



# LEX TERRA

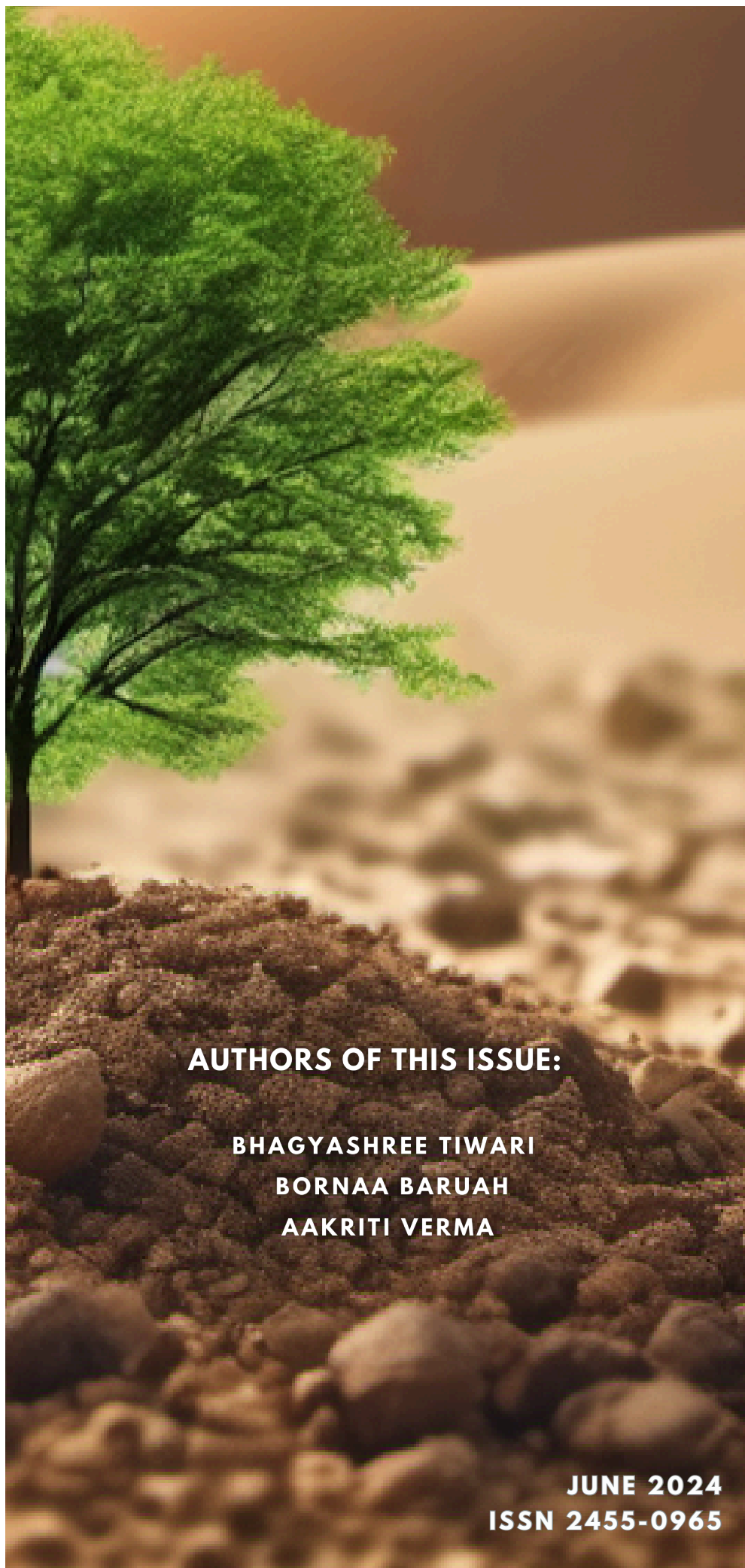
CENTRE FOR ENVIRONMENTAL LAW, ADVOCACY AND RESEARCH

ISSUE 45

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JUNE 2024  
ISSN 2455-0965



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ISSN: 2455-0965

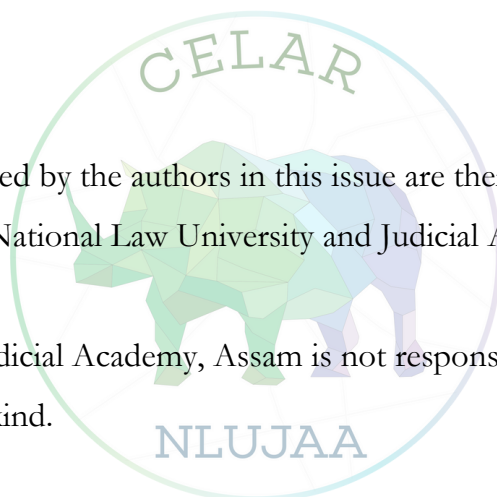
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This issue shall be cited as:

[Author's name], [*Title of the Article*], [LT 45] [LEX TERRA], [Page(s) Cited] [(2024)]

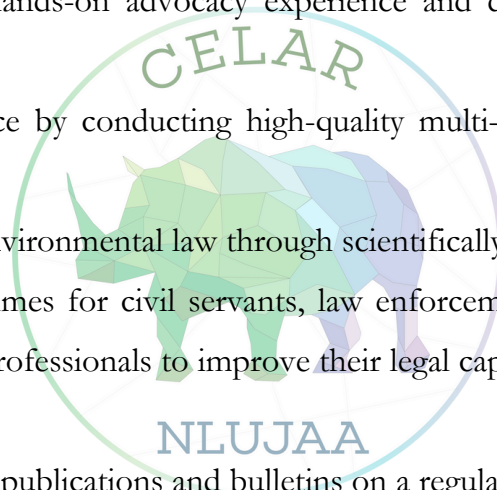
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# ABOUT CELAR

The fundamental aim of the **Centre for Environmental Law, Advocacy, and Research (CELAR)**, National Law University and Judicial Academy, Assam, is to participate in advocacy and research on public interest environmental concerns. It endeavours to do so by holding workshops and seminars to educate and improve skills, convening conferences to encourage an exchange of ideas, conducting training programmes for capacity building in environmental law issues, undertaking legal research, and publishing newsletters and journals regularly.

The main objectives of CELAR can be elucidated as follows:

- Providing students with hands-on advocacy experience and direct exposure to the issues to inspire and educate them.
- Strengthen access to justice by conducting high-quality multi-disciplinary research on current environmental legal issues.
- Advocate for reforms in environmental law through scientifically sound legislative proposals.
- Organize training programmes for civil servants, law enforcement agencies, non-governmental organisations, and media professionals to improve their legal capacity on environmental laws and policy.
- Publish environmental law publications and bulletins on a regular basis.



Thus, to meet the last objective, *'Lex Terra'* is an initiative undertaken by CELAR. Through Lex Terra, we strive to provide a voice to various aspects of the environment, published quarterly, to create a community of environmentally conscious individuals from the legal and non-legal fraternity. Each issue of Lex Terra features important environmental news from across the world and from within the nation. This bulletin is meticulously compiled by CELAR members and is dedicated to enviro-legal enthusiasts around the country.

# EDITORIAL NOTE

In honor of World Environment Day 2024, *Lex Terra* - Issue 45, shines a spotlight on this year's theme: "*Land Restoration, Desertification, and Drought Resilience*." These interconnected challenges represent some of the most urgent environmental issues of our time. As climate change accelerates, so too does the degradation of land and the intensification of droughts, threatening ecosystems and human livelihoods worldwide.

The degradation of land is a silent crisis that affects nearly one-third of the Earth's surface. This degradation leads to loss of biodiversity, reduced agricultural productivity, and increased vulnerability to climate change. Land restoration, therefore, is not merely about rehabilitating landscapes but about renewing ecosystems, supporting biodiversity, and enhancing the resilience of communities. Successful restoration projects around the world, such as the Great Green Wall in Africa and large-scale reforestation efforts in China and India, demonstrate the transformative power of restoring degraded lands.

Desertification, the process by which fertile land becomes desert as a result of drought, deforestation, or inappropriate agriculture, is a growing concern. It currently affects over 100 countries and impacts the livelihoods of more than 1 billion people. The causes of desertification are often multifaceted, involving unsustainable land management practices, overgrazing, deforestation, and climate change. Addressing desertification requires integrated approaches that combine sustainable land management, water conservation techniques, and community engagement. Innovative solutions, such as agroforestry, conservation agriculture, and water harvesting, are pivotal in reversing desertification trends and reclaiming degraded lands.

As climate change brings about more frequent and severe droughts, building resilience to these conditions is crucial. Drought resilience involves not only adapting agricultural practices and improving water management but also strengthening the social and economic systems that support affected communities. Strategies such as drought-resistant crops, efficient irrigation systems, and improved soil management practices play a vital role.

Additionally, policies and frameworks that support sustainable water use and safeguard water resources are essential for ensuring long-term resilience against droughts. This year's theme for World Environment Day underscores the importance of these issues and calls for urgent action at all levels—local, national and global. It is a reminder that the health of our land and ecosystems is intrinsically linked to our own survival and well-being. The African Union's Great Green Wall aims to restore 100 million hectares of degraded land across 11 countries, creating a mosaic of green and productive landscapes. In South America, the "Trinational Atlantic Forest Pact" is working to restore and protect one of the world's most diverse ecosystems, spanning Brazil, Argentina, and Paraguay. Meanwhile, in Asia, China's "Loess Plateau Watershed Rehabilitation Project" has turned one of the most eroded areas into a green and productive landscape through large-scale terracing and sustainable farming practices.

This World Environment Day, we are called to reflect on the critical importance of land restoration and the need to address desertification and drought resilience. It is a call to governments, organizations, and individuals to take bold and concerted actions to restore our lands and build resilient communities. By investing in nature-based solutions, adopting sustainable land management practices, and fostering community-led initiatives, we can restore degraded lands, halt the spread of deserts, and build a future where both people and nature thrive.

In this issue of *Lex Terra*, we explore inspiring stories and strategies from around the world that highlight the importance of land restoration, the fight against desertification, and building resilience to drought. Join us as we delve into these critical issues and discover how each of us can contribute to a healthier, more sustainable planet.

In the *first* article, the author emphasizes the importance of land restoration, desertification prevention, and drought resilience in addressing contemporary environmental challenges and securing a sustainable future. Highlighting the efforts led by the UN Convention to Combat Desertification (UNCCD), the author discusses how restoring degraded lands not only enhances biodiversity and carbon sequestration but also creates green jobs, improves food security, and strengthens community resilience. The restoration of vast areas in Africa's Sahel region is showcased as a critical socio-economic initiative benefiting millions. The author advocates for innovative risk-sharing mechanisms and community-based governance to boost the adaptive capacities of vulnerable populations against climate change.

Promoting land degradation neutrality (LDN) through balanced policies that integrate conservation, sustainable use, and restoration is seen as essential to managing the complex interplay between social, economic, and environmental demands. As World Environment Day 2024 approaches, the article calls for a committed and cost-effective approach to land restoration and environmental protection, underscoring that today's decisions will shape the future well-being of our planet and its inhabitants.

In the *second* article, the author underscores the critical need for comprehensive land restoration laws in India to rehabilitate 26 million hectares of degraded land by 2030. Achieving this goal requires setting clear annual and state-wise targets, acknowledging lands already restored, and addressing newly degraded areas. Effective restoration should be driven by criteria such as the ease of rehabilitation, regional vulnerability, community benefits, cost-effectiveness, and enhanced environmental services. The author advocates for integrated land-use plans that combine afforestation with other sustainable practices to prevent erosion and desertification. Engaging indigenous communities to revive traditional agroforestry practices and incorporating local knowledge into modern restoration strategies are highlighted as key to successful land management. Promoting agroforestry models will enhance biodiversity and productivity, contributing to sustainable land use. As we pursue a comfortable lifestyle, the article calls for a recognition of our ecological debt and a commitment to sustaining our environment. Adhering to the United Nations' Sustainable Development Goals and fostering sustainable forest development are vital for maintaining ecological balance and securing our future.

In the *third* article, the author highlights the urgent need to address desertification through initiatives like social forestry and wasteland development, emphasizing that these programs must align with the ecological requirements of natural processes. Prior to 2015, desertification was often overlooked in water management policies at both global and domestic levels. The essay's central theme is that combating desertification requires solutions that are both ecologically sustainable and socially equitable. Effective strategies must integrate ecological and social considerations to ensure that restored landscapes benefit all communities, not just the privileged few. By fostering resilience through ecologically sound and socially just approaches, we can create landscapes that support diverse communities and sustain environmental health.

*Lex Terra* Editorial Board

2023 - 2024



# REVIVING OUR PLANET: GLOBAL INITIATIVES FOR LAND RESTORATION AND CLIMATE RESILIENCE

-Bhagyashree Tiwari\*

*“Sustainable development is the pathway to the future we want for all. It offers a framework to generate economic growth, achieve social justice, exercise environmental stewardship, and strengthen governance.”<sup>1</sup>*

- Ban Ki Moon

The historic Stockholm Conference on the Human Environment was the first collective global effort to address climate action. The United Nations General Assembly (UNGA) designated the start of the conference on 5<sup>th</sup> June as World Environment Day. It serves as an opportunity for international organizations, governmental and non-governmental organizations as well as individuals to reflect on the triple planetary crisis: climate change, nature and biodiversity loss, and pollution and waste. These interlinked crises have been on a consistent rise and continue to cause significant harm to diverse ecosystems across the planet. This day stands as a caution to incessant and inconsiderate industrial expansion and urges us to focus more on contributing to building a more sustainable future with collective efforts and innovative solutions to protect and restore our environment.

## I. SAUDI ARABIA: HOST OF WORLD ENVIRONMENT DAY 2024

The Kingdom of Saudi Arabia will host World Environment Day 2024 with a focus on land restoration, desertification, and drought resilience<sup>2</sup>. Land restoration is a key pillar of the UN Decade on Ecosystem Restoration (2021-2030), a rallying call for the protection and revival of ecosystems all around the world, which is critical to achieving the Sustainable Development Goals.<sup>3</sup> The 15<sup>th</sup> Sustainable Development Goal (SDG) talks specifically about protecting, restoring, and promoting sustainable use of terrestrial ecosystems, sustainably

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<sup>1</sup> Ban Ki Moon, the United Nations Conference on Sustainable Development (Rio+20), Rio de Janeiro, Brazil, Jun. 2012.

<sup>2</sup> United Nations Environment Programme, *Saudi Arabia to Host World Environment Day 2024 with a Focus on Land Restoration, Desertification, and Drought Resilience*, UN ENVIRONMENT, (Jun. 3, 2024), <https://www.unep.org/news-and-stories/press-release/saudi-arabia-host-world-environment-day-2024-focus-land-restoration>.

<sup>3</sup> *Id.*

managing forests, combating desertification, and halting and reversing land degradation and halting biodiversity loss.<sup>4</sup>

### *1.1. Initiatives undertaken by Saudi Arabia*

The Kingdom of Saudi Arabia has taken proactive steps to combat degradation, desertification and drought through national and regional initiatives like the Saudi Green Initiative and the Middle Eastern Green Initiative. The G20 Presidency of Saudi Arabia concluded with the adoption of the resolution on the Global Land Restoration Initiative. This marked the first collective resolution by the G20 nations across the globe to take collective action focusing on Land Restoration. Land Restoration efforts can have a strong impact in reversing land degradation and desertification in drought-prone regions. Restoring ecosystems enhances livelihoods, reduces poverty, and strengthens resilience against extreme weather. It can also help in enhancing carbon storage and mitigate the negative effects of climate change. Up to sixty percent of predictions about the extinction of species can be averted by restoring only fifteen percent of land in drought-prone regions. The G20 nations have shown global harmony in the climate agenda and the Kingdom being a part of it continues to work proactively towards land restoration.

### *1.2. Driving Global Action for Land Restoration and Drought Resilience*

66<sup>th</sup> session of the UNGA resulted in the adoption of the resolution ‘Future We Want’ in the year 2012. Paragraphs 205 to 208 of the resolution recognize the vital socio-economic role of effective land management. They emphasize soil management specifically, aiming to promote economic growth and social development. Their dedication to addressing the urgent issue of soil erosion is demonstrated through partnerships and initiatives designed to protect land resources. At the same time, they consider future development and innovative conservation strategies, working towards the advancement and implementation of scientifically robust and socially inclusive methods for monitoring and assessing desertification and erosion. This is hand in glove with the ongoing scientific research on the issue of drought and desertification under the aegis of the United Nations Convention to Combat Desertification (UNCCD). It stresses the necessity for actions at all levels to tackle land degradation.

The Commission on Sustainable Development (CSD) has addressed the issues of combating desertification and drought in multiple sessions. As part of its multi-year work programme,

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<sup>4</sup> The Global Goals, *Goal 15: Life on Land*, (Jun. 1, 2024), <https://www.globalgoals.org/goals/15-life-on-land/>.

CSD sessions 16 and 17, held in 2008 and 2009, specifically focused on these challenges. They also examined related topics such as land, agriculture, rural development, and the situation in Africa. These discussions form the foundation for all efforts aimed at restoring degraded land.

With Saudi Arabia all set to host World Environment Day 2024, it is also the host for the UNCCD Conference of Parties (COP) in December this year. The collective action in these events can pave the way for global cooperation in attaining the goals of sustainable development with a healthy future that has its focus on these restoration goals, climate change, and the well-being of flora and fauna. With the twin events for the same cause being hosted by Saudi Arabia, there is hope that the conferences will result in fruitful outcomes for boosting the livelihoods of the poor and feeding the billions of hunger-stricken population of the world.

## **II. COMBATING DESERTIFICATION, SOIL EROSION AND LAND DEGRADATION**

Land is a quintessential resource for the production of food grains, sustenance of forests, maintenance of soil, regulation of water cycles, and storage of carbon. The livelihood and well-being of the local and indigenous communities are closely connected to forests and land resources. Land degradation, driven by human activities and natural processes, diminishes biodiversity and ecosystem functions, negatively impacting ecosystem services, food security, and socio-ecological resilience. Particularly in drylands, this process is known as desertification. Drought, similarly, disrupts ecological and economic systems globally, with serious drought areas having doubled since the 1970s. Land degradation, desertification, and drought (DLDD) are global issues, with 78% of degraded land outside drylands, affecting 1.5 billion people, disproportionately impacting women and children. Addressing DLDD requires coordinated, coherent international policies.<sup>5</sup>

Agricultural expansion and deforestation further strain land resources, exacerbated by population growth, climate change, and unsustainable practices. By 2030, demands for food, energy, and water are expected to rise sharply, necessitating an increase in agricultural productivity. Sustainable Land Management (SLM) offers a solution, improving soil and water management, enhancing food security, energy access, and water availability, and alleviating rural poverty.

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<sup>5</sup> UNITED NATIONS, Issue Brief: Desertification, Land Degradation, and Drought, <https://sdgs.un.org/sites/default/files/documents/1803stissuesdlldd.pdf> (last visited Jun. 1, 2024).

According to a contemporary study,<sup>6</sup> the global community is losing up to 5% of total agricultural gross domestic production (GDP) due to land degradation, costing some US\$490 billion per year. The direct economic costs of land degradation at country level vary widely, with some as high as 6.6% of GDP in Paraguay, 9% in Burkina Faso and 24% in Guatemala. In China, over 400 million residents are affected by desertification, causing an annual direct economic loss that exceeds USD 10 billion.<sup>7</sup>

To effectively combat DLDD, its drivers need to be addressed and instruments designed to incentivize SLM. Embedded in the understanding of the economics of DLDD is a set of methodologies for assessing the true societal impacts of land degradation, which includes issues such as forced migration and conflicts over scarce natural resources. These form the foundation for determining how to best allocate financial, technical, and human resources to effectively tackle DLDD.<sup>8</sup>

### **III. LAND RESTORATION**

Land restoration involves the cessation of degradation or the revitalization of deteriorated land, often through endeavours such as afforestation, soil preservation, and safeguarding natural mechanisms. Its objective is to bolster biodiversity, reinstate ecosystem functions, and alleviate the consequences of climate change. Consequently, it plays an important role in advancing various SDGs. Land restoration holds immense promise in aiding global efforts to curb climate change and realize sustainable development objectives.

#### *3.1. Land Restoration: Benefits and Approaches*

Healthy land supports robust ecosystems, providing numerous benefits such as improved soil fertility, increased water retention, and prevention of land degradation. By restoring land, biodiversity is conserved as habitats for plants, animals, and microorganisms are maintained, which supports overall ecosystem health. However, land degradation poses significant global challenges, affecting 25% of the Earth's land surface due to activities like deforestation, unsustainable agriculture, urbanization, and mining. This degradation leads to ecological

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<sup>6</sup> United Nations Convention to Combat Desertification, *The Economics of Desertification, Land Degradation and Drought: Methodologies and Analysis for Decision-Making. Background document*. UNCCD 2nd Scientific Conference, <http://2sc.unccd.int> (last accessed 28 March 2024).

<sup>7</sup> *Id.*

<sup>8</sup> UNITED NATIONS, Issue Brief, *supra* note 5.

imbalances and the loss of essential ecosystem services that are crucial for human well-being and livelihoods.<sup>9</sup>

Rehabilitating degraded lands demands a range of strategies adapted to local circumstances and community requirements. Methods may involve reintroducing indigenous flora, embracing sustainable land management techniques, setting aside protected zones, and implementing agroforestry systems to improve soil quality and output. Moreover, land restoration plays a crucial role in addressing climate change, with fertile soils acting as significant carbon reservoirs by absorbing and retaining considerable quantities of carbon dioxide. Engaging local stakeholders in restoration endeavours is imperative, as their participation ensures effective execution, promotes sustainable livelihoods and nurtures a robust bond with the land.

### *3.2. The Role of Indigenous, Tribal and Local Communities*

Indigenous as well as the local communities, comprising at least 370 million people globally, play a critical role in managing and restoring land, and retaining strong cultural, economic, and social ties to their ancestral lands. These communities steward over 15% of the world's land, including 40% of protected regions and ecologically intact landscapes. Their traditional practices often result in sustainable land management, as seen in the return of 160,000 hectares of rainforest in Australia to the Eastern Kuku Yalaji community, leading to lower deforestation rates and enhanced biodiversity. Local communities possess deep ecological knowledge from millennia of land management, which informs effective restoration practices. Their involvement ensures sustainable management and the preservation of biodiversity, as evidenced by successful projects in Nepal and Finland.

The UNGA declared the decade 2021-2030 as the Decade on Ecosystem Restoration and in India, restoration targets are evident in several flagship programmes. The participation of indigenous and local communities in restoration efforts is crucial for successful, long-term ecosystem recovery. Their traditional knowledge helps identify keystone species and inform fire management, as seen with the Australian Aborigines' use of fire for land management. Local communities also monitor ecosystem health, contributing to data collection and restoration success, such as in the Niger Delta's oil spill monitoring. They maintain genetic diversity through traditional farming practices, cultivating diverse crop species adapted to changing conditions. Examples include Mexican farmers developing native maize varieties and

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<sup>9</sup> Pamela Chasek, *From Land Degradation to Land Restoration- Policy Brief #29*, IISD EARTH NEGOTIATION BULLETIN, (2024).

Peruvian farmers cultivating a significant portion of the country's potato varieties. Their involvement enhances biodiversity, mitigates climate change, and ensures the sustainable management of natural resources.

#### **IV. IMPLEMENTING THE DROUGHT RESILIENCE, ADAPTATION AND MANAGEMENT POLICY (DRAMP) FRAMEWORK**

The technical guidelines provided by the UNCCD and the DRAMP Framework provide essential information for developing and implementing national drought resilience and management plans. The DRAMP Framework integrates six goals: reducing exposure and vulnerability to drought, increasing resilience, transforming socio-economic and ecological systems, preparing and responding to drought, and sharing drought risks. These guidelines help countries set up systems for monitoring drought, issuing early warnings, assessing vulnerability and risk, and implementing measures to reduce the impact of drought. Drought planning, facilitated by these guidelines, allows decision-makers to identify vulnerable regions and sectors, allocate resources efficiently, and involve communities in transparent, inclusive planning processes, ultimately enhancing resilience to climate change-induced drought and land degradation.<sup>10</sup>

The DRAMP Framework outlines a multi-pronged approach to reducing drought risks by focusing on six interconnected goals. Examples include diversifying crops to reduce agricultural losses and involving local communities in drought decision-making. Practical measures include comprehensive drought monitoring, vulnerability assessments, and structural and non-structural interventions. These actions, guided by the UN-Water Decade Programme and supported by extensive scientific literature, aim to build national capacity for effective drought management and resilience.

#### **V. DROUGHT CONDITIONS AND MITIGATION STRATEGIES IN INDIA**

The country report on drought conditions and plausible management strategies in India, presented at the UN-Water Initiative workshop in Hanoi, Vietnam, highlights the significant impact of drought on various sectors of the Indian economy, particularly agriculture. India's vulnerability to drought is underscored by its high dependence on rainfall for agricultural activities and the prevalence of rain-fed farming. Despite experiencing three major droughts between 2002 and 2012, India has been steadily improving its capacity to mitigate the adverse

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<sup>10</sup> Neville D. Crossman, *Drought Resilience, Adaptation and Management Policy Framework: Supporting Technical Guidelines*, U.N. Convention to Combat Desertification, 2019.

effects of drought through technological advancements, policy measures, and diversified rural economic activities. The report emphasizes the importance of early warning systems, vulnerability assessments, and emergency relief measures in managing drought effectively, alongside the need for integrated approaches at national and regional levels to enhance resilience and adaptive capacity.

Moreover, India's legal and institutional frameworks for disaster management, including the role of the National Disaster Management Authority (NDMA) and various ministries and agencies in coordinating drought response efforts. It discusses key policies and programs aimed at mitigating the impact of drought, such as the National Policy on Disaster Management and initiatives like the Mahatma Gandhi National Rural Employment Guarantee Scheme. Additionally, financial mechanisms like the National Disaster Response Fund and agricultural insurance schemes are highlighted as crucial for providing relief to affected populations. The report also emphasizes the importance of community engagement, indigenous knowledge, and capacity building to strengthen drought management capabilities across the country.<sup>11</sup>

#### *5.1. National Action Plan to Combat Desertification and Land Degradation*

Desertification, a multifaceted issue requiring interdisciplinary approaches, poses significant challenges to ecological sustainability and community livelihoods globally. In India, where nearly 30% of the geographical area is affected, the problem is particularly acute, with implications for both the economy and the well-being of millions. The annual cost of degradation is substantial, amounting to 2.5% of India's GDP. Urgent action is imperative to address desertification and land degradation,<sup>12</sup> with restoration efforts focusing on a variety of land uses and interventions, from agroforestry to habitat protection and assisted natural regeneration.

India has demonstrated leadership in combating land degradation through proactive policies and interventions. The revised National Action Plan emphasizes a landscape approach to restoration, integrating regional strategies and leveraging international expertise. While numerous eco-restoration schemes are in place, there's a pressing need for synergistic planning and implementation. The plan highlights the importance of participatory approaches, involving

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<sup>11</sup> Brij Mohan Singh Rathore et al., *Country Report prepared for the Regional Workshop for Asia-Pacific as part of the UN-Water Initiative*, the Regional Workshop, Hanoi, Vietnam (May 6-9, 2014).

<sup>12</sup> Ministry of Environment, Forest and Climate Change, *India's National Plan (NAP) to Combat Desertification and Land Degradation through Forestry Interventions* (2023).

stakeholders at various levels, and emphasizes the significance of converging afforestation schemes to maximize impact and promote sustainable management of forest resources.

Efforts are underway to restore millions of hectares of the vast degraded and eroded land by the year 2030, with an emphasis on generating additional carbon sinks and enhancing South-South cooperation. Afforestation and agroforestry are key strategies, with the potential to contribute significantly to carbon sequestration. Regional collaboration and value chain development for native species are deemed essential for building resilient landscapes. The urgency of restoration cannot be overstated, given its role in addressing desertification, food insecurity, climate change, and biodiversity loss, not only in India but globally.

### *5.2. Combating Land Degradation in the Indian Way*

India has launched a series of initiatives aimed at combating land degradation and promoting afforestation, reflecting a comprehensive approach to environmental conservation. One such initiative is the Nagar Van Yojana, introduced in 2020, which focuses on creating 1000 urban forests across cities to enhance green spaces and contribute to cleaner, greener, and more sustainable urban centers. Additionally, state-specific programs like Mission Haritha Haram in Telangana<sup>13</sup> and the Green Wall initiative in Haryana explain the efforts to increase green cover and restore degraded landscapes, emphasizing the importance of regional approaches tailored to local contexts.

To support these efforts, India has introduced several national policies and missions aimed at improving forest resources and biodiversity. The National Forest Policy of the year 1988 and the National Mission for a Green India are central to this strategy. Additionally, India's engagement in international conservation efforts showcases its dedication to global environmental challenges. For example, India's pledge to the Bonn Challenge involves a commitment to restore degraded land by 2030. This ambitious target is testimony to India's proactive role in promoting global environmental sustainability and conservation efforts.

### *5.3. Restore Land, Sustain Future: the Indian Presidency of COP-14*

The 14th Conference of Parties (COP-14) to the UNCCD, hosted by India with the theme 'Restore land, Sustain future', concluded with significant commitments including the Delhi Declaration focusing on gender, health, and ecosystem restoration, and the adoption of the SDG target for land degradation neutrality by 2030. Key initiatives like the Peace Forest Initiative,

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<sup>13</sup> Haritha Haram, <https://www.myscheme.gov.in/schemes/haritha-haram> (last visited May 29, 2024).



Drought Toolbox, and the International Coalition for Action on Sand and Dust Storms were launched, alongside India's proposals for greater South-South cooperation, setting up a global technical support institute, and advocating for a global water action agenda.

Despite these initiatives, challenges such as soil erosion, desertification, and competing land uses persist. Addressing these challenges requires integrated landscape management, science-based species selection, and sustainable financing mechanisms. By leveraging traditional ecological wisdom, promoting eco-entrepreneurship, and investing in monitoring, research, and innovation, India can advance its efforts towards resilient ecosystems, sustainable livelihoods, and a greener future.

## **VI. WAY FORWARD**

As we reflect on the pressing environmental challenges of our time, we must recognize the critical role land restoration, desertification prevention, and drought resilience play in securing a sustainable future. The efforts spearheaded by the UNCCD are examples of the transformative potential of coordinated action. By restoring degraded lands, we not only enhance biodiversity and sequester carbon but also create green jobs, improve food security, and foster resilient communities. The restoration of millions of hectares of land in Africa's Sahel region is not just an environmental imperative but a socio-economic lifeline for millions.

With innovative risk-sharing mechanisms and enabling community-based governance, the adaptive capacities of vulnerable populations are enhanced so they are better prepared to withstand the adverse effects of climate change. Moreover, promoting land degradation neutrality (LDN) through policies that balance conservation, sustainable use, and restoration will enable us to navigate the complex trade-offs between social, economic, and environmental needs. As the world strives towards achieving LDN by 2030, we must leverage regional collaboration and knowledge sharing to scale up successful restoration practices globally.

As we commemorate World Environment Day 2024, our commitment to land restoration, combating desertification, and bolstering drought resilience should be substantiated by cost-effective measures that can balance industrial growth and the environment. The choices we make today will shape the health and prosperity of our planet and its people for years to come. Together, we can turn the tide against land degradation and build a resilient and sustainable future.

# NEED FOR LAND RESTORATION LAWS IN INDIA: AN ANALYSIS

-Bornaa Baruah\*

## I. INTRODUCTION

About 29% of the Earth's surface is made up of land, covering an area of 149 million square kilometres. Of this land, only 71% is suitable for human habitation, with the remaining 29% considered unsuitable.<sup>14</sup> Within this context, India occupies 2.4% of the world's land area, yet it is home to 18% of the global population. Notably, within India's 2.4% share of global land, 29.77% of the 'Total Geographic Area' is experiencing land degradation.<sup>15</sup> 'Land Degradation' is defined as "a state of continuous decline in the level of ecosystem services over an extended period."<sup>16</sup> The primary cause of land degradation in the nation is Water Erosion, which accounted for 11.01% in 2018-19, followed by Vegetation Degradation at 9.15% and Wind Erosion at 5.46%.<sup>17</sup> Land degradation in dryland areas, including arid, semi-arid, and dry sub-humid regions, is referred to as 'Desertification.' 'The United Nations Convention to Combat Desertification (UNCCD)' defines desertification as "the land degradation in arid, semi-arid and sub-humid areas resulting from various factors, including climatic variations and human activities."<sup>18</sup>

Approximately 3 billion individuals globally are affected by land degradation, a matter of increasing global significance in recent times. With 41% of its land degraded by human activity, 70% of which is severely degraded, South Asia has suffered the most.<sup>19</sup> With 20% of degraded land and 75% of severely degraded land, West Asia is behind Southeast Asia in this category. The primary reasons for land degradation in arid, semi-arid, and dry-humid countries experiencing drought stem from fluctuations in climate and human interventions. Given the

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\* Second year student at National Law University and Judicial Academy, Assam.

<sup>14</sup> Sanjay Singh, Krishna Giri, Gaurav Mishra, Manoj Kumar, Ram Kumar Singh, Sandeep Pandey, Monish Mullick & Rajesh Sharma, *Pathways to Achieve Land Degradation Neutrality in India*, Centre of Excellence on Sustainable Land Management – Indian Council of Forestry Research and Education (June 1, 2024, 8:10 PM), <https://icfre.gov.in/publication/publication51.pdf>.

<sup>15</sup> Space Applications Centre (SAC) ISRO, *Desertification and Land Degradation Atlas of India (Assessment and analysis of changes over 15 years based on remote sensing)*, SAC, ISRO, Ahmedabad (June 1, 2024, 8:41 PM), [https://vedas.sac.gov.in/static/atlas/dsm/DLD\\_Atlas\\_SAC\\_2021.pdf](https://vedas.sac.gov.in/static/atlas/dsm/DLD_Atlas_SAC_2021.pdf).

<sup>16</sup> Zafar Adeel, Uriel Safriel, David Niemeijer & Robin White, *Ecosystems and Human Well-Being*, Millennium Ecosystem Assessment (June 1, 2024, 9:26 PM), <https://www.millenniumassessment.org/documents/document.355.aspx.pdf>

<sup>17</sup> *Id* at 2.

<sup>18</sup> 'United Nations Convention to Combat Desertification, Article 1 (1994).'

<sup>19</sup> *Id* at 1.

estimate that by 2050, 90% of Earth's land might deteriorate and that 75% of it has already been destroyed, it is imperative that all nations review their environmental policies with regard to desertification and land degradation.<sup>20</sup>

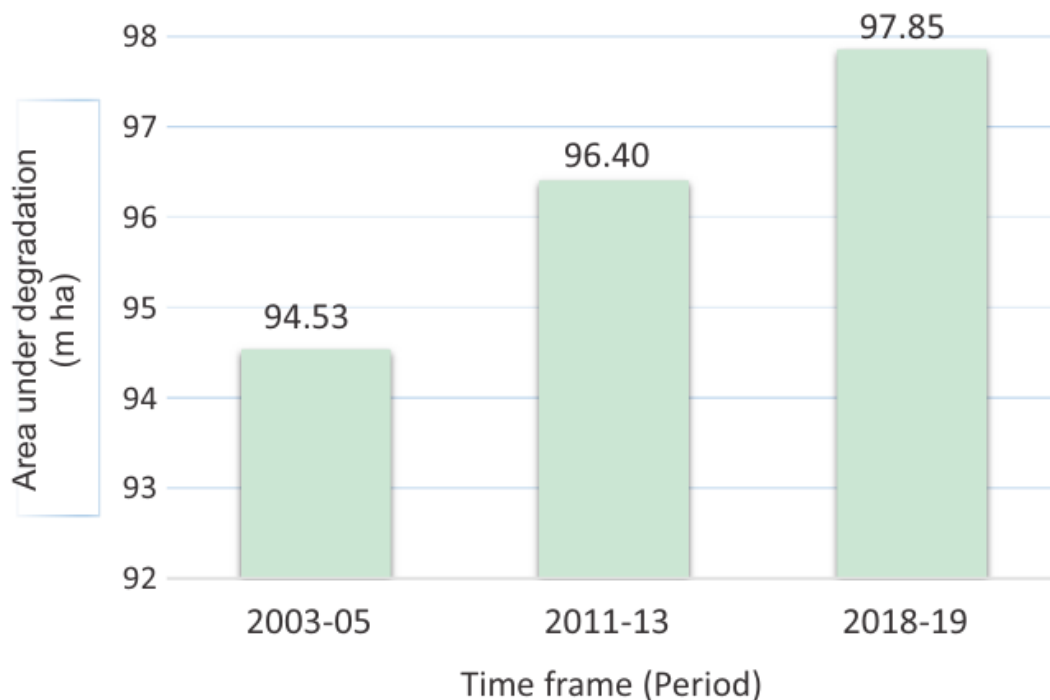


Figure: Area under degradation from 2003-05 to 2018-19

## II. DIFFERENT METHODS OF LAND DEGRADATION IN INDIA

In India, the significant methods of 'desertification/degradation' are –

### i) Vegetation degradation

Vegetation deterioration, resulting from deforestation and excessive grazing, results in soil deterioration due to erosion and depletion of organic material.<sup>21</sup> This process diminishes soil fertility, water-holding capacity, and nutrient content, making soil more vulnerable to erosion. Consequently, it imposes stress on vegetation survival, exacerbating the cycle of degradation. Agricultural practices in forests also contribute to vegetation degradation.

<sup>20</sup> Cherlet, M., Hutchinson, C., Reynolds, J., Hill, J., Sommer, S. and Von Maltitz, G., *World Atlas of Desertification*, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-75350-3, doi:10.2760/9205, JRC111155.

<sup>21</sup> Rajit Sengupta, *Land degradation in India hurts farmers and forest dwellers the most*, DownToEarth, August 27, 2021, <https://www.downtoearth.org.in/news/environment/land-degradation-in-india-hurts-farmers-and-forest-dwellers-the-most-78701>

ii) Water Erosion

Water erosion, which refers to the depletion of soil cover mainly caused by rainfall and runoff, can be classified into three levels of seriousness: sheet/rill erosion, gully erosion, and ravine erosion. Sheet and rill erosion, typically occurring within agricultural lands, are classified as slight erosion. Narrow and shallow gullies fall under moderate erosion, whereas deep and wide gullies and ravines are considered severe erosion. It leads to loss of soil nutrients and in turn, affects crop productivity and food security.<sup>22</sup>

iii) Wind Erosion

Wind erosion, a process associated with Aeolian activities, involves the dispersal of sand through various mechanisms, reaching even the lofty altitudes of the Himalayas. Soil becomes especially prone to wind erosion when certain conditions are present, like sparse or lacking vegetative covering, heightened wind speeds, loose, dry, fine, or extremely light soil, smooth soil surfaces, and expansive exposed areas. This phenomenon results in the removal of the nutrient-rich topsoil, essential for plant growth and bacterial activity. Consequently, the loss of topsoil diminishes the soil's functional capacity and restricts its potential for future agricultural use. Additionally, windblown dust or sand can settle on cultivated lands, burying them and thereby reducing their productivity.

iv) Water Logging

Water logging refers to the situation where the water saturates, resulting in undrained land parcels accumulating standing water for extended periods. This condition is characterized by nearly saturated soil, restricting its air phase, which is detrimental to agricultural productivity as various crops require soil aeration to varying depths. The magnitude of water logging depends on the extent of water stagnation.<sup>23</sup> Factors contributing to rising water tables include floods, salt-rich hard pans, excessive irrigation, and improper drainage planning. Furthermore, water logging can also lead to soil salinization.

v) Salinity/Alkalinity

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<sup>22</sup> National Academy of Agricultural Sciences, *Mitigating Land Degradation due to Water Erosion*, Policy Paper No. 88, New Delhi (June 3, 2024) <https://naas.org.in/Policy%20Papers/policy%2088.pdf>.

<sup>23</sup> Jeet Singh, *Regeneration of Degraded Land in Indi: Challenges and Possibilities*, Rajiv Gandhi Institute of Contemporary Studies, New Delhi, 2020 (June 4, 2024) <https://www.rgics.org/wp-content/uploads/Land-Regeneration.pdf>.

Salinity or Alkalinity, are fundamentally chemical properties of soil, that predominantly affect cultivated lands, particularly irrigated areas. It can arise naturally or due to human activities. Key causes include excess evapotranspiration, drought, excessive irrigation, increased toxicity, and a rising groundwater table. The 'National Bureau of Soil Survey and Land Use (1990)' has estimated that salinity results in a 25 percent loss in production across various soil qualities and crops.<sup>24</sup> Additionally, it's the fourth largest contributor to land degradation in India, leading to the deterioration of 3.48 million hectares of land.<sup>25</sup>

vi) Mass Movement

The natural process of soil and rock moving downward due to gravity is categorized as "mass movement" or "mass wasting." This includes various types of soil, overburden, or bedrock shifting downhill solely because of gravity's pull. Mass movement occurs when gravity overcomes the material's internal strength, resulting in soil, overburden, and bedrock sliding, rolling, or flowing downhill, causing significant land degradation.

vii) Man-made

Man-made desertification processes encompass all forms of land degradation directly or indirectly induced by human activities, as opposed to natural causes. These processes include mining and quarrying, which strip the land of its resources and disrupt its natural state; brick kiln operations, which consume vast amounts of soil; the discharge of industrial effluents, which pollute and degrade the land; the disposal of city waste, which contaminates and diminishes land quality; and urban agglomeration, which leads to the extensive conversion of natural landscapes into urban areas, thereby reducing the land's ecological viability.

viii) Frost Shattering

Frost shattering, a form of mechanical weathering, occurs when fluctuating temperatures near 0°C cause water to freeze within the cracks of rocks, expanding and exerting pressure on the surrounding material. This process gradually widens the cracks, leading to fragmentation and detachment of rock pieces, which accumulate as talus or scree. Common in periglacial environments, frost shattering exemplifies the continuous geological evolution driven by natural forces.

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<sup>24</sup> V. Ratna Reddy, *Land Degradation in India – Extent Costs and Determinants*, Vol. 38 Economic and Political Weekly 4700-4713 (2003) <https://www.jstor.org/stable/4414225>.

<sup>25</sup> *Id* at 11.

ix) *Frost Heaving*

Frost heaving, which happens when the weather freezes, involves ice lenses forming under the soil. The ice starts growing upwards from the freezing point in the soil, needing a steady water source for its crystals to expand. The soil above limits the ice's growth, resulting in lens-shaped ice pockets. The force from these growing ice lenses can push up soil layers by 30 cm or even more.

### III. LAND RESTORATION LAWS IN INDIA

By 2050, there's a projected 10% decline in global crop yields, mainly in India, China, and sub-Saharan Africa, underlining the urgency to tackle land degradation and advocate for restoration on a national level.<sup>26</sup> While Indian law lacks specific provisions for land restoration, statutes like the Forest Conservation Act of 1980, the National Forest Policy of 1988, and The Forest (Conservations) Rules of 2022 play significant roles in addressing this issue.

#### III.1. *Indian Laws Dealing with Land Restoration*

Article 21 of the Indian Constitution<sup>27</sup> acknowledges the right to a clean environment as part of the "*protection of life and personal liberty.*" In the case of *M.C. Mehta v. Union of India*,<sup>28</sup> the Supreme Court stated that any harm to air, water, and soil would endanger the meaning of "life" under Article 21. Additionally, Article 48-A<sup>29</sup> instructs states to preserve and enhance the environment, forests, and wildlife. Through the 42nd Amendment, Article 51-A(g)<sup>30</sup> was introduced, placing a responsibility on citizens to protect and enhance the natural environment, including forests, lakes, rivers, and wildlife, alongside the government. In *T.N. Godavarman Thirumalpad v. Union of India*,<sup>31</sup> the Court interpreted Articles 48-A and 51-A as forming the basis of environmental protection jurisprudence, emphasizing the fundamental obligation of both the state and citizens to "*safeguard and enhance the environment, including forests, lakes, rivers, wildlife, and to show compassion for living beings.*"

Section 11 of the 'Forest (Conservation) Rules, 2003' provides for the creation of compensatory afforestation in case of use of forest land.<sup>32</sup> Section 2(e) of the same Rules

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<sup>26</sup> *Id* at 1.

<sup>27</sup> INDIA CONST. art. 21.

<sup>28</sup> *M.C. Mehta v. Union of India (Shriram - Oleum Gas)*, (1987) 1 SCC 395.

<sup>29</sup> INDIA CONST. art. 48-A.

<sup>30</sup> INDIA CONST. art. 51-A(g).

<sup>31</sup> *T.N. Godavarman Thirumalpad v. Union of India*, (2002) 10 SCC 606.

<sup>32</sup> Section 11, Forest (Conservation) Rules, 2003, Rules of Ministry of Environment, Forest and Climate Change, 2003 (India).'

describes Compensatory Afforestation as “afforestation done in lieu of the diversion of forest land for non-forest purpose under the Act.”<sup>33</sup> Under Section 11, the essentials of Compensatory Afforestation are<sup>34</sup> –

- a) The user must assign land for ‘Compensatory Afforestation’ that is not classified as forest under the Indian Forest Act, 1927, or any other legislation and is not managed as forest by the Forest Department;
- b) The user is responsible for covering the expenses associated with initiating ‘Compensatory Afforestation’;
- c) If the allotted land is unsuitable for ‘Compensatory Afforestation,’ such afforestation efforts will be undertaken on degraded notified or unclassed forest land under the Forest Department’s management;
- d) The land designated for ‘Compensatory Afforestation’ will be marked by concrete pillars of appropriate dimensions;<sup>35</sup>
- e) The State Government or Union Territory Administration may establish a ‘Land Bank’ managed by the Forest Department specifically for ‘Compensatory Afforestation.’<sup>36</sup>

Section 26 of the Indian Forest Act, of 1927<sup>37</sup> provides certain activities that are prohibited in the reserved forest area like clearing land for cultivation, trespasses or pasturing cattle or kindles, keeping or carrying any fire, etc., shall be punishable with imprisonment for six months and has to pay five hundred rupees as fine along with the compensation for the damage done to the forest.

### *III.2. International Frameworks*

The UNCCD, formed in 1994, stands as the primary worldwide pact aimed at promoting sustainable land management in arid regions. India became a signatory on December 17, 1996. According to the ‘Ministry of Environment, Forest and Climate Change (MOEFCC),’ India has delivered four updates to the UNCCD in 2000, 2002, 2006, and 2010. The latest submission

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<sup>33</sup> Section 2(e), Forest (Conservation) Rules, 2003, Rules of Ministry of Environment, Forest and Climate Change, 2003 (India).

<sup>34</sup> Section 11 (1)(a), Forest (Conservation) Rules, 2003, Rules of Ministry of Environment, Forest and Climate Change, 2003 (India).

<sup>35</sup> Section 11(1)(b), Forest (Conservation) Rules, 2003, Rules of Ministry of Environment, Forest and Climate Change, 2003 (India).

<sup>36</sup> Section 11(2)(a), Forest (Conservation) Rules, 2003, Rules of Ministry of Environment, Forest and Climate Change, 2003 (India).

<sup>37</sup> Section 26, Indian Forest Act, 1927, Act 16 of 1927.’

in August 2018 delineated India's advancements in meeting the strategic framework's goals.<sup>38</sup> This report evaluates progress toward each strategic objective (SO) using various indicators. The data indicates notable trends in land cover from 2005 to 2015, including an increase in tree cover, a decrease in grassland area, and an increase in cropland area. During this period, 19,746.09 km<sup>2</sup> of land was converted from tree cover to cropland, 47,483.08 km<sup>2</sup> from grassland to cropland, and 124,000 km<sup>2</sup> from cropland to other land uses.<sup>39</sup>

The COP 21, convened in Paris in December 2015 by the ‘United Nations Framework Convention on Climate Change (UNFCCC),’ culminated in the adoption of nonbinding and voluntary objectives aimed at combating climate change. This effort involved countries publicly stating their proposed climate actions post-2020 within the framework of the new international agreement, referred to as their “Intended Nationally Determined Contributions” (INDCs). The primary objective of the INDCs is to restrict the global average temperature rise to well below 2°C, with endeavours to limit it to 1.5°C. Moreover, the objective is to attain net-zero emissions in the latter half of the century. India, as a committed signatory and participant in COP 21, ratified the convention and translated its ‘INDCs into Nationally Determined Contributions (NDCs).’ India's NDCs communicated to the UNFCCC are as follows:<sup>40</sup>

1. “To reduce the emissions intensity of its GDP by 45 percent by 2030 from the 2005 level.
2. To promote and propagate a healthy and sustainable way of living based on traditional values of conservation and moderation.
3. To adopt a climate-friendly and cleaner development path, surpassing the efforts made by other countries at a similar stage of economic development.
4. To achieve approximately 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, facilitated by technology transfer and low-cost international finance, including from the Green Climate Fund (GCF).
5. To create an additional carbon sink of 2.5 to 3 billion tons of CO<sub>2</sub> equivalent through enhanced forest and tree cover by 2030.

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<sup>38</sup> United Nations Convention to Combat Desertification, *Data and Knowledge*, (4<sup>th</sup> June, 2024), [https://prais.unccd.int/sites/default/files/pdf\\_reports/unccd\\_India\\_2018\\_2.pdf](https://prais.unccd.int/sites/default/files/pdf_reports/unccd_India_2018_2.pdf).

<sup>39</sup> *Id* at 11.

<sup>40</sup> Government of India, *India's Updated First Nationally Determined Contribution Under Paris Agreement, (2021- 20230)*, <https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>.



6. To better adapt to climate change by increasing investments in development programs for sectors vulnerable to climate change, particularly agriculture, water resources, the Himalayan region, coastal regions, health, and disaster management.

7. To mobilize domestic and new, additional funds from developed countries to implement the aforementioned mitigation and adaptation actions, considering the resources required and the existing resource gap.

8. To build capacities, create a domestic framework, and establish an international architecture for the rapid diffusion of cutting-edge climate technology in India, and to foster joint collaborative research and development for future technologies.”

India's commitments underscore its proactive approach towards combating climate change and its dedication to sustainable development.

Of the 196 countries at COP 14 of the UNCCD in 2019, 123, including India, had committed to Land Degradation Neutrality targets. Prime Minister Modi announced India's goal to restore 26 million hectares of degraded land by 2030. Apart from this, UN Sustainable Development Goal Number 15 directly deals with the “*protection, restoration, and promotion of sustainable use of terrestrial ecosystems, sustainable management of forests, combating desertification, and halting and reversing land degradation and biodiversity loss.*”<sup>41</sup>

In 2011, the ‘Bonn Challenge’ was launched by the International Union for Conservation of Nature (IUCN) in collaboration with the Government of Germany. The goal was to rehabilitate 150 million hectares (Mha) of land affected by deforestation and degradation by 2020 and increase the target to 350 Mha by 2030.<sup>42</sup> India, the first Asian nation to join, committed to restoring 26 Mha of degraded land by 2030, underscoring its dedication to environmental conservation. The United Nations has designated 2021-2030 as the “*UN Decade of Ecosystem Restoration.*” To support this initiative, the theme for World Environment Day 2024 is “*Land Restoration, Desertification, and Drought Resilience.*”<sup>43</sup> This theme underscores the critical need to restore degraded lands, combat desertification, and enhance resilience against drought, fostering a sustainable future for ecosystems and communities globally.

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<sup>41</sup> ‘United Nations Sustainable Development Goals, <https://sdgs.un.org/goals/goal15#:~:text=To%20reach%20the%20target%20of,fundamental%20human%20impact%20on%20nature>.

<sup>42</sup> National Academy of Agricultural Sciences, *Road Map for Rehabilitation of 26 Mha Degraded Lands in India*, Policy Paper No. 117, New Delhi (June 4, 2024) <https://naas.org.in/Policy%20Papers/policy%20117.pdf>.

<sup>43</sup> UN Environment Programme, <https://www.unep.org/events/un-day/world-environment-day-2024>.’

### *III.3. Policies of the Indian Government promoting land restoration*

The Government of India has consistently implemented various programs aimed at addressing land degradation and restoring natural resources. Beginning with initiatives like the ‘Drought Prone Areas Program (DPAP)’ and the ‘Desert Development Program (DDP)’ in the 1970s, followed by the establishment of the ‘National Wastelands Development Board (NWDB)’ in 1985, efforts have been made to combat land degradation across the country. The ‘Integrated Wastelands Development Program (IWDP)’ and other schemes such as soil conservation under the ‘Rashtriya Krishi Vikas Yojana (RKVY)’ have furthered this objective. Afforestation and social forestry programs, including those outlined in the ‘National Forest Policy (NFP)’ of 1988, have aimed to increase tree cover, particularly on degraded lands. Programs like the ‘Reclamation and Development of Alkali and Acid Soils (RADAS)’, the ‘National Watershed Development Program in Rainfed Areas (NWDPA)’, and the ‘Integrated Watershed Development Program (IWDP)’ have also contributed to ecological restoration efforts.

In recent years, initiatives like the ‘National Mission for Sustainable Agriculture (NMSA)’, ‘National Agroforestry Policy (NAP)’, and ‘Green India Mission (GIM)’ have been launched to address sustainable agriculture and climate change challenges. These efforts have included afforestation projects, such as those under the ‘National Bamboo Mission’, aimed at expanding bamboo cultivation. The ‘National Afforestation and Eco-Development Board (NAEB)’ has overseen projects like the ‘National Afforestation Program’ to rehabilitate and afforest degraded land. Additionally, rural employment programs like the ‘Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)’ have focused on natural resource management and community asset creation, aligning with global efforts under UN conventions on biodiversity, climate change, and desertification.

## **IV. CONCLUSION**

In conclusion, addressing the urgent need for land restoration laws in India is pivotal for rehabilitating 26 Mha of degraded lands by 2030. This goal necessitates establishing clear annual and state-wise targets, recognizing the extent of already rehabilitated lands, and accounting for newly degraded regions. Effective restoration must be guided by criteria such as the ease of rehabilitation, regional vulnerability, community benefits, cost considerations, and enhanced environmental services. Implementing holistic land-use plans that integrate afforestation with other sustainable activities, such as preventing erosion and desertification, is essential. Furthermore, collaborating with indigenous communities to revive traditional

agroforestry practices and incorporating local knowledge into modern restoration strategies can significantly enhance the efficacy of these efforts. Promoting agroforestry models will bolster biodiversity and productivity, ensuring sustainable land management. As we strive for a comfortable lifestyle, it is imperative to recognize our ecological debt and commit to actions that sustain our environment. Upholding the 'United Nations' Sustainable Development Goals' and fostering sustainable forest development are crucial steps in maintaining the ecological balance and securing our future.

# NAVIGATING DESERTIFICATION: RESTORING ECOSYSTEMS AND BUILDING DROUGHT RESILIENCE

-Aakriti Verma\*

The looming threat of desertification necessitates immediate action. While programs like social forestry and waste-land development offer a ray of hope, their effectiveness hinges on one critical factor: aligning the ecological requirements of natural processes in these programmes. Before 2015, one of the biggest policy blind spots with respect to water management on global and domestic response was considered to be desertification. Throughout this essay, the core message is that effective solutions to desertification must be both ecologically sound and socially just. Only by taking into account both ecological and social factors can we create a future in which resilient landscapes benefit all communities, and not just the privileged few.

## I. COMBATING LAND DEGRADATION: CHALLENGES AND SOLUTIONS

### *1.1 Understanding Land Degradation and Building Resilience:*

While the Earth may seem permanent, change is the defining characteristic of our planet's diverse ecosystems. One such change, which has marred the Earth's landscape to an alarming extent, is that of land degradation. It is a broader term, which refers to any deterioration in the quality of the land, whether that be in terms of its biological productivity or economic productivity.<sup>44</sup> "Desertification", a gradual process of land losing its biotic potential, is a relatively specific term within this broader category.

Various practices render land useless, many of which have been practiced for centuries, without realising the extent of damage it causes to the ecosystem. For instance, the damage caused to the soil structure due to tilling. Turning over the soil intensifies the release of Carbon Dioxide from the soil, which is the opposite of sequestering carbon.<sup>45</sup> Subsequently, the water infiltration and water holding capacity decrease as the soil structure collapses without the carbon and biology in the soil dies. Another phenomenon, dust storms, were a rarity until recent

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<sup>44</sup> Nicholas Webb, Nadine A Marshall, et. al., *Land degradation and climate change: building climate resilience in agriculture*" 15 FRONT. ECOL. ENVIRON 450, 450 (Oct. 2017) <https://www.jstor.org/stable/44989381>

<sup>45</sup> *Id.* at 452.

times. Now, they have become a seasonal occurrence. The increased frequency of dust storms in many regions further highlights the urgency of finding solutions.

Fortunately, international efforts are gradually developing to combat land degradation. The *United Nations Convention to Combat Desertification* (UNCCD) provides a global framework and has called upon nations to align their domestic policies. One of its major Sustainable Development Goals is that of *Land Degradation Neutrality* (LDN). It presumes degradation, but aims to strike a balance with the restoration efforts. The principle seeks to actively restore degraded land, which is often achieved through reforestation and sustainable land management practices. While urbanization and mining cannot be entirely prevented, the focus should be on curtailing illegal activities and fostering sustainable practices to mitigate the risks posed by land degradation. This includes halting unnecessary deforestation and restriction of mining operations within ecologically sensitive zones. LDN provides a three-tier system. It prioritizes preventing new degradation, followed by reducing, and ultimately aiming to reverse the trend altogether.<sup>46</sup>

Unlike the measures to prevent it, the causes of desertification are well understood. The overwhelming pressure on food and water resources due to the growing population, and the loosening of topsoil due to deforestation or overgrazing. Many believe sufficient rainfall to be an insurance against desertification, which is far from the truth. Even humid regions can succumb to desertification; depending on improper land use leading to declining biological productivity of the land.<sup>47</sup> This understanding paves the way for solutions. Before delving into these, it is imperative to explore the challenges associated with some proposed solutions, such as green walls, to strengthen the process of land restoration.

### *1.2 Challenges and Limitations of Large-Scale Projects:*

Made famous by the African Union, the initiative to create “*Green walls*” has been adopted by countries such as China and the US. The project requires massive investment and in Africa,

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<sup>46</sup> United Nations, *System of Environmental-Economic Accounting—Ecosystem Accounting (SEEA EA)* (White paper), UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS (Feb. 12, 2019) [https://seea.un.org/sites/seea.un.org/files/presentation\\_1\\_barron\\_orr\\_ldn\\_indicators\\_session3\\_seea\\_wcmc\\_12feb2019\\_pdf.pdf](https://seea.un.org/sites/seea.un.org/files/presentation_1_barron_orr_ldn_indicators_session3_seea_wcmc_12feb2019_pdf.pdf).

<sup>47</sup> William C. Burns, *The International Convention to Combat Desertification: Drawing a Line in the Sand?*, 16 *MICH. J. INTL. L.* 831, 832 (1995) [https://catalogue.unccd.int/357\\_Article\\_The%20International%20Convention%20to%20Combat%20Desertification%20Drawing%20a%20Line%20in%20the%20Sand.pdf](https://catalogue.unccd.int/357_Article_The%20International%20Convention%20to%20Combat%20Desertification%20Drawing%20a%20Line%20in%20the%20Sand.pdf)

well under half of the restoration target has been achieved.<sup>48</sup> It has proven to be more useful in China which is creating a belt of green cover which acts as a breaker against the dust storm from the Deserts to the North and West of the region. It breaks up the soil and renders the area useless to deterioration in the biological capacity of the soil to produce.

Inspired by these Green wall projects, India has adopted a similar project to increase the green cover in the Aravalli region and to combat the expansion of the Thar Desert. Despite commendable efforts, it is argued that this initiative will not yield the desired result without addressing the reason for its need in the first place. The illegal mining which has already cleared out numerous ranges in the region, faces further threat by the NCR Draft Regional Plan 2041.<sup>49</sup> Concerns were raised regarding the shift in the purview of the “Natural Zone” which would exclude 70 per cent of the Aravallis and other vital ecosystems, thus, exacerbating the risk that it faces.<sup>50</sup>

However, such large-scale projects have global ramifications due to their effect on the macro climate. The green wall projects often utilise “*mono-species*” of plants, which are fast-growing but due to a lack of variety, these ecosystems prove to be unsustainable. The results are not immediate and many of the projects have failed to yield the anticipated results.

### *1.3 Sustainable Land Management Practices for LDN:*

Although experts argue that increasing green cover does not always result in the desired goal depending on the soil health and climate variations. Human interference in the name of “green revolution” leads to desertification of otherwise resilient land.<sup>51</sup> It has proven to be futile in regions that experience harsh weather, making it difficult for the newly sown plants and trees to survive.

There are hundreds of millions of hectares of degraded land viable for restoration worldwide. Restoring the health of the land back eliminates the need to clear additional forest land to turn

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<sup>48</sup> R Bellefontaine, *The African Great Green Wall Project*, AGRITROP (2011) [https://agritrop.cirad.fr/567880/1/document\\_567880.pdf](https://agritrop.cirad.fr/567880/1/document_567880.pdf).

<sup>49</sup> National Capital Region Planning Board, *NCR Draft Regional Plan 2041*, NCR CAPITAL REGION PLANNING BOARD [https://www.ncrpb.nic.in/pdf\\_files/DraftRegionalPlan-2041\\_English.pdf](https://www.ncrpb.nic.in/pdf_files/DraftRegionalPlan-2041_English.pdf).

<sup>50</sup> Aravalli Bachao Campaign, *NCR Draft Plan 2041*, ARAVALLI BACHAO WORDPRESS (n.d.) <https://aravallibachao.wordpress.com/laws-protecting-aravallis/ncr-plan-2041/>.

<sup>51</sup> Subodh Pal, Uday Chatterjee, et al., *Anthropogenic drivers induced desertification under changing climate: Issues, policy interventions, and the way forward* 22 VOL. IN DIS. SCI. (2024) <https://doi.org/10.1016/j.pdisas.2023.100303>

it into cropland to keep pace with the rising demands of the population. The *Farmer Managed Natural Regeneration* (FMNR), successfully employed by many African countries, the most famous being Niger, has led to the re-greening of the Sahel region.<sup>52</sup> FMNR is lauded for its low-cost, scalable, internal management techniques, diminishing food insecurity, and promoting sustainable agriculture. Consequences of this, in the form of economic and social benefits, are derived by the rural farming communities.

In contrast, quick alternatives that use harmful chemicals have proven ecologically destructive in the long run. All FMNR requires is better management techniques, coppicing and pollarding, drawing on traditional practices and adapting to local variation,<sup>53</sup> which combat extreme deforestation and desertification in the region.

Another such popular practice was theorized by *Allen Savory* in his *Holistic Management Theory*. His theory reversed the popularized belief that heavy grazing patterns of livestock lead to desertification. Instead, he propagated his idea of accelerating plant succession, by utilizing tightly packed cattle, mimicking the traditional feeding and herding pattern.<sup>54</sup> These herds grazed, defecated, stomped, and salivated as they moved, forming soil and deepening plant roots. Wild herds, gradually, were replaced by small numbers of domestic and sedentary livestock, and pack-hunting predator populations were largely eradicated. Without the constant activity of large numbers of bunched animals, the biological cycle was disrupted, and the grasslands and their once-rich soils transformed into dry, exposed deserts.

Other methods include *Assisted natural regeneration* (ANR) and the practice of *Agroecology*. ANR is a low-cost and effective technique for catalysing the natural regrowth of vegetation on degraded land. It differs from traditional reforestation efforts in that it focuses on protecting and nurturing existing trees and shrubs rather than planting new ones. Pruning and controlling invasive species help existing plants thrive and spread their coverage. As plant cover increases,

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<sup>52</sup> TWorld Vision Ethiopia, *FMNR Made Visible Difference During the 2015 Drought in Ethiopia*, WORLD VISION INTERNATIONAL (May, 2020) <https://www.worldvision.org/wp-content/uploads/FMNR-case-story-in-fightingdrought.pdf>.

<sup>53</sup> UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, DIVISION FOR SUSTAINABLE DEVELOPMENT, FARMER MANAGED NATURAL REGENERATION (FMNR): A TECHNIQUE TO EFFECTIVELY COMBAT POVERTY AND HUNGER THROUGH LAND AND VEGETATION RESTORATION (June, 2022) <https://sustainabledevelopment.un.org/partnership/?p=30735>.

<sup>54</sup> Savory Institute, *What Is Holistic Management*, SAVORY INSTITUTE (Jan. 19, 2020) <https://savory.global/what-is-holistic-management/#:~:text=Forty%20years%20ago%2C%20Allan%20Savory,the%20people%20living%20on%20the>

the microclimate also improves through this method. This attracts more wildlife and promotes a healthier environment in which all plants can thrive.

Agroecology, on the other hand, mimics nature's sustainable practices. This holistic approach to agriculture incorporates ecological principles directly into farming practices. It encourages crop diversification and a more diverse ecosystem, which was the drawback of green walls. It entails practices such as cover cropping, composting and reduced tillage. By promoting nutrient cycling, this method reduces the need for external inputs to promote soil health.

## II. IMPACTS ON MARGINALIZED COMMUNITIES AND WOMEN

### *2.1 Socioeconomic Challenges Faced by Marginalised Communities:*

Climate change has a disproportionate impact on marginalized communities, particularly those residing in developing and least-developed countries. This creates a vicious cycle. As land degradation accelerates due to climate pressures, these communities face increased food insecurity.<sup>55</sup> This forces them to exploit the land even further for immediate survival, compromising the soil's fertility. This vulnerability stems from a lack of resources and knowledge. Limited access to finances hinders investment in sustainable land management practices and soil conservation techniques. Additionally, a technology and knowledge gap impedes their capacity to adapt to changing environmental conditions.

Vast tracts of land, at least one-quarter of the total land are managed by the Indigenous People.<sup>56</sup> They get minimal support from the State despite their success in fighting desertification through traditional methods. Recognizing their land rights allows them to protect healthy land and restore degraded areas. Their knowledge, passed down through the generations, is critical to halting desertification and restoring ecosystems. Incorporating this knowledge is crucial for a sustainable future.

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<sup>55</sup> David R. Boyd & Imalka Nimalgod, *The Overlooked Environmental and Human Rights Crisis: Desertification, Land Degradation and Drought, Executive Summary*, U.N. SPECIAL RAPPORTEUR ON HUMAN RIGHTS AND THE ENVIRONMENT (June, 2023) <https://www.ohchr.org/sites/default/files/documents/issues/environment/srenvironment/SR-Environment-PolicyBrief-4-executive-summary.pdf>.

<sup>56</sup> IPBES SECRETARIAT, *Summary for Policymakers of the global assessment report on biodiversity and ecosystem services* (May 6, 2019) [https://files.ipbes.net/ipbes-web-prod-public-files/downloads/spm\\_unedited\\_advance\\_for\\_posting\\_htn.pdf](https://files.ipbes.net/ipbes-web-prod-public-files/downloads/spm_unedited_advance_for_posting_htn.pdf).



The conversion of temporary meteorological drought into a long-term ecological process of desertification due to ecologically destructive development programmes has serious political and economic ramifications since it hits the poor and the marginal population for reasons originating in the interest of the rich sections of the rural communities. The consequences of this cycle are far-reaching. Land degradation fuels migration as people seek more sustainable livelihoods elsewhere. This trend is projected to worsen in the coming decades. However, migration itself can exacerbate the problem. Displaced populations often bring new land under cultivation, increasing pressure on already fragile ecosystems.<sup>57</sup> Exploring further on this subject necessitates the disproportionate effect that these challenges have on women, and how ecofeminism offers a unique perspective on this issue.

### *2.2 Gender Perspective and Eco-Feminism:*

Women in developing and least-developed countries are primarily responsible for small-scale farming and household food production. Desertification directly threatens this livelihood and food security. Environmental stress and migration expose women and girls to *Gender-Based Violence*.

The term “*eco-feminism*” initially appears as somewhat misplaced and incongruous in its pairing of feminist ideals and ecological concerns. This stems from the belief that the relationship that patriarchy shares with women is analogous to its relationship with the environment. Eco-feminism draws from the subjugation of women in terms of political and economic power within the feminist movement. It suggests that just as men have traditionally dominated women, they now consider it to be their right to scrupulously take from the environment without any limitations. This stands in contrast to the traits of cooperation and nurturing, closer to “maternal” qualities as described in feminist theories.<sup>58</sup> It discourages the oppressive/commanding/controlling mindset associated with patriarchal systems which does not bother with the needs and desires of any other.

Differences in land rights, holding, and benefit sharing highlight a pervasive mindset that excludes marginalized groups, particularly women. Despite being the backbone of subsistence

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<sup>57</sup> Marion Borderon et al., *Migration Influenced by Environmental Change in Africa: A Systematic Review of Empirical Evidence*, 41 DEMOGR. RES. 491, 502 (2019) <https://www.jstor.org/stable/26850658>.

<sup>58</sup> Lliane Loots, *Revisiting Gender Ecology and Eco-Feminism: A Profile of Five Contemporary Women Water Activists*, 25 AGENDA EMPOWER WOMEN 1, 6 (2011) <https://www.jstor.org/stable/41321411>.

agriculture and facing the harshest consequences of land degradation, women are often excluded from decision-making processes regarding land management. As evidenced by the work of activists like *Asaha Elizabeth Ufei*, this marginalization is a painful reality for many rural women in Africa. Similar struggles extend to water access. *Maude Barlow's* fight for the recognition of water or 'Blue Gold' as a human right, underscores the dangers of corporate control over essential resources, often male-owned, which can further disadvantage women. Similar to Barlow's fight, *Vandana Shiva's* work with poor women farmers in India echoes this concern, highlighting the miles women travel for water, putting them at risk in isolated areas, and arguing for community control over water resources. These examples illustrate how unequal land rights, gender exclusion, and corporate control over resources are interconnected issues that disproportionately burden women. Addressing the gender-specific impacts of desertification requires robust policy and institutional support, highlighting the need for comprehensive strategies that include the voices of marginalized communities.

### *2.3 Policy and Institutional Support:*

Policies are bound to prove hollow in case the differences highlighted are not taken into consideration during their formulation. International forums like UNCCD and the Green Climate Fund (GCF) have harnessed these issues in their action planning and have provided countries with a suggestive roadmap to incorporate gender concerns into mainstream policies to refine LDN targets at an individual level. The UNCCD pointed out a vacuum in the economic costs linked with land degradation and desertification, but it firmly believes that the private sector needs to be involved in the pursuit of sustainable land management, as it is also driven by market failure.<sup>59</sup>

Effective strategies necessitate empowering marginalized groups, which are frequently disproportionately affected by land degradation. This includes prioritizing women's land rights and eliminating discriminatory practices that restrict their access to resources. Further, women-led organizations should be strengthened to ensure their voices are heard in the decision-making processes. Their involvement should be promoted at national and local levels in environmental governance systems.

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<sup>59</sup> Luc Gnacadja, *Land Degradation: The Hidden Face of Water Scarcity*, 35 HARV. INT'L REV. 50, 53 (2013). <https://www.jstor.org/stable/42763577>

Additionally, promoting equitable benefit-sharing mechanisms is critical to the participation of Indigenous people in land restoration projects. Providing access to legal information and respecting cultural practices can help these communities become effective partners in combating desertification. Furthermore, as environmental degradation forces many to migrate, effective migration policies must protect these displaced individuals. The Global Compact for Migration encourages countries to collaborate and develop solutions, such as planned relocation options, for those who are unable to return home due to environmental degradation. More humanitarian assistance is needed for both migrants and refugees.

## **CONCLUSION**

When addressing the multifaceted challenges brought forth by desertification, it is sufficient to say that conventional measures are not reliable. The goal should be to diminish the pressure on degraded lands by changing public perception and behaviours towards land management and conservation. In this sense, the development of public-private partnerships can prove crucial for resource mobilization and driving large-scale sustainable projects. The whole process would benefit more by incorporating modern science with traditional knowledge and increasing communal involvement to develop resilient agricultural practices tailored according to the needs of local ecosystems. This essay reinforces the belief that desertification is not only an environmental issue but also a human one.