a. Social aspect: Respecting human rights and providing equal opportunity for everyone in society is a key component of sustainability. With an emphasis on reducing poverty, it necessitates an equal distribution of resources. There is a focus on local communities, including preserving and enhancing their life support systems, acknowledging and respecting other cultures, and averting all forms of exploitation. Hence, social outcomes comprise social capital, trust, increased equity, and raised living standards.¹¹

⁹ Sec. 56(1) (2), Forest Conservation and Management Act 2016.

¹⁰ Bjärstig T, ‘Does Collaboration Lead to Sustainability? A Study of Public–Private Partnerships in the Swedish Mountains’ (2017) 9 Sustainability 1685.

¹¹ Ibid, p. 3; Banik D, ‘Legal Empowerment as a Conceptual and Operational Tool in Poverty Eradication’ (2009) 1 Hague Journal on the Rule of Law 117.

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

b. "Ecological outcome" refers to the management and conservation of resources, particularly those that are finite or vital to maintaining life. Action must be taken to reduce pollution of the air, land, and water as well as to protect biological variety and the world's natural heritage. Natural resource conditions such as water quality, fish populations, biodiversity, improving green infrastructure, stopping soil erosion, etc. are examples of ecological outcomes.¹²

3. Economic success entails fostering wealth at all societal levels and addressing the cost-effectiveness of every economic activity. It is crucially about the capacity of businesses and activities to continue operating over the long term. Economic effects include the capacity of small businesses to compete locally, advancements in technology and efficiency, job prospects, and funding sources.¹³

The net effect of all these outcomes may be better living standards with alternative sources of income, which means reduced pressure on forests as well as more free land for reforestation. This will positively contribute to climate change mitigation through healthier forests as well as alleviation of poverty, which is key objective of Sustainable Development Goals. As has been correctly noted, it is crucial to recognise how intertwined the three sustainability dimensions are and how they may coexist peacefully or conflict. As such, achieving sustainable development requires finding a balance between these three sustainability aspects.¹⁴

3.2. Investments in Alternative Sources of Energy

Africa has a significant chance to fill the gap in the demand for renewable energy and it has been argued that falling clean technology costs offer new hope for the continent's future. In order to meet Africa's energy and climate targets, energy investment must more than double this decade along with a significant rise in adaptation. In the past two decades, Africa received just 2% of

¹² Bjärstig T, 'Does Collaboration Lead to Sustainability? A Study of Public–Private Partnerships in the Swedish Mountains' (2017) 9 Sustainability 1685, p. 3.

¹³ Ibid, p. 3; see also Shuman M, *The Local Economy Solution: How Innovative, Self-Financing "Pollinator" Enterprises Can Grow Jobs and Prosperity* (Chelsea Green Publishing 2015); 'Macroeconomic Policy and Poverty Reduction' <<https://www.imf.org/external/pubs/ft/exrp/macropol/eng/>> accessed 18 March 2023.

¹⁴ Bjärstig T, 'Does Collaboration Lead to Sustainability? A Study of Public–Private Partnerships in the Swedish Mountains' (2017) 9 Sustainability 1685, p. 3.

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

investments in sustainable energy. A \$25 billion yearly investment, or around 1% of current global energy investment, is needed to ensure that all Africans have access to modern energy.¹⁵

Food and Agriculture Organisation (FAO) rightly points out that before petroleum became widely accessible during the past 100 years, wood was historically the most significant source of energy for humans. Wood still serves as the primary source of energy for heating and cooking in many of the world's poorest nations.¹⁶ As previously said, forests offer a variety of functions, including the preservation of biodiversity and the mitigation of climate change, while also producing both timber and non-timber forest products.¹⁷

There is need for more investments alternative sources of renewable energy, away from forests, if significant progress is to be realised in restoration of forest areas especially in the rural areas of developing countries like Kenya. Investments in renewable energy sources and more efficient energy use, particularly in transportation and industrial operations, are primarily driven by climate change, rising fossil fuel prices, and the concern about the security of the energy supply.¹⁸

During the next eight years, the amount of power produced from sustainable energy sources must double in order to prevent a rise in global temperatures. According to a new multi-agency 2022 report¹⁹ from the World Meteorological Organization, if we don't act, there's a chance that climate change, more severe weather, and water stress may threaten our energy security and even threaten renewable energy sources.²⁰ According to WMO Secretary-General, Prof Petteri Taalas, Three-quarters of all greenhouse gas emissions worldwide are produced by the energy industry. If we are to survive in the twenty-first century, switching to renewable energy sources like solar, wind, and hydropower is essential. So is increasing energy efficiency. The objective is net zero by 2050. But

¹⁵ 'Climate Change Puts Energy Security at Risk' (10 October 2022) <<https://public.wmo.int/en/media/press-release/climate-change-puts-energy-security-risk>> accessed 18 March 2023.

¹⁶ Broadhead J and Killmann W, *Forests and Energy: Key Issues* (Food & Agriculture Org 2008) <<https://www.fao.org/forestry/13707-0e576ecd14f96f198d96c03149a6db0c0.pdf>> accessed 18 March 2023.

¹⁷ Gondo PC, 'Financing of Sustainable Forest Management in Africa: An Overview of the Current Situation and Experiences' [2010] Southern Alliance for indigenous resources (SAFIRE), p. 12 <https://www.un.org/esa/forests/wp-content/uploads/2014/12/Africa_case_study.pdf> accessed 18 March 2023.

¹⁸ Broadhead J and Killmann W, *Forests and Energy: Key Issues* (Food & Agriculture Org 2008), p.1.

¹⁹ Organization (WMO) WM and World Meteorological Organization (WMO), *2022 State of Climate Services: Energy (WMO-No. 1301)* (WMO 2022).

²⁰ 'Climate Change Puts Energy Security at Risk' (10 October 2022) <<https://public.wmo.int/en/media/press-release/climate-change-puts-energy-security-risk>> accessed 18 March 2023.

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

we will not get there until we double the amount of low-emission power available in the following eight years.²¹

Reduced deforestation and health hazards linked with the usage of firewood are two benefits of diversifying energy sources. The use of renewable energy may also help to achieve SDG Goal 4 on education since it spares women and children from having to spend time gathering firewood, time that might be better spent on other useful activities and education.²²

3.3. Enhanced Implementation of the National Tree Planting Week

Notably, the Constitution of Kenya 2010 outlines one of the environmental obligations of the State as working to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya.²³ It is perhaps out of this constitutional requirement that the Forest Conservation and Management Act 2016 provides that the Cabinet Secretary shall plan and execute programmes necessary for observing the national tree-planting week and the International Day of Forests.²⁴ The national tree-planting day in Kenya is observed in April or May. The activities are not bound to a certain day but are confined throughout the lengthy rains season in April -May.²⁵

It is imperative that the State, through the relevant departments takes up this duty seriously and also enhance free supply of the relevant seedlings as a way of encouraging the general public to not only participate but also make it their way of everyday life to plant trees in public places as well as their own private parcels of land. This will go a long way in realisation of Kenya's President's call for reforestation of the country.²⁶

²¹ 'Climate Change Puts Energy Security at Risk' (10 October 2022) <<https://public.wmo.int/en/media/press-release/climate-change-puts-energy-security-risk>> accessed 18 March 2023.

²² Organization (WMO) WM and World Meteorological Organization (WMO), *2022 State of Climate Services: Energy (WMO-No. 1301)* (WMO 2022), p.44.

²³ Article 69 (1) (b), Constitution of Kenya 2010.

²⁴ Sec. 55, Forest Conservation and Management Act 2016.

²⁵ Macharia DA, 'National Tree Planting Day' (*Mazingira Safi*, 8 May 2014) <<https://www.mazingirasafi.com/national-tree-planting-day/>> accessed 18 March 2023.

²⁶ 'President Uhuru Sets an Ambitious 30% Target for Forest Cover by 2050 during the Launch of Kenya's Tree Growing Fund and Campaign | United Nations Development Programme' (*UNDP*) <<https://www.undp.org/kenya/press-releases/president-uhuru-sets-ambitious-30-target-forest-cover-2050-during-launch-kenya%E2%80%99s-tree-growing-fund-and-campaign>> accessed 18 March 2023; GROUP NK-NM, 'NTV Kenya: President Ruto Launches Tree Restoration Program to Combat Climate Change' (*NTV Kenya*) <<https://ntvkenya.co.ke/climate-change/president-ruto-launches-tree-restoration-program-to-combat-climate-change/>> accessed 18 March 2023; 'Kenya to Plant 5 Billion Trees in 5 Years - Ruto' (20 October 2022) <<https://www.pd.co.ke/news/kenya-to-plant-5-billion-trees-in-5-years-ruto-154665/>> accessed 18 March 2023; 'Plant 300 Trees and Get Certificate, Kenyans Told' (21 October 2022) <<https://www.pd.co.ke/news/plant-300-trees-and-get-certificate-154782/>> accessed 18 March 2023; 'First Lady Rachel Ruto Embarks on Reforestation Crusade –

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

3.4. Tax and fiscal incentives

The Forest Conservation and Management Act 2016 empowers the Cabinet Secretary for the National Treasury, on the recommendation by the Cabinet Secretary, propose tax and other fiscal incentives to increase investments in forest land use and forest resource utilization in order to promote forest conservation and management, and to prevent or abate forest degradation.²⁷ The tax and fiscal incentives, may include—(a) customs and excise waiver in respect of imported capital goods or tax rebates to forest industries and other establishments investing in plants, equipment and machinery for improved resource utilization and for using other energy resources as substitutes for hydrocarbons; (b) exemption from payment of all or part of the land rates and such other charges as may be levied in respect of the land on which a private forest is established; and (c) income and other tax deductions to landowners in exchange for the establishment of a forest conservation easement.

These incentives can greatly contribute to sustainable forest management in Kenya, if efficiently implemented.

3.5. Tapping into Indigenous Knowledge

The Climate Change Act 2016 provides that ‘In formulating the National Climate Change Action Plan, the Cabinet Secretary shall be informed by, *inter alia*, indigenous knowledge related to climate change adaptation and mitigation’.²⁸ Similarly, the role of indigenous knowledge was recognised by the Court in the case of *Joseph Letuya & 21 others v Attorney General & 5 others [2014] eKLR*²⁹ where the Court stated as follows:

Quite apart from the special consideration that needs to be given to the Ogiek community as a minority and indigenous group when allocating forest land that this court has enunciated on in the foregoing, this court also recognizes the unique and central role of indigenous forest dwellers in the management of forests. This role is recognized by various international and national laws. The Convention on Biological Diversity which Kenya has ratified and which is now part of Kenyan law by virtue of Article 2(6) of the Constitution recognizes the importance of traditional knowledge, innovations and practices of indigenous and local communities for the conservation and sustainable

Kenya News Agency’ (17 November 2022) <<https://www.kenyanews.go.ke/first-lady-rachel-ruto-embarks-on-reforestation-crusade/>> accessed 18 March 2023.

²⁷ Sec. 54(1), Forest Conservation and Management Act 2016.

²⁸ Sec. 13(5)(g), climate Change Act 2016.

²⁹ *Joseph Letuya & 21 others v Attorney General & 5 others [2014] eKLR*, Elc Civil Suit 821 of 2012 (Os).

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

use of biodiversity and that such traditional knowledge should be respected, preserved and promoted. Article 8 (j) of the Convention places an obligation on State Parties in this respect to:

“Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.”

This court is also guided in this respect by several multilateral environmental agreements which now shape the strategies and approaches by governments in relation to the environment and development, including forest policy. These include the Rio Declaration on Environment and Development and Agenda 21 which are widely accepted sources of international customary environmental law. Principle 22 of the Rio Declaration on Environment and Development provides that indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States are encouraged to recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development. Chapter 26 of Agenda 21 is likewise dedicated to strengthening the role of indigenous communities in sustainable development.

The Forest Conservation and Management Act, 2016³⁰ also highlights this by providing that some of the principles of this Act shall be: public participation and community involvement in the management of forests; and protection of indigenous knowledge and intellectual property rights of forests resources.³¹

On the relationship between forests and climate change mitigation, the Forest Conservation and Management Act, 2016 provides that ‘all indigenous forests and woodlands shall be managed on a sustainable basis for purposes of, *inter alia*: conservation of water, soil and biodiversity; and carbon sequestration and other environmental services.³²

There is a need to tap into and incorporate this knowledge in enhancing sustainable forests management in the country.

3.6. Diversified Financing for Sustainable Forest Management

As per part III (sections 23-29) of the Forest Conservation and Management Act, 2016, majority of the forests conservation activities in Kenya are to be funded by the government of Kenya.

³⁰ Forest Conservation and Management Act, No. 34 of 2016, Laws of Kenya.

³¹ Sec. 4 (a) (e), Forest Conservation and Management Act 2016.

³² Sec. 42(1), Forest Conservation and Management Act 2016.

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

Naturally, this comes with its limitations due to inadequate resources and calls for diversification of funding mechanisms for these activities.

It has been argued that due to the numerous benefits and purposes of trees and forests, as well as the numerous stakeholders and actors who can and do influence forest management and management decisions, sustainable forest management should not be the exclusive domain of the government but rather of society at large. As a result, new strategies, institutional frameworks, and funding sources are required to make this a reality.³³ Aside from that, the new funding systems that are needed must take into consideration the financial requirements of various players as well as the various management objectives, taking into account the unique characteristics of various forest ecosystems and the socioeconomic circumstances of every nation.³⁴ By providing revenue, employment, food security, and shelter where it is most desperately needed, sustainable forest management may support economic growth. Sustainable forest management is all about finding a means to strike a balance between human requirements and concerns about the long-term viability of forest resources.³⁵

Commentators have also noted that the continent's current systems for financing forests are still insufficient to create the conditions needed to stop deforestation and forest degradation processes, encourage rehabilitation and afforestation/reforestation, and increase the areas of forest under sustainable management.³⁶ It has been suggested that in order to provide the institutional framework for effective forest governance and sustainable forest management and to foster the crucial local community engagement, partnerships between a number of actors are required. The rationale behind this is that by pooling the resources, expertise, knowledge, and political influence

³³ Gondo, P.C., 'Financing of Sustainable Forest Management in Africa: An Overview of the Current Situation and Experiences' 2010 <<https://www.semanticscholar.org/paper/FINANCING-OF-SUSTAINABLE-FOREST-MANAGEMENT-IN-AN-OF-Gondo/c63f5beca0178f60763046d3c0779ef6caf2a21f>> accessed 18 March 2023, p.61.

³⁴ Gondo, P.C., 'Financing of Sustainable Forest Management in Africa: An Overview of the Current Situation and Experiences' 2010, p. 61.

³⁵ United Nations Forum on Forests, 'Enabling Sustainable Forest Management: Strategies for equitable development, for forests, for people' <https://www.un.org/esa/forests/wp-content/uploads/2015/06/Enabling_SF_M_highlights.pdf> accessed 18 March 2023.

³⁶ Gondo, P.C., 'Financing of Sustainable Forest Management in Africa: An Overview of the Current Situation and Experiences' 2010, p. 61.

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

of players operating at various scales, the parties would be able to do more together than they could alone.³⁷

Enhanced coordination at the national level would include integrating tools like national forest finance policies and information sharing, which might be handled through suitable arrangements spearheaded by governments. Also, the government should develop the necessary capacities to fully use the increasingly complex and diverse external and internal financial mechanisms for forests.³⁸

4. Conclusion

It has rightly been pointed out that woodlands and forests contribute significantly to the global carbon cycle and, as a result, to the acceleration or slowing of global climate change.³⁹ This is because around 50% of the world's terrestrial organic carbon stores are found in forests, while 80% of all terrestrial biomass is found in forests. More over two thirds of the world's terrestrial net primary output comes from forests. So, slowing down forest loss and re-establishing forest cover in deforested regions might help lessen the effects of climate change.⁴⁰

For climate change to be mitigated, fossil fuel use must be reduced, and for that, global carbon emissions must peak by 2025 and reach net zero by 2050. Sadly, the speed of carbon emissions continues to be inconsistent with the objectives of the Paris agreement (IPCC, 2021).⁴¹

According to studies conducted in a few emerging nations, the security of agriculture, water, and energy is at systemic risk due to the effects of climatic unpredictability and change, expanding economies, and rising urbanization. For disadvantaged rural communities, agricultural output is a

³⁷ Ros-Tonen, M.A., Van Andel, T., Morsello, C., Otsuki, K., Rosendo, S. and Scholz, I., 'Forest-Related Partnerships in Brazilian Amazonia: There Is More to Sustainable Forest Management than Reduced Impact Logging' (2008) 256 *Forest Ecology and Management* 1482.

³⁸ Gondo, P.C., 'Financing of Sustainable Forest Management in Africa: An Overview of the Current Situation and Experiences' 2010, p. 61; see also Besacier, C., Garrett, L., Iweins, M. and Shames, S. 2021. Local financing mechanisms for forest and landscape restoration – A review of local level investment mechanisms. *Forestry Working Paper No. 21*. Rome, FAO. <https://doi.org/10.4060/cb3760en>; cf. Kamara Y, 'Existing and Potential Forest Financing Mechanisms for Smallholders and Community Forestry in West Africa' [2011] Initiatives Conseil International. Burkina Faso: Food and Agriculture Organization of the United Nations; Gomez-Echeverri L, 'National Climate Funds', *Handbook of International Climate Finance* (Edward Elgar Publishing 2022); 'Developing the International Financing Facility for Forests (IFFFor) | Profor' <<https://www.profor.info/knowledge/developing-international-financing-facility-forests-iffor>> accessed 18 March 2023.

³⁹ Shvidenko A and Gonzalez P, 'Chapter 21: Forest and Woodland Systems', p.587.

⁴⁰ Ibid.

⁴¹ Cevik S, 'Climate Change and Energy Security: The Dilemma or Opportunity of the Century?' 2022 IMF Working Paper, WP/22/174 < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4224062> accessed 18 March 2023.

Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

significant source of employment. From small-scale subsistence farming to large-scale export-oriented agriculture, water availability is essential for agricultural output. In addition, the capacity for producing electricity, the control of peak supply and demand, and the safety of dams are all seriously impacted by climate change and unpredictability (including both deficiencies and surpluses in rainfall).⁴² Arguably, forests not only contribute in climate change mitigation but also in some areas act as sources of rivers, which are evidently important for agriculture and generation of hydropower. This thus calls for concerted efforts towards forests conservation and restoration not only for climate change mitigation but also to secure the future of both current and future generations. This should be done alongside employment of measures that reduce pressure on these forests, as discussed in this paper.

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⁴² ‘Enhancing Adaptive Capacity of Andean Communities through Climate Services (ENANDES) (Chile, Colombia, Peru) - Adaptation Fund’ <<https://www.adaptation-fund.org/project/chile-colombia-peru-enhancing-adaptive-capacity-andean-communities-climate-services-enandes/>> accessed 18 March 2023.

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Combating Climate Change Through Sustainable Forests Management for Current and Future Generations

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