



Role of REDD+ in Reducing Land Degradation and Achieving SDGs

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Abstract

Land and its natural resources are essential for maintaining biodiversity and related ecological processes. Unfortunately, lands are degrading due to natural and anthropogenic factors, which may eventually lead to desertification. Deforestation significantly emits greenhouse gases that devastatingly lead to global warming and climate change. It necessitates a sustainable solution that promotes reforestation combined with emission reductions. Hence, reducing emissions from forest degradation and deforestation (REDD+) arose as an international policy tool to address the forest sector emissions and sustainable management of forests and their ecosystem services. REDD+ projects promise “triple-win” benefits that include mitigating climate change, conserving biodiversity, and uplifting local communities. In addition, REDD+ potentially contributes toward sustainable development goals (SDGs); and there is a mutual relationship between SDGs and REDD+ that integrate sustainability, management, and conservation. The principal SDGs fulfilled by REDD+ is SDG 13 (climate action) and SDG 15 (life on land). REDD+ opens up a new framework and path for forest management through policy-level changes, multi-stakeholder participation, and carbon credit trades. So, this book chapter discusses and reviews various aspects of REDD+ in reducing land degradation and contributing toward SDGs.

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16.1 Introduction

The land sustains diverse organisms and societies worldwide. It comprises natural resources (soil, near-surface air, vegetation, other biotas, and water); ecological processes; topography; and human settlements (Abdulmalik and Zewide 2021; Henry et al. 2018). The land is fundamental for enhancing biodiversity and inherently essential for various activities: forestry, agriculture, water source maintenance, and grazing. Forests, unequally distributed in 31% of the global land area, are home to diverse organisms and sequester enormous carbon (FAO and UNEP 2020). Even though they secure livelihood and mitigate climate change, deforestation and forest degradation continue alarmingly. According to the state of world forest report of FAO and UNEP (2020), the rate of deforestation during 2015–2020 is ten million hectares per year. Simultaneously, land degradation is also of considerable concern at the regional, national, and global levels, since it significantly reduces the capacity of the soil for production. The land degradation process accounts for the changes in topography, climate, vegetation cover, and water rather than soil alone (Mohamed et al. 2019). These changes further impact the biodiversity status of the land and make the environment vulnerable to more threats (Mohamed et al. 2019; Stockings and Murnaghan 2000). In the last 40 years, the world witnessed 33% of arable land loss combined with soil erosion or pollution (Boer and Hannam 2019). In addition to land degradation, desertification and drought also impact land wealth. The main reasons for land desertification include unsustainable farming, deforestation, overgrazing, and mining. Figure 16.1 shows natural and anthropogenic (human-induced) drivers of land degradation with its effects.

Deforestation and forest degradation are responsible for about 25% of global GHG (Green House Gas) emissions (Chand et al. 2021; Pendrill et al. 2019). Several international initiatives emerged during the last few decades to combat the devastating effects of land degradation and deforestation. Some of them that aim for a sustainable future are UNCCD (United Nations Convention to Combat Desertification) and REDD+ (reducing emissions from forest degradation and deforestation). UNCCD is a legally binding agreement that links sustainable land management with both environment and development. The primary objective of UNCCD is to reduce land degradation. Concomitantly, REDD+ restores the land through proper planning and implementation of activities. REDD+ implemented reforestation and afforestation programs on about 162 million hectares of land so far (UNEP 2022). Hence, UNCCD and The Paris Climate Agreement strongly admit the potential of REDD+ in achieving land degradation neutrality and sustainability (Kumar et al. 2021). The book chapter highlights the vital role of REDD+ in reducing land degradation and reveals the REDD+ as a strategy that contributes to sustainable development goals.

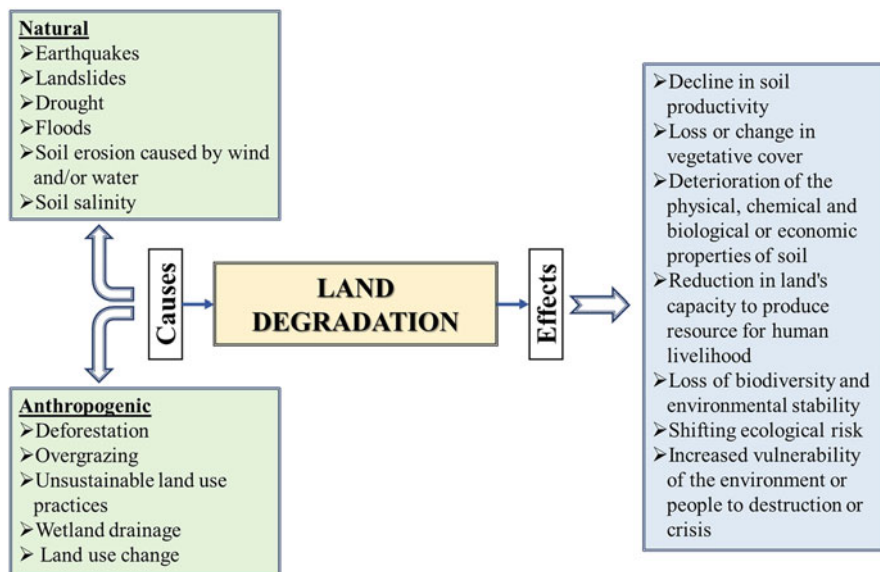


Fig. 16.1 Causes and effects of land degradation. (Source Abdulmalik and Zewide 2021; Boer and Hannam 2019; Kumar et al. 2021; Vinya et al. 2011)

16.2 REDD+

REDD+, created by UNFCC, is a global policy tool that addresses forestry sector emissions (Chand et al. 2021). REDD+ enhances the sustainable management of natural forests and their ecosystem services; additionally, it conserves forest carbon stocks by ensuring the participation of various stakeholders. REDD+ focuses on global action plans and sustainable solutions; moreover, it motivates developing countries to mitigate climate change by preventing deforestation and GHG emission (Kumar et al. 2021). REDD+ projects promise “triple-win” benefits that include mitigating climate change, conserving biodiversity, and uplifting local communities (Milbank et al. 2018).

The concept emerged during COP (Conference of Parties) 11 of UNFCC in 2005 as RED (reducing emission from deforestation); and further broadened as REDD (reducing emissions from deforestation and forest degradation) during COP13 in Bali, Indonesia, in 2007. At COP 14 in 2008, the initiative fully evolved with worldwide acceptance to the current form as REDD+ that included additional concepts of conserving and enhancing forest carbon stocks, managing forests sustainably, improving rural livelihood, and conserving biodiversity (Chacón-Cascante et al. 2011; Chand et al. 2021; Wright 2011). Hence, the REDD+ temporally extends its scope with policies and actions. Currently, REDD+ opens up a new pathway for sustainable forest management through a nested governance structure regionally,

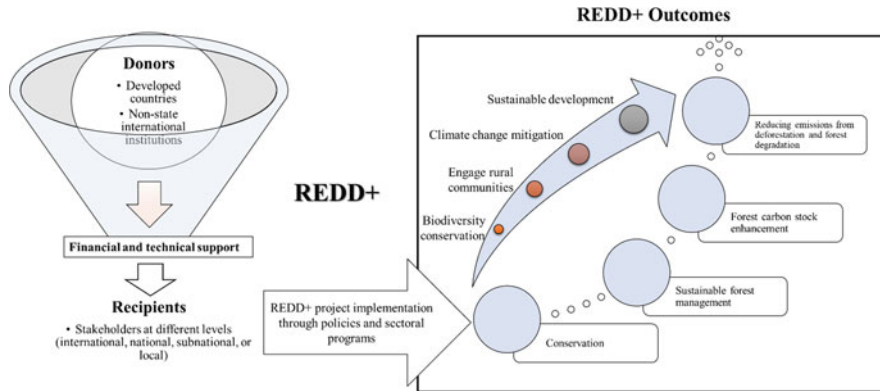


Fig. 16.2 Structure and beneficial outcomes of REDD+. (Figure modified from Shin et al. 2022)

nationally, and internationally; by integrating carbon markets and other innovative ideas (Chacón-Cascante et al. 2011).

In REDD+, donors, consisting of developed nations or international institutes, provide technical and financial support to recipients. This partnership with multiple actors under the global forest and climate change regime is the heart of every REDD + project. Figure 16.2 represents the structure of REDD+ and its beneficial outcomes. REDD+ implementation requires specific actions to improve the project's efficiency, delivery, accountability, and effectiveness that can achieve only with multilevel governance with different stakeholders (Angelsen and McNeill 2012; Shin et al. 2022). Furthermore, the collaboration equips the developing nations in capacity building. Hence, the success and outcomes of every REDD+ project primarily depend on the partnership. Shin et al. (2022) analyzed the REDD+ architecture using data from 480 REDD+ projects implemented in 57 countries and showed the polycentric networks and partnerships across various organizations and research institutes.

Developed nations provide monetary compensation and financial resource to countries, communities, or individuals who reduce carbon emissions from deforestation and forest degradation through REDD+ (Angelsen 2008; Chacón-Cascante et al. 2011; Wright 2011). In other words, “developed nations pay developing nations to keep their forests standing and well-managed” (Wright 2011). In that way, REDD+ ensures the economic upliftment of developing countries, both by offsetting emissions and by selling the carbon stored in forests in international carbon markets. Thus, technically, the REDD+ mechanism provides a new scale to forest governance with a unique motive and complexity (Wright 2011).

REDD+ activities are voluntary actions. Their implementation depends on the capability, circumstances, and capacity of the nation (UNFCC 2022a). Three phases in a REDD+ project include the readiness phase, implementation phase, and result phase (FAO 2022; UNFCC 2022b).

1. Readiness phase: Develop national strategies or action plans, policies, and measures. Assess the drivers and feasibility.
2. Implementation phase: Implement national policies and strategies through capacity building, technology development and transfer. Enable actions by proper land use planning, governance, private sector engagement, and financial mechanisms. Sectoral “AFOLU” actions (agriculture and agroforestry, forestry, other land-use sectors and landscape approaches).
3. Payments for results: Evolve into results-based actions that are fully measured, reported, and verified (MRV).

India is one of the largest CO₂ emitter countries in the world. But India progressed significantly in reducing emissions through systematic REDD+ implementation. The national REDD+ strategy, developed in 2018, supports several REDD+ projects in India (Chand et al. 2021). In addition to the national strategy or action plan, other critical elements of REDD+ in developing countries are the national forest monitoring system (MRV), forest reference level/forest reference emission level, and safeguard information system (MoEFCC 2018).

As a potent reducer of emissions from AFOLU (agriculture, forestry, and other land use), REDD+ mitigates climate change to a great extent (IPCC 2014; Stern 2007). Moreover, REDD+ provides various outcomes (Fig. 16.2) that contribute to SDGs directly or indirectly.

16.3 REDD+ and SDG

United Nations General Assembly in September 2015 developed seventeen Sustainable Development Goals (SDGs) and 169 related targets that together ensure a sustainable future by 2030. SDGs address several aspects of life on earth: socioeconomic well-being of people, environmental stability, and climate change and biodiversity conservation. Globally, these 17 goals are crucial in guiding and formulating the governance policy of several nations. The next 8 years are critical in fulfilling and contributing to those seventeen goals, where comes the importance of REDD+.

There is a mutual relationship between SDGs and REDD+ because REDD+ actions integrate sustainable management and conservation practices (Appiah et al. 2016). The countries engaged with REDD+ activities impart additional considerations on society and the environment using an integrated land-use planning approach (SDG Knowledge Hub 2018; UNEP 2018). It directly or indirectly paves a new path for sustainability. At the same time, SDGs widen the scope of pursuing REDD+ actions by providing additional institutional incentives. According to the Mongolia Ministry of Environment and Tourism report (REDD+ Mongolia 2017), REDD+ is a critical mitigation technique for GHGs and land degradation. In addition, the REDD+ strategy in Mongolia contributes to various SDGs that are not just related to the forest but also poverty eradication, ecotourism, and sustainable agriculture (REDD+ Mongolia 2017).

Among 17 SDGs, REDD+ potentially contributes to SDG 13 (climate action) and SDG 15 (life on land). REDD+ activities reduce emissions, enhance carbon sequestration, and mitigate climate change that fulfils SDG 13. Proper planning and implementation of REDD+ adapt the countries to sustainability in terms of climate action (SDG13) (UNEP 2018). On the other hand, SDG 15 aims to combat land degradation and desertification by conserving and restoring terrestrial ecosystems: forests, wetlands, dry lands, and mountains (Boer and Hannam 2019). Through sustainable management of ecosystems, SDG 15 tries to achieve a land-degradation neutral world, one of the outcomes of REDD+. Reducing emissions through deforestation and forest degradation sustains land productivity and food security. Successively, REDD+ improves the livelihoods of billions of people. Nowadays, several REDD+ projects highlight their role in achieving SDGs. Hence, merging REDD+ with SDGs not only improve the project's scope and success rate but also ensure sustainable co-benefits (Milbank et al. 2018). Table 16.1 listed the influential contribution of REDD+ projects to various sustainable development goals.

Milbank et al. (2018) investigated 25 REDD+ projects at the sub-national level and showed a strong alignment of their objectives with the SDG targets. Figure 16.3 shows REDD+ projects that are regularly monitored and improved to attain planned SDGs in the study. The number of REDD+ projects being valued for SDGs 4, 12, and 15 is high. The analysis reported a prominent gap in the planning and implementations of SDGs in those projects, which can be overcome by strengthening institutes that promote successful project operationalization. Also, the study explores the priorities of REDD+ projects and reveals their potential for positive change in SDGs.

16.4 Challenges and Recommendations

Even though REDD+ coordinates global emission reductions, it contains several challenges. The study in the Bosomtwe District, Ghana, through snowballing method and interviews from 12 communities, revealed that the knowledge of REDD+ and its intended benefit-sharing regimes is inadequate among the smallholder farmers (Appiah et al. 2016). Lack of knowledge is prominent within and among stakeholders regarding sectoral partnerships in REDD+ projects (Shin et al. 2022). Updated knowledge among people can develop with interactive awareness at the local level and scientific research at the institutional level.

Moreover, issues related to community rights, forest dependency, finance, capacity building, and policies often hinder effective REDD+ implementation (Chand et al. 2021). The comprehensive literature review by Kissinger et al. (2012) identified weak forest sector governance and institutions in 93% of countries. In some areas, the lack of decision-making information systems restricts the spread of REDD+ projects (Kissinger et al. 2012). A National Forest and Climate Change Strategy under REDD+ that is well-devised and systematically studied could overcome most of the issues related to policies at the national level. For the implementation of national projects, countrywide policy reforms and associated institutional

Table 16.1 Sustainable development goals and their contribution to the United Nation's Sustainable development goals

SDG	REDD+ contribution
1 No poverty	Helping countries to integrate biodiversity and ecosystem values into national and local planning and poverty reduction strategies (Milbank et al. 2018)
2 Zero hunger	Adoption of improved agricultural practices (Milbank et al. 2018); develop and implement an agricultural policy that contributes to national food security and rural development (Bernard et al. 2018)
3 Good health and Well-being	Ensure improvement of rural livelihood and their Well-being "Avoid unintended consequences on forest-dependent and forest-adjacent populations in developing countries" (Milbank et al. 2018)
4 Quality education	Equip forest institutes for quality implementation of REDD+, proper awareness and education to safeguard the capacity building, improve education, awareness-raising, and human and institutional capacity on climate change mitigation
5 Gender equality	Gender equity is ensured by relevant forest laws, policies, rules, regulations, administration, and management; reservations for women in joint forest management programs (Bernard et al. 2018; MoEFCC 2018)
6 Clean water and sanitation	Slowing and reversing water quality degradation (Alexander et al. 2011)
7 Affordable and clean energy	Address the issues related to the emissions from wood fuels (Bastos Lima et al. 2017)
8 Decent work and economic growth	Equip local communities to protect, regenerate and manage forests (MoEFCC 2018); economic upliftment through forest-based products (Hein and Meer 2012); "Creation of alternative livelihoods through programmes such as community forestry, sustainable biomass energy, community-based natural resource management and sustainable forest (eco)-tourism" (Bernard et al. 2018)
9 Industry, innovation, and infrastructure	REDD+ possesses a well-coordinated infrastructure that involves multiple stakeholders, law, policies, legislation, and governance (Bernard et al. 2018)
10 Reduced inequalities	Safeguards for rights of local communities through national strategies (Bastos Lima et al. 2017); respect for the knowledge and rights of indigenous people; empower a transparent and effective national forest governance structure (Bernard et al. 2018)
11 Sustainable cities and communities	Ecosystem management (Hein and Meer 2012); conserve forest carbon stocks (Bernard et al. 2018); increasing or enhancing the delivery of critical ecosystem services, equitable development and sustainable livelihoods in forest-dependent communities (Alexander et al. 2011)
12 Responsible consumption and production	Reduce human pressure on forests and address drivers of land degradation and deforestation (Bastos Lima et al. 2017); development of national forest monitoring system (Bernard et al. 2018)

(continued)

Table 16.1 (continued)

SDG	REDD+ contribution
13	Climate action
14	Life below water
15	Life on land
16	Peace, justice, and strong institutions
17	Partnerships for the goals

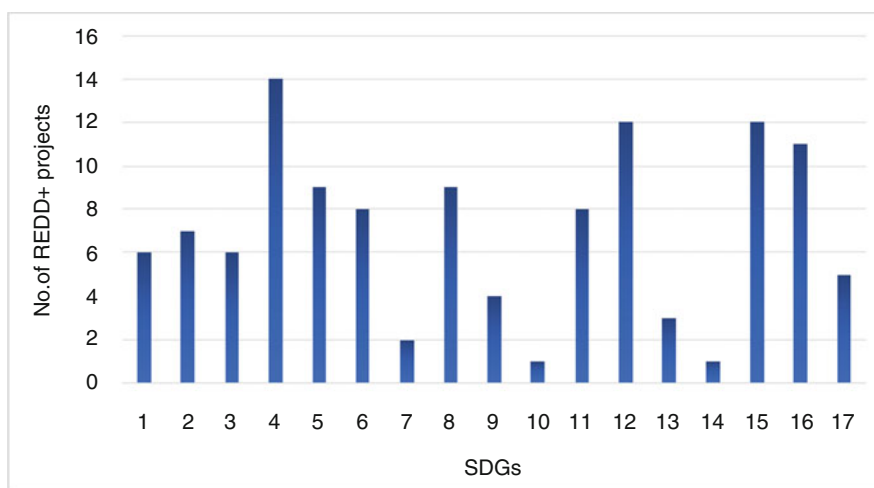
Design interventions that strengthen adaptive capacity and resilience to climate-related hazards and natural disasters
Integrate climate measures into national planning, policies, and strategies (UNEP 2018); reduce greenhouse gas emissions and increase carbon sequestration and long-term stability; enhance resilience and the ability of ecosystems and communities to adapt to adverse impacts of climate change (Alexander et al. 2011)

Conservation and sustainable use of inland freshwater ecosystems and their services (UNEP 2018)

Sustainable use of forests and halt deforestation; combat desertification; reduce habitat degradation and tackle biodiversity loss; promote equitable forest-based livelihoods (UNEP 2018); aims to land degradation neutral world (Boer and Hannam 2019)

People-centric approach for project implementation; enacting laws that secure peace and justice; institutional building (National Forest Monitoring Systems, Safeguard Information Systems, etc.), with the full and effective participation of all relevant stakeholders (Bastos Lima et al. 2017)

Partnership with multiple stakeholders is a vital component of REDD+; provides finance and technology to developing countries to support emissions reductions (Bastos Lima et al. 2017)

**Fig. 16.3** REDD+ projects (out of 25) with evidence of monitoring and improvements on 17 SDGs. (Data extracted from Milbank et al. 2018)

support are mandatory. It restricts the practical application of several REDD+ objectives. Hence, small-scale projects at the sub-national level with people-private partnerships widen the opportunities and scope of REDD+ (Chacón-Cascante et al. 2011).

Another concern in the REDD+ is the difficulty in assessing and monitoring the project implementation. Remote sensing data regarding forest degradation is not always accurate and precise compared to the actual field condition. Therefore, Danielsen et al. (2011) suggest the need for a community-based monitoring system that monitor report and verify REDD+ outputs by ensuring the participation of local communities. By doing so, developing nations can ensure emission reductions from traditional practices and provide livelihood security. Currently, REDD+ objectives are limited to forests, but more explorations need to be done in wetlands, coastal sea grasses, and grasslands since they are good carbon sinks.

Preventing deforestation will not be enough to reduce the emissions for a sustainable future. Agroforestry is a boon in that situation that integrates crops, trees, and/or pastures more or less following typical forest multi stratified structure and diversity. Moreover, agroforestry systems can practice in several geographic and weather conditions: arid, semiarid, dry, and wet regions. The national strategies and action plans are well aware of the importance of agroforestry (Kumar et al. 2021). Agroforestry-oriented projects are recommended in policies to combat desertification and land degradation.

16.5 Conclusion

Reducing emissions from deforestation and forest degradation reverses forest land degradation and greenhouse gas emissions. Additionally, REDD+ practices contribute to all 17 sustainable development goals directly or indirectly. REDD+ opens up a new framework and path for forest management through policy-level changes, multi-stakeholder participation and carbon credit trades. Bottom-up awareness about its phases and structure will equip individuals, societies, communities, and nations to be economically ahead while maintaining sustainability.

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