BRICS
INDIA 2026

BUILDING FOR RESILIENCE, INNOVATION, COOPERATION AND SUSTAINABILITY

COMPENDIUM ON INTEGRATED LANDSCAPE-BASED GREENING APPROACHES





Disclaimer: This publication has been prepared as a knowledge-sharing resource under the BRICS Environment Working Group during India's BRICS 2026 Chairship, with voluntary contributions from the BRICS Member Countries.

The views, findings, and conclusions reflected herein are based on the select case studies and leading practices shared by BRICS Member Countries and may not necessarily represent the overall position of BRICS Member Countries or the BRICS Environment Working Group, nor should they be construed as endorsement or recommendation of any specific approach.

This publication is not a policy, legal, or negotiated document, and is a collation of experiences, case studies and practices that may be context specific. While every effort has been made to ensure the accuracy and completeness of the information presented, India's BRICS 2026 Chairship assumes no responsibility for any errors, omissions, or consequences arising from the use or interpretation of its contents.

Copyright © Ministry of Environment, Forest and Climate Change, 2026

MoEFCC (2026), Compendium on Integrated Landscape-Based Greening Approaches, New Delhi, India. 1st Edition. (96 pp.)

BRICS
INDIA 2026

BUILDING FOR RESILIENCE, INNOVATION, COOPERATION AND SUSTAINABILITY

COMPENDIUM ON INTEGRATED LANDSCAPE-BASED GREENING APPROACHES

2026

Ministry of Environment, Forest and Climate Change
Government of India



ACKNOWLEDGEMENT

This publication reflects the constructive dialogue, mutual learning, and spirit of voluntary cooperation fostered through the BRICS Environment Working Group. The exchanges and deliberations under the EWG have contributed to a shared understanding of how integrated landscape-based greening approaches may be adopted across varied ecosystems and national contexts to advance multidimensional benefits.

The preparation of the BRICS Compendium on Integrated Landscape-Based Greening Approaches has been made possible through the valued expertise, sustained engagement, and thoughtful contributions of BRICS Member Countries. Their support has been instrumental in advancing the shared objectives of the BRICS partnership and in strengthening the basis for sustained cooperation towards a future that safeguards the well-being of people and planet.

The Chair conveys its sincere appreciation to all those who have contributed to the preparation and finalisation of this Compendium. The valuable efforts of the respective national focal points, technical experts, government institutions, and stakeholder organisations, whose perspectives and inputs have enriched this document, are acknowledged with gratitude.



TABLE OF CONTENTS

TABLE OF CONTENTS

Contents	Page
Acronyms	**i**
Executive Summary	**iii**
Chapter 1. Introduction	**1**
1.1 Background	2
1.2 Why Integrated Landscape-Based Greening Approaches?	3
1.3 Objectives of the Compendium	5
Chapter 2. BRICS Landscape Context	**7**
2.1 Overview of BRICS Landscapes	8
2.2 Major Ecosystems Across BRICS	9
2.3 Common Drivers of Landscape Degradation	12
2.4 Restoration Opportunities Across BRICS	12
Chapter 3. Integrated Landscape-Based Greening: A Framework for Action	**15**
3.1 Introduction	16
3.2 Core Components of Integrated Landscape-Based Greening	18
3.3 Enabling Conditions for Implementation	20
Chapter 4. Country Best Practices	**21**
4.1 Introduction	22
4.2. Brazil	23
4.3. China	27
4.4. Egypt	31
4.5. Ethiopia	35
4.6. India	39
4.7. Indonesia	46
4.8. Russia	50
4.9. United Arab Emirates	53
Chapter 5. Cross-Cutting Analysis and Synthesis	**57**
5.1 Common Enabling Factors	58
5.2 Persistent Challenges	61
5.3 Innovations and Emerging Approaches	63
5.4 Gender and Social Inclusion	66

Contents Page

Chapter 6. Suggested Pathways for a Restorative and Integrated Landscape.....69
6.1 Capacity Building.....70
6.2 Monitoring Frameworks.....70
6.3 Restoration Finance.....71
6.4 Research and Innovation.....71

Chapter 7. Conclusion.....73

References.....75

LIST OF TABLES

Table 1. Major Global Restoration Commitments.....3
Table 2. Ecological and Land-use Profile of BRICS Countries (Approximate Values).....9
Table 3. Brazil at a Glance.....23
Table 4. China at a Glance.....27
Table 5. Egypt at a Glance.....31
Table 6. Ethiopia at a Glance.....35
Table 7. India at a Glance.....40
Table 8. Indonesia at a Glance.....46
Table 9. Russia at a Glance.....50
Table 10. The United Arab Emirates at a Glance.....53

LIST OF FIGURES

Figure 1. Major Ecosystems Represented Across BRICS Countries.....11
Figure 2. The BRICS Ecological Mosaic.....14
Figure 3. An Integrated Landscape-Based Greening Approach for Sustainable Landscape Restoration across BRICS Countries.....17

ACRONYMS

ACRONYMS	
CAMPA	Compensatory Afforestation Fund Management and Planning Authority (India)
CBD	Convention on Biological Diversity
CEMADEN	National Centre for Monitoring and Early Warning of Natural Disasters (Brazil) / Centro Nacional de Monitoramento e Alertas de Desastres Naturais
CNCD	National Commission to Combat Desertification (Brazil) / Comissão Nacional de Combate à Desertificação
DLDD	Desertification, Land Degradation and Drought
EWG	Environment Working Group
FAO	Food and Agriculture Organization of the United Nations
FLR	Forest Landscape Restoration
GIS	Geographic Information Systems
GRP	Global Resilience Partnership
INSA	National Institute of the Semi-Arid Region (Brazil) / Instituto Nacional do Semiárido
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
LDN	Land Degradation Neutrality
MAC	Mangrove Alliance for Climate
MISHTI	Mangrove Initiative for Shoreline Habitats and Tangible Incomes (India)
MoEFCC	Ministry of Environment, Forest and Climate Change (India)
PLANAVEG	National Plan for the Recovery of Native Vegetation (Brazil) / Plano Nacional de Recuperação da Vegetação Nativa
NbS	Nature-based Solutions
NDC	Nationally Determined Contribution
NFGA	National Forestry and Grassland Administration (China)
OECD	Organisation for Economic Co-operation and Development
PAB-Brasil	National Action Programme to Combat Desertification and Mitigate the Effects of Drought (Brazil) / Plano de Ação Brasileiro de Combate à Desertificação e Mitigação dos Efeitos da Seca

ACRONYMS	
PLA	Polylactic Acid
PPP	Purchasing Power Parity
SDGs	Sustainable Development Goals
SLM	Sustainable Land Management
UKCEH	UK Centre for Ecology & Hydrology
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VB-G RAM G	Viksit Bharat – Guarantee for Rozgar and Ajeevika Mission (Gramin) (India)

BRICS
INDIA 2026

EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

Healthy landscapes underpin sustainable development by providing food, water, biodiversity, climate regulation and livelihoods for billions of people. Yet, land degradation, desertification, biodiversity loss and climate change are placing unprecedented pressure on ecosystems worldwide. According to the United Nations Convention to Combat Desertification (UNCCD), up to 40 per cent of the world's land is degraded, affecting more than 3.2 billion people and reducing the capacity of ecosystems to sustain human well-being. These challenges are closely interconnected and cannot be effectively addressed through fragmented sectoral interventions.

Within this global context, BRICS countries hold a uniquely important position. Together, the BRICS membership represents nearly half of the world's population, over one-third of the global land area, and encompasses some of the planet's most ecologically significant landscapes, including tropical and boreal forests, drylands, grasslands, wetlands, mangroves, peatlands, mountain ecosystems and productive agricultural landscapes. These ecosystems support globally important biodiversity, carbon stocks, freshwater resources and rural livelihoods. At the same time, BRICS countries face common environmental challenges, including land degradation, desertification, water scarcity, biodiversity loss and increasing climate risks. These shared challenges also create significant opportunities for cooperation, innovation and collective leadership.

The Compendium on Integrated Landscape-Based Greening Approaches has been prepared to support this cooperation by documenting practical experiences, innovative approaches and policy lessons from across BRICS countries. The Compendium promotes integrated landscape based greening approaches, rather than treating restoration as a collection of isolated activities. It shows how this approach can restore ecosystems, strengthen climate resilience, conserve biodiversity, and support sustainable livelihoods. The experiences presented in this Compendium illustrate that successful landscape restoration involves much more than planting trees or rehabilitating degraded land. Across different ecological and socio-economic contexts, countries are adopting landscape-scale approaches that integrate ecological restoration with agriculture, forestry, water resource management, disaster risk reduction, biodiversity conservation and rural development. Successful restoration requires coordinated governance, science-based planning, sustained financing, community participation and adaptive management.

The country experiences presented in this Compendium reflect the diversity of restoration approaches adopted across BRICS Member Countries. While these initiatives respond to different environmental conditions, several common patterns emerge. Strong political commitment across BRICS countries consistently provides the

foundation for long-term restoration programmes. Further, integrated governance mechanisms improve coordination across sectors and institutions. Additionally, restoration is increasingly planned at landscape or watershed scales rather than administrative boundaries. NbS, climate-smart agriculture, sustainable land management and ecosystem restoration are increasingly implemented together to generate multiple environmental, social and economic benefits. These interventions are bolstered by community participation, which recognises local communities as partners in restoration. Lastly, scientific evidence, geospatial technologies, remote sensing and digital monitoring systems are becoming indispensable tools for planning, monitoring and adaptive management, improving outcomes significantly.

Drawing upon these shared experiences, several priorities for strengthened BRICS cooperation emerge. These include (i) expanding knowledge exchange on successful restoration models; (ii) strengthening capacity building and technical cooperation; (iii) promoting harmonized monitoring frameworks based on geospatial technologies and Land Degradation Neutrality (LDN) indicators; (iv) fostering collaborative research on ecosystem restoration, climate resilience, biodiversity conservation and emerging restoration technologies; and (v) enhancing South-South cooperation to accelerate the adaptation and replication of successful approaches across diverse ecological and socio-economic contexts.

As BRICS continues to expand its role in global environmental governance, the collective experience of Member Countries provides valuable evidence that restoring landscapes is both an environmental necessity and a strategic investment in economic resilience, human well-being and sustainable development. By strengthening cooperation, sharing innovations and scaling integrated landscape-based greening approaches, Member Countries are well positioned to make a significant contribution towards achieving global restoration ambitions while advancing a more resilient, inclusive and sustainable future for people and planet.



CHAPTER 1
INTRODUCTION



CHAPTER 1

INTRODUCTION

1.1 Background

Healthy landscapes are fundamental to sustainable development, providing food, water, biodiversity, climate regulation and livelihoods for billions of people. However, unsustainable land use, biodiversity loss and climate change are placing growing pressure on ecosystems worldwide. According to the UNCCD, up to 40% of the world's land is degraded, affecting more than 3.2 billion people and causing annual economic losses of about USD 878 billion (UNCCD, 2025; UNCCD, 2022). At the same time, nearly one million species are at risk of extinction, while climate change is increasing the frequency and intensity of droughts, floods, wildfires and other extreme events (IPBES, 2019; IPCC, 2023).

These challenges are closely interconnected. Land degradation reduces biodiversity and ecosystem resilience. Climate change further accelerates ecosystem degradation and loss of ecosystem services. Addressing these issues in isolation is therefore unlikely to deliver lasting outcomes. Instead, integrated approaches that consider ecological, social and economic dimensions together are increasingly recognised as essential for restoring ecosystem functions and supporting sustainable development (UNCCD, 2022).

Recognising this, the international community has adopted several complementary frameworks that place ecosystem restoration at the centre of sustainable development. These include the UNCCD's Land Degradation Neutrality (LDN) framework (2017); the Bonn Challenge (2011); the Kunming-Montreal Global Biodiversity Framework (2022); the Paris Agreement (2015) and the United Nations Decade on Ecosystem Restoration (2021-2030). Together, these initiatives encourage countries to restore degraded landscapes, conserve biodiversity and strengthen climate resilience through integrated and nature-based approaches (CBD, 2024; UNFCCC, 2017; UNEP & FAO, 2021). These integrated landscape-based greening approaches have emerged as an effective method to balance conservation, sustainable production and socio-economic development.

Table 1. Major Global Restoration Commitments

Global Framework	Key Restoration Objective
UNCCD – Land Degradation Neutrality (LDN)	Avoid, reduce and reverse land degradation by 2030
Bonn Challenge	Restore 350 million ha of degraded and deforested landscapes by 2030
Kunming–Montreal Global Biodiversity Framework	Restore at least 30% of degraded ecosystems by 2030
Paris Agreement	Promote ecosystem-based climate mitigation and adaptation
UN Decade on Ecosystem Restoration (2021–2030)	Prevent, halt and reverse ecosystem degradation

(Source: UNCCD, CBD, UNEP and FAO)

1.2 Why Integrated Landscape-Based Greening Approaches?

Landscapes are interconnected systems in which forests, agricultural lands, grasslands, wetlands, rivers and human settlements interact to provide food, water, biodiversity and other ecosystem services. Decisions in one part of a landscape often influence ecological processes and livelihoods elsewhere. Managing these resources separately can create conflicts among conservation, production and development objectives. Integrated landscape-based greening addresses these challenges by promoting coordinated planning and management across entire landscapes (UNCCD, 2022; Sayer et al., 2013). Unlike sector-based approaches, integrated landscape approaches recognise the links between ecosystems, communities and economic activities. They encourage collaboration among governments, local communities, researchers, the private sector and other stakeholders to restore and maintain ecosystem functions, improve the sustainable use of land and natural resources, strengthen livelihoods and food security, enhance climate resilience and reduce trade-offs among competing land-use objectives. By coordinating actions across different land uses and stakeholders, such approaches can help maximise synergies, minimise conflicts and deliver multiple environmental, social and economic benefits at the landscape scale. (Sayer et al., 2013).

Box 1.2. Why BRICS Matters for Global Ecosystem Restoration

BRICS countries possess some of the world's most important ecological assets and have a critical role to play in global efforts to combat land degradation, biodiversity loss and climate change. Collectively, the eleven countries contain a substantial share of global forests, agricultural lands, drylands and wetlands and encompass almost all major terrestrial ecosystems (FAO, 2025; Keith et al., 2020). These landscapes support globally important carbon sinks and include several biodiversity hotspots such as Amazonia, the Atlantic Forest, the Western Ghats, Eastern Himalaya, Sundaland, the Cape Floristic Region and the Eastern Afromontane region (CBD, 2024).

The economies and livelihoods of hundreds of millions of people in BRICS countries depend directly on ecosystem services provided by forests, grasslands, agricultural landscapes, wetlands and coastal ecosystems (World Bank, 2024). However, these landscapes are increasingly threatened by land degradation, biodiversity loss and climate change, highlighting the need for integrated approaches to conservation and restoration (UNCCD, 2022; IPBES, 2019).

Many BRICS countries have established ambitious restoration and climate commitments through LDN targets, Nationally Determined Contributions (NDCs) and National Biodiversity Strategies and Action Plans (NBSAPs). Programmes related to forest landscape restoration, sustainable land management, agroforestry, watershed restoration and NbS demonstrate the potential to generate multiple benefits for climate resilience, biodiversity conservation and sustainable development.

The ecological diversity, restoration potential and growing technical capacities of BRICS countries provide a strong foundation for knowledge exchange, innovation and South-South cooperation. By scaling integrated landscape-based greening approaches, BRICS countries can make a significant contribution to achieving the Sustainable Development Goals, the Kunming-Montreal Global Biodiversity Framework and the objectives of the Paris Agreement and the UNCCD

1.3 Objectives of the Compendium

Over the past two decades, BRICS Member Countries have implemented a wide range of restoration and sustainable land management initiatives. These experiences provide valuable opportunities for sharing knowledge, technologies and good practices through South-South cooperation. By strengthening collaboration on integrated landscape-based greening, BRICS Member Countries can accelerate progress towards LDN, biodiversity conservation, climate resilience and the Sustainable Development Goals (SDGs), while also contributing to global environmental commitments.

This Compendium on Integrated Landscape-Based Greening Approaches contributes to knowledge exchange, policy dialogue and cooperation among BRICS Member Countries, bringing together scientific evidence, policy perspectives and practical experiences to promote ecosystem restoration and sustainable landscape management through integrated landscape-based approaches.

The Compendium aims to:

- Showcase policies, programmes and good practices from BRICS countries.
- Highlight enabling conditions, including governance, finance, science, technology and community participation.
- Promote South-South cooperation, knowledge sharing and capacity development among BRICS Member Countries.
- Support implementation of global commitments related to Land Degradation Neutrality, biodiversity conservation, climate resilience and sustainable development.



CHAPTER 2
BRICS LANDSCAPE CONTEXT



2 CHAPTER

BRICS LANDSCAPE CONTEXT

2.1 Overview of BRICS Landscapes

The landscapes of the BRICS countries are of exceptional global significance. Together, the eleven Member Countries encompass a substantial share of the world's land area and contain extensive forests, agricultural lands, drylands and biodiversity-rich ecosystems that support food security, livelihoods and environmental sustainability (FAO, 2024; FAO, 2025; UNCCD, 2022). They include some of the world's most important carbon sinks and biodiversity hotspots and provide ecosystem services that are essential for climate regulation, biodiversity conservation and economic development.

BRICS countries play a major role in global food and forest resources. A significant proportion of the world's agricultural land and forest area is located within these countries, particularly in Brazil, Russia, China, India and Indonesia (FAO, 2024; FAO, 2025). Their landscapes encompass a wide range of ecosystems, including tropical and boreal forests, grasslands, drylands, mountain ecosystems, wetlands, peatlands and coastal systems, representing almost all major terrestrial biomes (Keith et al., 2020).

The biodiversity importance of BRICS landscapes is equally remarkable. Several globally recognised biodiversity hotspots occur within BRICS countries, including Amazonia, the Atlantic Forest, the Western Ghats, Eastern Himalaya, Sundaland, the Cape Floristic Region and the Eastern Afromontane region (CBD, 2024). At the same time, large rural populations continue to depend directly on land-based resources for food, income and livelihoods (World Bank, 2024). However, increasing pressures from land degradation, biodiversity loss and climate change threaten the long-term sustainability of these ecosystems (UNCCD, 2022; IPBES, 2019).

Table 2. Ecological and Land-use Profile of BRICS Countries (Approximate Values)

S. No	Country	Land Area (1000 km²)	Forest Area (%)	Agricultural Land (%)	Rural Population (%)
1	Brazil	8,500	59	33	12
2	China	9,300	23	55	35
3	Egypt	1,000	0.1	4	57
4	Ethiopia	1,100	12	80	77
5	India	3,000	24	60	64
6	Indonesia	1,900	51	30	44
7	Iran	1,600	6	30	24
8	Russia	16,400	49	13	25
9	South Africa	1,200	7	80	33
10	Saudi Arabia	2,150	0.5	80	17
11	United Arab Emirates	84	3	5	13

(Source: World Bank, 2025)

2.2 Major Ecosystems Across BRICS

The BRICS countries together form a diverse ecological mosaic that includes almost all major terrestrial and coastal ecosystems found across the world (Keith et al., 2020). These ecosystems support biodiversity, regulate climate and water cycles, and provide essential resources and livelihoods for millions of people. Despite their diversity, they face common pressures from land-use change, unsustainable resource use and climate change, highlighting the need for integrated landscape approaches (IPBES, 2019; UNCCD, 2022). Forests represent one of the most important ecological assets of BRICS countries. Tropical, temperate and boreal forests in Brazil, Russia, India, China and Indonesia contain large carbon stocks, regulate hydrological processes and support rich biodiversity (FAO, 2025). However, fragmentation, wildfires and climate-related disturbances threaten their ecological integrity. Forest landscape restoration and assisted natural regeneration offer important opportunities for restoring these ecosystems (FAO, 2022).

Drylands and grasslands are widely distributed across India, South Africa, Ethiopia, Iran, Saudi Arabia and Egypt. These ecosystems support livestock production, provide soil carbon storage and contribute to food security and climate resilience (UNCCD, 2022). However, overgrazing, unsustainable land use and increasing droughts have accelerated degradation and desertification. Sustainable land management and

rangeland restoration are important pathways for improving productivity and resilience (Global Center on Adaptation, 2021). Mountain ecosystems in countries such as India, China, Ethiopia and Iran function as important water towers and biodiversity refugia (IPBES, 2019). These fragile landscapes are increasingly threatened by climate change, land-use change and infrastructure development. Integrated watershed management and ecosystem-based adaptation can help maintain their ecological functions (UNCCD, 2022). Wetlands, peatlands and coastal ecosystems are particularly important in Brazil, Russia, India and Indonesia. These ecosystems provide flood regulation, water purification, fisheries and significant carbon storage, especially in mangroves and peatlands (Keith et al., 2020). However, drainage, pollution and sea-level rise continue to threaten their health. Restoration of wetlands, peatlands and mangroves offers important opportunities for enhancing biodiversity and climate resilience (IUCN, 2017; UKCEH, 2021).

Agricultural landscapes occupy a large proportion of BRICS territories and are central to food security and rural livelihoods (FAO, 2024). However, unsustainable intensification, soil erosion and declining soil fertility threaten their long-term productivity (IPBES, 2019). Sustainable agriculture, agroforestry and improved soil and water management can help restore ecosystem functions while supporting livelihoods. Together, these ecosystems form the BRICS Ecological Mosaic and provide critical ecosystem services at local, regional and global scales. Maintaining their health and resilience requires integrated approaches that balance conservation, restoration and sustainable development objectives.



H Overlap with global biodiversity hotspot C Important global carbon store / sink – Not a significant extent

Major ecosystem type (indicative)	Brazil	Russia	India	China	South Africa	Egypt	Ethiopia	Iran	Saudi Arabia	UAE	Indonesia
Tropical–subtropical moist forests (incl. tropical rainforest)	Amazon, Atlantic Forest, Cerrado fringes C H	–	Eastern Himalaya, Western Ghats H	Southern subtropical forests C	–	–	Eastern Afromontane highlands H	–	–	–	Sundaland, Wallacea; peat swamp forests C H
Temperate–boreal forests & woodlands	–	Boreal forests, major global carbon store C	–	Temperate mixed forests	–	–	–	Montane and temperate woodlands	–	–	–
Savannas and tropical grasslands	Cerrado, Caatinga mosaics	Steppe–forest ecotones	Deccan, dry tropical savannas	Dry grasslands, steppe	Savannas, Succulent Karoo, Maputaland Pondoland Albany H	–	East African savannas, Eastern Afromontane H	Irano Anatolian steppe	Arid savanna/ steppe mosaics	–	Savanna and grassland mosaics
Deserts and semi deserts	Caatinga, semi arid NE	Eurasian semi deserts	Thar and cold deserts in Himalaya	North west deserts, Loess Plateau margins	Kalahari, Karoo	Sahara, Eastern desert	Horn of Africa drylands	Irano Anatolian and adjacent drylands H	Arabian Desert	Hyper arid deserts and gravel plains	Nusa Tenggara drylands, seasonal savannas
Montane systems (alpine / highlands)	Andean like highlands in south/southeast	Ural, Caucasus, Siberian ranges	Himalaya, Western Ghats uplands H	Mountains of Southwest China, Tibetan Plateau margins H	Drakensberg and associated highlands H	–	Ethiopian highlands, Eastern Afromontane H	Zagros, Alborz mountain systems	Asir and Hijaz ranges	–	Montane forests of Papua region, Wallacea
Wetlands (rivers, lakes, floodplains, peatlands)	Pantanal, Amazon floodplains C	Extensive wetlands, peatlands in west Siberia C	Ganges–Brahmaputra floodplains, inland wetlands	Yangtze, Yellow River wetlands, peatlands in NE	Highveld wetlands, estuaries	Nile floodplain and delta wetlands	Rift Valley lakes, highland wetlands	Inland wetlands, seasonal lakes	Oases, sabkha, and ephemeral wetlands	Sabkha, wadis, artificial wetlands	Peat swamp forests, large lake and river systems C
Coastal systems & mangroves	Amazon and Atlantic mangroves C	Limited Arctic/ temperate coasts; no major mangroves	East and west coast mangroves	South China Sea coasts, limited mangroves	Temperate coasts, estuaries	Mediterranean and Red Sea coasts, limited mangroves	Red Sea and Gulf of Aden coasts, limited mangroves	Persian Gulf and Caspian coasts	Red Sea and Arabian Gulf coasts; some mangroves	Arabian Gulf and Gulf of Oman coasts; planted/ restored mangroves	World significant mangroves in Sundaland, extensive coral reef coasts C
Intensive cropland / agro ecosystems	Soy, maize, sugarcane belts; extensive pasture	Grain belts, steppe agriculture	High proportion arable and irrigated land	Large grain, rice and horticulture regions	Mixed rainfed and irrigated cropping	Intensive irrigated agriculture along the Nile and reclaimed deserts	Rainfed and irrigated highland agriculture	Irrigated and rainfed agriculture in basins and plateaus	Oases, irrigated pivot systems	Limited, highly irrigated systems	Rice, palm oil, mixed tree crop systems

Figure 1. Major Ecosystems Represented Across BRICS Countries (Source: FAO, 2025; UNCCD, 2022; IPBES, 2023; IPCC, 2022)

2.3 Common Drivers of Landscape Degradation

Despite their ecological diversity, landscapes across BRICS countries face several common drivers of degradation. Assessments by UNCCD, IPBES and IPCC show that unsustainable land use and land-use change remain the main causes of ecosystem degradation, biodiversity loss and declining ecosystem services (UNCCD, 2022; IPBES, 2019; IPCC, 2022). Agricultural expansion and unsustainable management practices, including overgrazing, excessive tillage and unsustainable irrigation, have resulted in soil erosion, loss of soil fertility and declining productivity (UNCCD, 2022). Deforestation and vegetation loss caused by agricultural expansion, infrastructure development and unsustainable extraction have reduced carbon stocks and fragmented habitats (FAO, 2025; IPBES, 2019).

Rapid urbanisation, industrialisation and infrastructure development have further altered natural landscapes and reduced ecological connectivity. Mining activities have contributed to vegetation loss, soil disturbance and pollution, particularly in forest and mountain regions (UNCCD, 2023). In addition, climate change and extreme events such as droughts, floods, heatwaves and wildfires are increasing the vulnerability of ecosystems and accelerating degradation processes (IPCC, 2022). These drivers often interact and reinforce one another. For example, deforestation and soil degradation reduce ecosystem resilience, while climate change intensifies their impacts. Addressing these interconnected challenges requires integrated landscape approaches that balance production, conservation and restoration objectives and promote sustainable and resilient land-use systems.

2.4 Restoration Opportunities Across BRICS

The diversity of landscapes across BRICS Member Countries offers significant opportunities for ecosystem restoration and sustainable land management. The United Nations Decade on Ecosystem Restoration (2021-2030) highlights the importance of preventing, halting and reversing ecosystem degradation through integrated approaches that deliver environmental, social and economic benefits (UNEP & FAO, 2021). Across BRICS Member Countries, restoration pathways such as forest landscape restoration, sustainable land management, agroforestry, watershed restoration and NbS are increasingly being promoted to address land degradation, biodiversity loss and climate change.

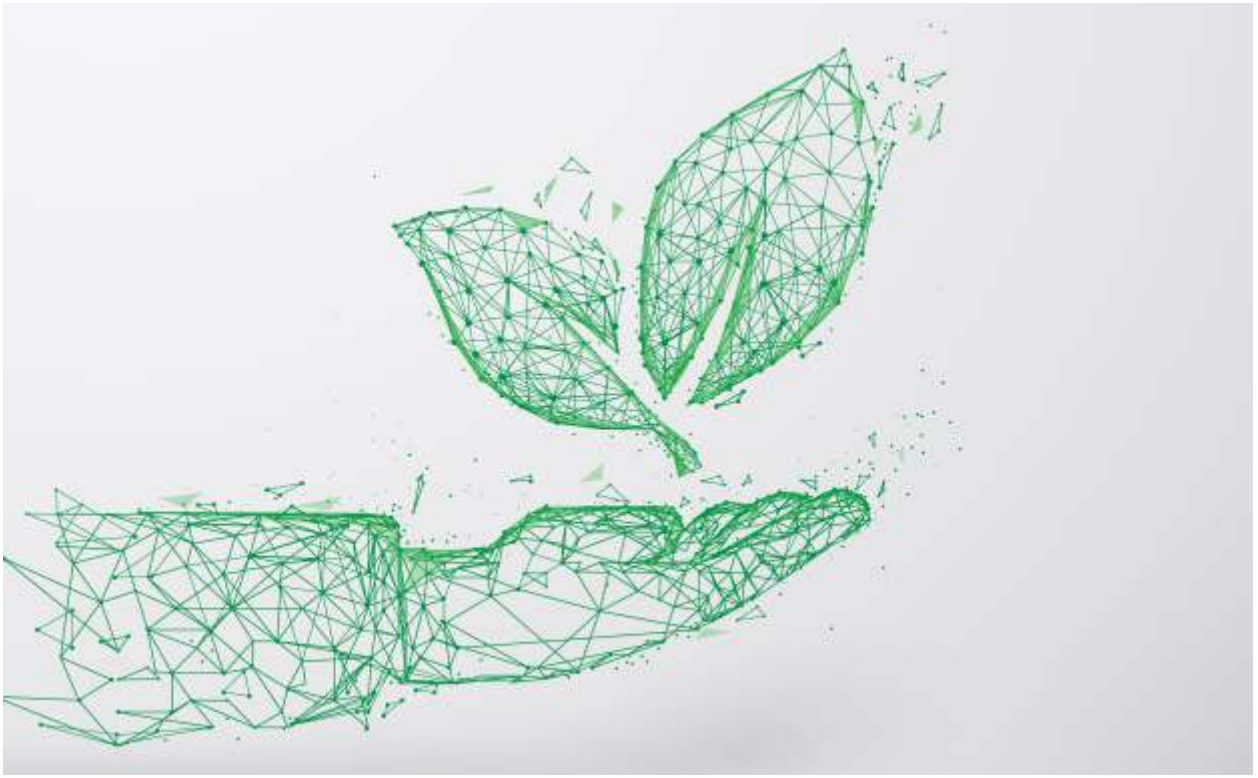
Forest landscape restoration (FLR) provides opportunities to recover ecological functions and improve livelihoods in degraded landscapes (Mansourian & Parrotta, 2020). Brazil's Atlantic Forest Restoration Pact, China's Grain for Green Programme and India's Green India Mission and the Aravalli Green Wall initiative, illustrate different approaches to restoring degraded forest landscapes and improving ecological connectivity (FAO, 2022).

Sustainable land management (SLM) is central to achieving LDN, particularly in agricultural and dryland ecosystems (UNCCD, 2022). Programmes such as Ethiopia's Green Legacy Initiative and India's watershed development initiatives demonstrate how soil and water conservation, vegetation restoration and community participation can improve ecosystem productivity and resilience.

Agroforestry offers opportunities to integrate trees with crops and livestock, thereby enhancing soil fertility, carbon sequestration and livelihood diversification (IPBES, 2019). Integrated crop-livestock-forest systems in Brazil have demonstrated the benefits of combining production with ecosystem restoration while India has promoted agroforestry through supportive policies (FAO, 2022).

Watershed restoration is another important pathway for improving water resource management and reducing soil erosion. Experiences from China's Loess Plateau restoration and India's participatory watershed programmes highlight the benefits of integrated approaches that combine vegetation restoration, water harvesting and soil conservation (GRP/IWMI, 2018).

NbS provide an overarching framework for addressing societal challenges through ecosystem conservation and restoration (UNEP, 2022). Indonesia's peatland and mangrove restoration programmes, South Africa's Working for Water Programme and India's Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI) demonstrate how restoration can generate multiple benefits for biodiversity, climate resilience and livelihoods. The diversity of restoration experiences across BRICS countries provides a strong foundation for integrated landscape-based greening.



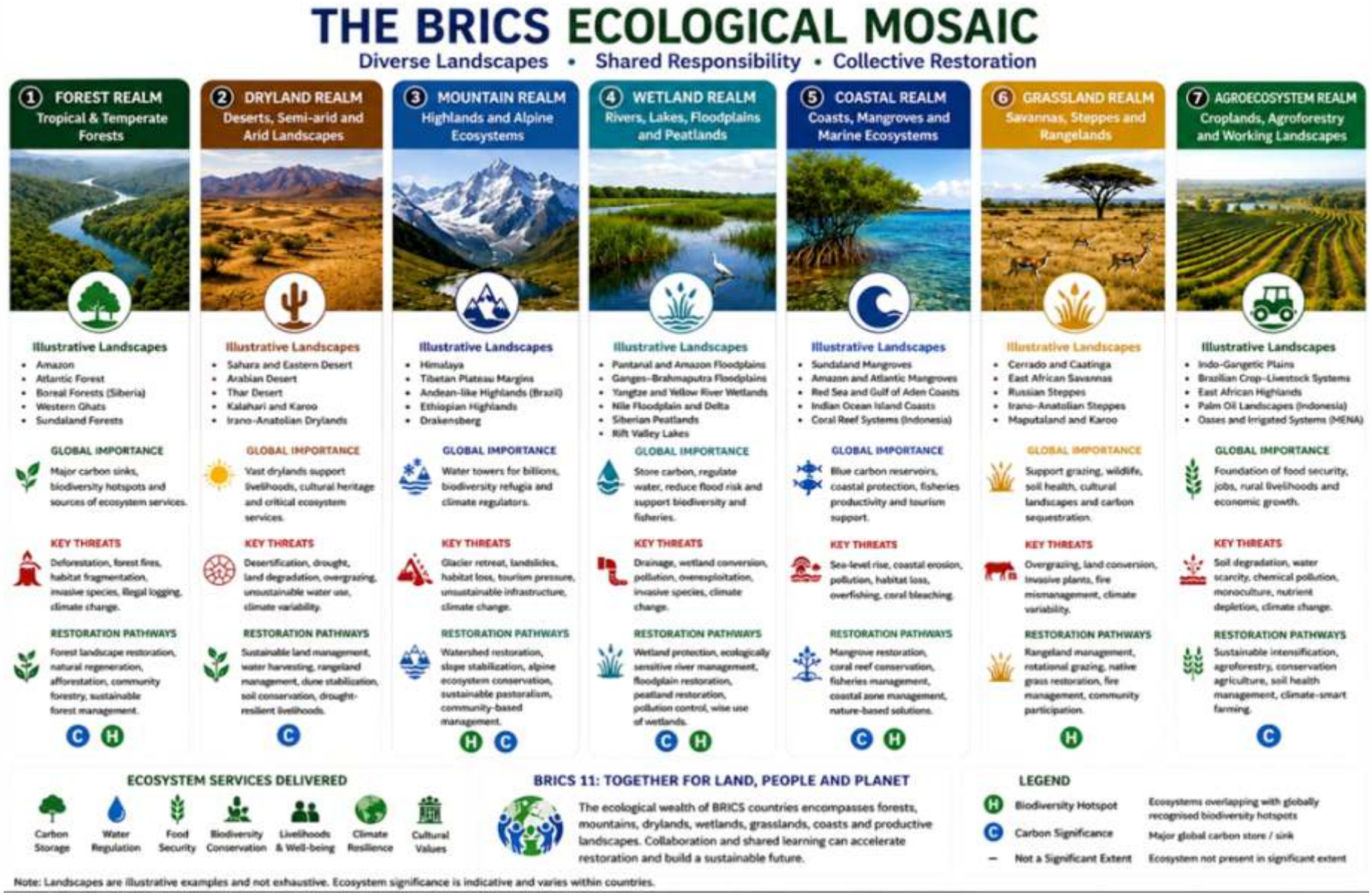


Figure 2. The BRICS Ecological Mosaic. (Source: FAO, 2025; IPBES, 2024; IPCC, 2022)

CHAPTER 3

INTEGRATED LANDSCAPE-BASED GREENING: A FRAMEWORK FOR ACTION



3 CHAPTER
INTEGRATED LANDSCAPE-BASED GREENING: A FRAMEWORK FOR ACTION

3.1 Introduction

This chapter presents a conceptual framework for integrated landscape-based greening approaches. It identifies the core components that underpin effective restoration and the enabling conditions required for successful implementation at scale. Together, these elements provide a practical foundation for advancing LDN, biodiversity conservation, climate resilience and sustainable development across diverse landscapes.

Integrated landscape-based greening is most effective when its core components are supported by enabling policy, institutional and financial conditions. Landscape planning and governance, climate-resilient restoration, community participation, and science-based adaptive management are mutually reinforcing and should be implemented in an integrated manner rather than as isolated interventions. Their successful application depends on coherent governance, sustainable financing, appropriate technologies and effective monitoring systems that enable restoration efforts to be scaled and sustained over time (UNCCD, 2022; FAO, 2022; OECD, 2018). This is a continuous and adaptive process supported by collaboration among governments, local communities, scientific institutions, the private sector and other stakeholders.

Figure 3 below presents the above-mentioned conceptual framework for integrated landscape-based greening, illustrating the relationships among the core components, enabling conditions and the multiple environmental, social and economic outcomes they seek to achieve.

The following chapter illustrates how these concepts are translated into practice through country experiences from BRICS Member Countries, showing diverse approaches to integrated landscape-based greening across different ecological and socio-economic contexts.

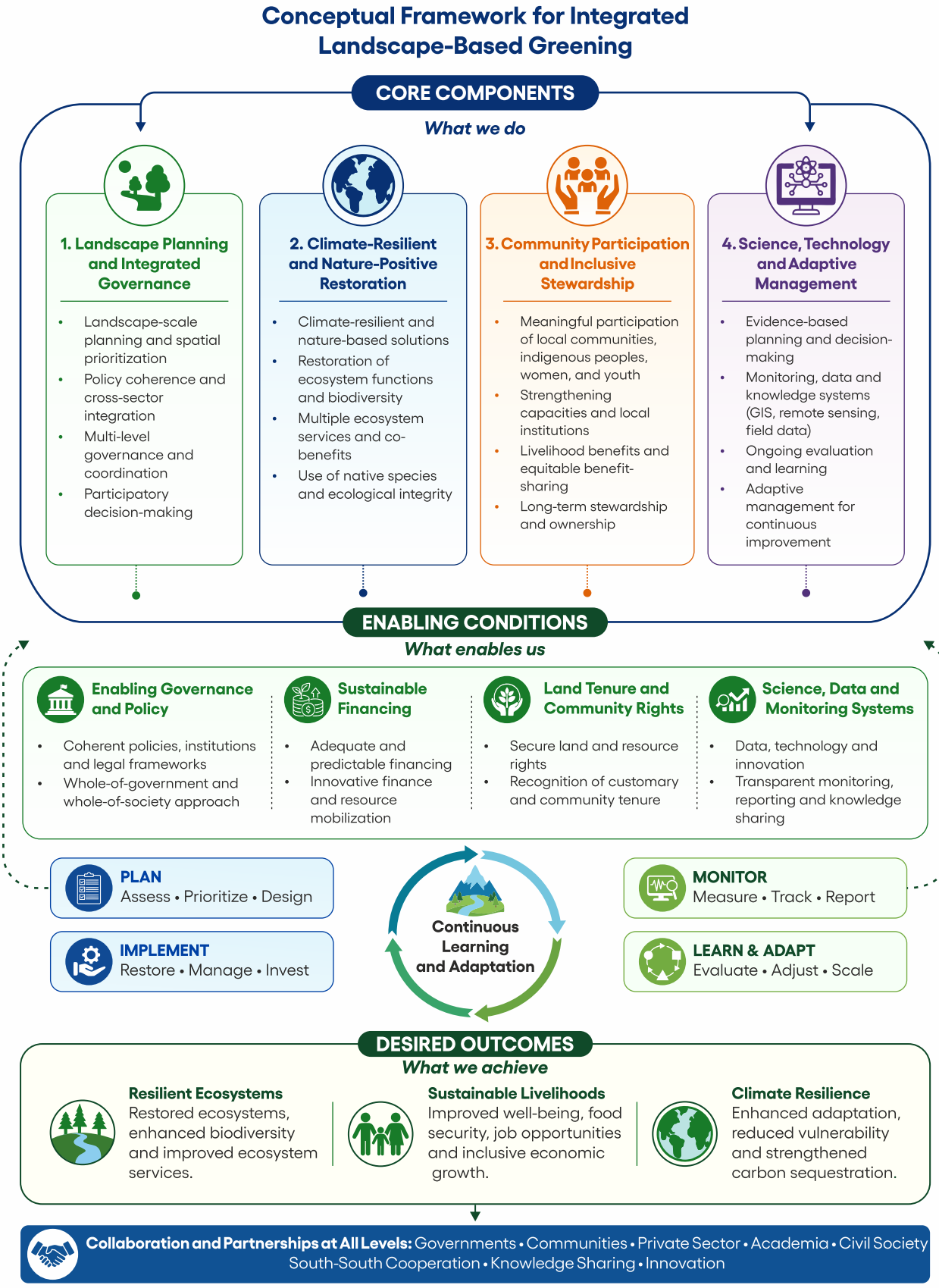


Figure 3. An Integrated Landscape-Based Greening Approach for Sustainable Landscape Restoration across BRICS Countries. (Source: Derived by the author)

3.2 Core Components of Integrated Landscape-Based Greening

Integrated landscape-based greening requires more than ecological restoration alone. Successful implementation depends on a combination of sound planning, enabling policies, scientific knowledge, stakeholder participation and long-term institutional commitment. International frameworks increasingly recognise that effective restoration must address ecological, social and economic dimensions simultaneously, ensuring that restored landscapes are environmentally resilient, socially inclusive and economically viable (UNCCD, 2022; FAO, 2022; IPBES, 2019).

Drawing on the experiences of BRICS Member Countries, this section identifies four interrelated components that underpin integrated landscape-based greening. These components reflect common characteristics observed across successful restoration initiatives rather than a prescriptive sequence of actions. Together, they provide a practical framework for planning, implementing and sustaining landscape restoration across diverse ecological and socio-economic contexts. While each component contributes a distinct dimension to integrated landscape management, their effectiveness depends on their combined application, supported by appropriate governance, financing, scientific evidence and stakeholder collaboration.

3.2.1 Landscape Planning and Integrated Governance

Integrated landscape-based greening begins with planning and governance that recognise landscapes as interconnected social-ecological systems, where forests, agricultural lands, grasslands, wetlands, rivers and human settlements influence one another. Managing these components in an integrated manner enables restoration efforts to address land degradation while simultaneously enhancing biodiversity conservation, climate resilience and sustainable livelihoods. International assessments consistently identify landscape approaches as an effective framework for achieving LDN and delivering multiple environmental and socio-economic benefits (UNCCD, 2022; FAO, 2022; IPBES, 2019).

Effective implementation requires policy coherence and coordination across sectors such as forestry, agriculture, water resources, biodiversity conservation, rural development and climate change. Rather than operating through isolated programmes, integrated governance promotes collaboration among national, sub-national and local institutions, aligns restoration with broader development priorities, and encourages participatory decision-making involving governments, local communities and other stakeholders. Such coordinated governance improves resource efficiency, reduces policy fragmentation and supports restoration outcomes that are ecologically sustainable, socially inclusive and economically viable.

3.2.2 Climate-Resilient and Nature-Positive Restoration

Integrated landscape-based greening seeks to restore ecosystem functions while strengthening resilience to climate change and enhancing biodiversity. Restoration interventions should therefore be designed to recover ecological integrity, improve soil and water resources, enhance carbon sequestration, conserve native biodiversity and increase the capacity of ecosystems and communities to adapt to climate-related stresses. NbS provide an effective approach for achieving these objectives by working with natural processes to address environmental and societal challenges simultaneously (IPCC, 2022; UNEP & FAO, 2021; UNCCD, 2022).

Well-designed restoration programmes generate multiple environmental, social and economic benefits beyond ecosystem recovery. By integrating biodiversity conservation, sustainable land management, climate adaptation and livelihood improvement, restoration can enhance ecosystem services such as water regulation, soil fertility, disaster risk reduction and food security while contributing to global commitments. Prioritising ecological integrity, biodiversity safeguards and the use of native species further improve the long-term sustainability and resilience of restored landscapes, ensuring that restoration delivers lasting benefits for both nature and people.

3.2.3 Community Participation and Inclusive Stewardship

Integrated landscape-based greening is most effective when local communities are actively involved in the planning, implementation and long-term stewardship of restoration initiatives. Indigenous peoples, local communities, women, youth and other stakeholders possess valuable ecological knowledge and play a critical role in sustaining restored landscapes. Their meaningful participation strengthens local ownership, improves restoration outcomes and enhances the long-term resilience of social-ecological systems. International assessments increasingly recognise inclusive governance and equitable participation as essential for achieving successful and sustainable restoration (IPBES, 2019; UNCCD, 2022).

Strengthening local capacities through technical training, knowledge exchange and institutional support further enables communities and local organisations to adopt sustainable land management practices and adaptive restoration approaches. Restoration initiatives that integrate livelihood improvement and community stewardship are more likely to secure long-term commitment while contributing to poverty reduction and rural development. Investing in communities is therefore equally important as investing in ecosystems, ensuring that restoration delivers lasting environmental, social and economic benefits.

3.2.4 Science, Technology and Adaptive Management

Science and technology provide the foundation for evidence-based planning, implementation and evaluation of integrated landscape restoration. Advances in remote sensing, Geographic Information Systems (GIS), Earth observation, field-based assessments and digital monitoring platforms enable countries to identify restoration priorities, monitor ecosystem condition and assess restoration outcomes with greater accuracy and efficiency. These tools support transparent decision-making, improve accountability and strengthen reporting under national and international commitments, including LDN and SDG Indicator 15.3.1 (UNCCD, 2022; FAO & UNCCD, 2023).

Effective restoration also requires adaptive management, whereby monitoring results, scientific evidence and practical experience are used to refine restoration strategies over time. Continuous learning and enhancement or modifications allow restoration programmes to respond to changing ecological conditions, climate risks and emerging knowledge, thereby improving long-term effectiveness and resilience. Strengthening scientific research, innovation and knowledge exchange will further support the development of locally appropriate restoration solutions and facilitate the scaling-up or replication of successful practices across diverse landscapes.

3.3 Enabling Conditions for Implementation

The successful implementation of integrated landscape-based greening depends not only on sound technical approaches but also on enabling policy, institutional and financial environments. Even well-designed restoration initiatives may fail to achieve long-term outcomes if they are constrained by fragmented governance, inadequate financing or weak monitoring systems. International experience demonstrates that scaling up restoration requires coordinated institutions, sustained investment, supportive policies and effective knowledge systems that facilitate planning, implementation and adaptive management (UNCCD, 2022; FAO, 2022; OECD, 2018).

Enabling conditions include integrated governance and policy coherence, sustained financing mechanisms and community rights, and science-based monitoring systems. Together, they create the institutional foundation necessary for translating landscape restoration strategies into effective and lasting outcomes across diverse ecological and socio-economic contexts

CHAPTER 4
COUNTRY BEST PRACTICES



4 CHAPTER

COUNTRY BEST PRACTICES

4.1 Introduction

The BRICS countries represent a wide diversity of ecological regions, socio-economic contexts and governance systems, yet they share a common commitment to addressing DLDD through integrated landscape-based approaches. Across the BRICS membership, restoration initiatives range from tropical forests, drylands and rangelands to mangroves, peatlands, deserts, agricultural landscapes and boreal ecosystems, reflecting the varied environmental challenges and development priorities of Member Countries. This chapter presents select national case studies shared by BRICS Member Countries that highlight practical approaches to integrated landscape-based greening implemented in their respective countries.

The case studies do not provide an exhaustive review of national programmes and focus only on flagship initiatives that reflect innovative restoration models, governance mechanisms, financing approaches, community participation, scientific and technological innovations, and ecosystem-specific interventions. Together, these examples showcase the diversity of restoration pathways adopted across BRICS countries while emphasising the shared objective of enhancing ecosystem resilience, supporting sustainable livelihoods and strengthening climate adaptation. The chapter is organised using a common framework for each country, including the restoration context, flagship initiative, implementation approach, key outcomes and innovations. Altogether, these experiences provide the empirical foundation for the cross-cutting analysis and recommendations presented in the subsequent chapters.

The best practices presented in this chapter have been drawn from submissions made by the BRICS Member Countries to the BRICS Environment Working Group (EWG) 2026, as well as from country presentations delivered at the BRICS EWG Webinar on Initiatives towards Addressing Land Degradation, Desertification and Drought, held on 22 June 2026.

4.2. Brazil

(Source: Presentation at the BRICS EWG Webinar held on 22 June 2026.)

Background

Brazil has made combatting DLDD a national priority under the UNCCD. Recognising the close links between healthy landscapes, biodiversity conservation, livelihoods and climate resilience, Brazil has adopted an integrated approach that combines ecosystem restoration with sustainable rural development. National efforts are coordinated through the National Commission to Combat Desertification (CNCD), a multi-stakeholder platform comprising government agencies, regional institutions, civil society, the private sector and the scientific community. The Commission supports the implementation of PAB-Brasil, the National Action Programme to Combat Desertification and Mitigate the Effects of Drought, which integrates environmental, agricultural, water, climate and regional development policies.

Table 3. Brazil at a Glance

Component	Details
Major ecosystem	Caatinga (semi-arid dry forests)
Primary challenge	Land degradation, desertification and drought
Flagship initiative	Recaatingar Programme
Planning unit	Watersheds and micro-watersheds
Target	Restore 10 million ha in the Caatinga; restore and convert 40 million ha of degraded pastureland through Caminho Verde Brasil (Brazilian Greenway Programme)
Key institutions	National Commission to Combat Desertification (CNCD), National Centre for Monitoring and Early Warning of Natural Disasters (CEMADEN), National Institute of the Semi-Arid Region (INSA)
Key approach	Integrated landscape restoration linked to water resource management and sustainable livelihoods

(Source: Presentation at the BRICS EWG Webinar held on 22 June 2026.)

Restoration Challenge

Brazil's restoration efforts are primarily focused on the country's semi-arid region, which includes more than 1,000 municipalities and supports millions of people. The Caatinga, the world's only exclusively Brazilian dry forest ecosystem, is particularly vulnerable to land degradation, desertification and climate change. Increasing

temperatures, changing rainfall patterns, wildfires, biodiversity loss and declining soil productivity threaten ecosystem services and rural livelihoods. Addressing these challenges requires integrated landscape planning that combines ecosystem restoration, sustainable land and water management, climate adaptation and community participation.

Flagship Initiative: Recaatingar Programme

The Recaatingar Programme is Brazil's national strategy for the social and productive restoration of degraded lands within the Caatinga biome. The programme aims to restore 10 million hectares of degraded land over the next twenty years while improving ecosystem services and strengthening local livelihoods. Built upon more than two decades of practical experience, Recaatingar is implemented through partnerships involving government institutions, universities, research organisations, civil society and the private sector.

The programme gives priority to family farmers, agrarian reform settlements, indigenous peoples, Quilombola communities and other traditional communities. Restoration activities are designed not only to recover degraded ecosystems but also to improve water resource management, food production and income generation in one of Brazil's most climate-vulnerable regions.

Implementation Approach

Recaatingar adopts a landscape-based approach, using watersheds and micro-watersheds as the primary planning units for restoration. This enables coordinated management of soil, water, vegetation and agricultural production across entire landscapes.

The programme integrates scientific knowledge with traditional practices and promotes sustainable land management through rainwater harvesting, soil and water conservation, participatory planning, sustainable livestock production and climate-resilient agricultural practices. Restoration activities are complemented by national initiatives such as:

- The One Million Cisterns Programme, which supports rainwater harvesting for drought resilience;
- The Garantia Safra Programme, or the Harvest Guarantee Programme, which provides financial protection to family farmers affected by drought;
- The Sertão Vivo Programme, which strengthens technical assistance for rural communities;
- PLANAVEG, Brazil's national programme for native vegetation recovery.

Brazil has also strengthened drought preparedness through the National Centre for Monitoring and Early Warning of Natural Disasters (CEMADEN: Centro Nacional de Monitoramento e Alertas de Desastres Naturais), which monitors drought conditions and supports early warning and risk-informed decision-making nationwide. Research and innovation are further supported by the National Institute of the Semi-Arid Region (INSA-Instituto Nacional do Semiárido), which develops sustainable land management practices and social technologies for dryland restoration.

Outcomes

Brazil's integrated approach has strengthened national coordination to combat desertification while demonstrating the effectiveness of landscape-scale restoration in semi-arid ecosystems. The Recaatingar Programme provides a long-term framework for restoring degraded lands, improving ecosystem services and enhancing the resilience of rural communities. Complementary programmes have expanded access to rainwater harvesting, drought risk management, financial support for family farmers and native vegetation restoration. In parallel, the Brazilian Green Way (Caminho Verde Brasil) aims to restore and convert 40 million hectares of low-productivity pastureland over the next decade, further strengthening Brazil's contribution to sustainable land management and climate resilience.

Key Innovations

- Multi-stakeholder governance through the National Commission to Combat Desertification (CNCD).
- Landscape-scale planning using watersheds and micro-watersheds as operational units.
- Combination of scientific knowledge and traditional practices for dryland restoration.
- Large-scale application of social technologies, including rainwater harvesting through the One Million Cisterns Programme.
- National drought monitoring and early warning systems supported by CEMADEN.
- Long-term restoration targets through the Recaatingar Programme and the Brazilian Green Way (Caminho Verde Brasil).

Innovation Spotlight: Integrated Watershed-Based Restoration for Dryland Resilience

Brazil's Recaatingar Programme (2026) demonstrates an integrated restoration model that uses watersheds and micro-watersheds as the primary planning unit, enabling simultaneous restoration of ecosystems, water resources and rural livelihoods. Combining scientific knowledge with traditional practices, it illustrates how dryland restoration can function as a comprehensive territorial development strategy rather than a stand-alone environmental intervention

4.3. China

(Source: Submission to the BRICS EWG 2026.)

Background

China has implemented large-scale ecological restoration programmes to address land degradation, desertification and declining ecosystem functions across its diverse landscapes. Recognising that ecological conditions vary considerably across regions, the country has adopted a science-based greening strategy that emphasises ecological suitability and efficient use of land and water resources. Restoration measures are tailored to local environmental conditions, with forests established where appropriate, grasslands restored in suitable areas, and degraded ecosystems rehabilitated using integrated landscape approaches. These efforts are coordinated by the National Forestry and Grassland Administration (NFGA) in collaboration with provincial and local governments.

Table 4. China at a Glance

Component	Details
Major ecosystems	Forests, grasslands, deserts, river basins and arid landscapes
Primary challenge	Land degradation, desertification, soil erosion and ecosystem degradation
Flagship initiative	Xiangyang Ecological Corridor Pilot
Planning approach	Science-based, landscape-scale and water-appropriate greening
Key institutions	National Forestry and Grassland Administration (NFGA), Hubei Provincial Forestry Department, Xiangyang Municipal Forestry Bureau
Key innovation	Precision ecological restoration and photovoltaic-based sand control
Implementation period	2 years (2023-2025)
Geographic focus	Xiangyang City, Hubei Province

(Source: Submission to the BRICS EWG 2026)

Restoration Challenge

Rapid economic development, historical land degradation and increasing climate variability have affected forest, grassland and dryland ecosystems in several regions of China. Soil erosion, declining ecosystem services and desertification remain major concerns, particularly in ecologically fragile landscapes. These challenges require

restoration approaches that improve ecosystem quality while maintaining ecological balance and supporting sustainable regional development. China has therefore emphasised landscape-scale restoration that integrates ecological restoration, water conservation, climate resilience, and sustainable resource management.

Flagship Initiative: Xiangyang Ecological Corridor Pilot

The Xiangyang Ecological Corridor Pilot in Hubei Province demonstrates China's science-based approach to ecological restoration. Implemented between 2023 and 2025, the initiative focuses on restoring degraded landscapes along the Han River and its tributaries through precision afforestation, forest tending, and restoration of degraded forests.

The project follows the principle of greening according to local conditions and available water resources, ensuring that restoration interventions are ecologically appropriate and economically viable. By improving forest structure and ecosystem functions, the initiative seeks to enhance soil and water conservation, reduce erosion, and strengthen ecological resilience throughout the watershed.

The project has restored degraded sandy lands, improved forest quality and established demonstration sites showcasing innovative approaches to ecological restoration. It also integrates ecosystem restoration with local economic development by generating employment, promoting ecological industries and increasing public participation in greening activities.

Implementation Approach

- China's restoration strategy combines science-based planning, landscape-level management and technological innovation.
- Restoration activities are guided by ecological suitability assessments, allowing interventions to be adapted to local climatic, hydrological and environmental conditions.
- Key interventions include precision afforestation, forest tending, degraded forest restoration and ecological corridor development.
- Long-term management is supported through quality control of planting materials, extended post-planting maintenance and diversified financing involving Central and Provincial Governments, local authorities and private investment.

An important innovation highlighted during the BRICS Webinar on Initiatives towards Addressing Land Degradation, Desertification and Drought is China's photovoltaic-based sand control model, which integrates renewable energy generation with desertification control.

The model combines three complementary stages:

1. Installation of photovoltaic panels to improve local microclimatic conditions.
2. Stabilisation of shifting sands using biodegradable polylactic acid (PLA) sand barriers.
3. Ecological restoration through suitable vegetation, agriculture, livestock production and traditional medicinal plants.

This integrated approach can also be applied in degraded mining areas, saline-alkali lands and rocky desertification zones, demonstrating its adaptability across different degraded landscapes.

Outcomes

The Xiangyang Pilot has demonstrated significant ecological and socio-economic benefits.

- Improved approximately 747 hectares of degraded sandy land
- Established about 3,773 hectares of new forests
- Restored 1,767 hectares of degraded forests
- Undertaken 1,140 hectares of forest tending
- Water quality in the Xiangyang section of the Han River has consistently met Class II national water quality standards, reflecting improvements in watershed health.
- Planted nearly 5 million seedlings
- Generated an estimated CNY 110 million in annual comprehensive economic benefits
- Established 12 demonstration sites showcasing innovative restoration models.

Through integrated planning, ecosystem restoration and community participation, the initiative has strengthened ecological resilience while contributing to sustainable regional development.

Key Innovations

- Science-based greening based on ecological suitability and local water availability.
- Landscape-scale restoration through ecological corridor planning.
- Precision afforestation, degraded forest restoration and long-term forest management.

- Integrated financing combining government investment with private-sector participation.
- Ecological asset valuation and carbon trading demonstration models.
- Photovoltaic-based sand control integrating renewable energy with ecosystem restoration.
- Biodegradable PLA sand barriers for efficient sand stabilisation.
- Integration of ecological restoration with agriculture, forestry and sustainable livelihoods.

Innovation Spotlight:
Photovoltaic-Based Sand Control

China developed an innovative restoration model that combines renewable energy generation with desertification control. Solar photovoltaic installations reduce evaporation and improve soil moisture, creating favourable conditions for ecological restoration. These are complemented by biodegradable PLA sand barriers and vegetation restoration interventions adapted to local environmental conditions. The model simultaneously supports ecosystem restoration, clean energy production, agriculture and rural livelihoods while contributing to the objectives of the UNCCD, UNFCCC and Convention on Biological Diversity (CBD).

4.4. Egypt

(Source: Submission to the BRICS EWG 2026.)

Background

Egypt faces unique restoration challenges as one of the world's driest countries, with approximately 86% of its territory classified as hyper-arid and a further 4% as arid. Productive landscapes are largely confined to the Nile Valley and Delta, while the Western Desert, Eastern Desert and Sinai Peninsula are characterised by severe water scarcity and fragile ecosystems. Rapid population growth, urban expansion, soil salinisation, declining soil fertility, sand dune encroachment and climate change have intensified pressures on agricultural land and natural ecosystems. In response, Egypt has adopted an integrated approach that combines sustainable land management, efficient water use, ecosystem restoration and climate adaptation to achieve its LDN commitments.

Table 5. Egypt at a Glance

Component	Details
Major ecosystems	Nile Valley and Delta, Western Desert, Eastern Desert, Sinai Peninsula and Red Sea coastal ecosystems
Primary challenge	Desertification, water scarcity, soil salinity, sand encroachment and land degradation
Flagship initiative	National Action Plan to Combat Desertification and Achieve Land Degradation Neutrality (2024–2030)
Planning unit	Vulnerable agricultural landscapes, desert ecosystems and water resource management zones
Target	Restore and improve productivity of approximately 11,666 km² (1.17 million hectares) of degraded land by 2030
Key institutions	Ministry of Environment, Ministry of Agriculture and Land Reclamation, Ministry of Water Resources and Irrigation
Key approach	Integrated dryland restoration combining sustainable land management, irrigation modernisation, ecosystem restoration and community-based natural resource management

(Source: Submission to the BRICS EWG 2026.)

Restoration Challenge

The principal challenge is to restore productivity and ecological function in water-limited landscapes while safeguarding the country's limited fertile land. Key drivers of degradation include soil salinity, water scarcity, land conversion, erosion, desertification and increasing climate variability. Protecting agricultural production and water resources, and strengthening resilience of desert and coastal ecosystems are central to Egypt's restoration strategy.

Flagship Initiative: National Action Plan for Land Degradation Neutrality (2024-2030)

Egypt's National Action Plan (2024-2030) provides the country's overarching framework for achieving LDN through integrated landscape restoration and sustainable land management. The plan targets the restoration and productivity improvement of approximately 11,666 km^2 (1.17 million hectares) by 2030 through interventions such as land reclamation, irrigation modernisation, soil salinity management, prevention of agricultural land encroachment, and rehabilitation of vulnerable ecosystems. Restoration efforts are aligned with national climate strategies and implemented through coordinated action among the Ministries of Environment; Agriculture and Land Reclamation; and Water Resources and Irrigation.

Implementation Approach

Egypt's restoration approach recognises that ecological restoration in hyper-arid landscapes depends fundamentally on effective water management. Restoration interventions integrate modern irrigation systems, wastewater treatment and reuse, rainwater harvesting, floodwater harvesting, groundwater management, and seawater desalination to improve water availability while enhancing ecosystem resilience.

Scientific planning underpins implementation using GIS, remote sensing, predictive modelling, soil salinity monitoring, and land degradation indicators to prioritise interventions and monitor restoration outcomes.

Community participation is embedded within restoration programmes. Initiatives such as the Community-Based Natural Resource Management Programme in the St. Catherine region engage local communities in conserving biodiversity, restoring native vegetation and promoting sustainable livelihoods based on traditional knowledge. Community seed banks, conservation of endemic species and ecosystem rehabilitation further strengthen local resilience.

Complementary measures include sand dune stabilisation, rehabilitation of degraded agricultural lands, mangrove restoration along the Red Sea coast, conservation of natural vegetation and expansion of climate-resilient agricultural practices.

Outcomes

Implementation of the National Action Plan has strengthened Egypt's integrated approach to combatting land degradation while improving agricultural productivity and ecosystem resilience in vulnerable landscapes. Major outcomes include:

- Targeted restoration and productivity improvement of approximately 11,666 km^2 (1.17 million hectares) under the National Action Plan (2024-2030).
- Expansion of sustainable irrigation and water management practices to enhance water-use efficiency in arid regions.
- Improved management of soil salinity and degraded agricultural lands through science-based interventions.
- Community-led restoration programmes that have strengthened biodiversity conservation and sustainable livelihoods, particularly in desert and mountain ecosystems.
- Increased application of geospatial technologies, remote sensing and predictive modelling for restoration planning and monitoring.

Key Innovations

- Water-centred restoration, integrating ecosystem rehabilitation with irrigation modernisation, wastewater reuse and water harvesting.
- Science-based land restoration, using GIS, remote sensing, predictive modelling and salinity monitoring to guide restoration planning.
- Community-based ecosystem management, exemplified by the St. Catherine programme, which combines biodiversity conservation with traditional knowledge and sustainable livelihoods.
- Integrated restoration of desert and coastal ecosystems, including mangrove rehabilitation, sand dune stabilisation and native vegetation restoration.
- Alignment of restoration with climate adaptation and food security, ensuring that restoration investments simultaneously improve environmental resilience and agricultural productivity.

Innovation Spotlight: Restoring Landscapes by Protecting Water Resources

Egypt demonstrates that in hyper-arid environments, landscape restoration begins with restoring water resources. By integrating irrigation modernization, water reuse, groundwater management, salinity control and ecosystem rehabilitation within a single restoration framework, Egypt illustrates how efficient water management can simultaneously enhance land productivity, biodiversity conservation and climate resilience

4.5. Ethiopia

(Source: Submission to the BRICS EWG 2026.)

Background

Ethiopia's ecologically diverse landscapes support biodiversity, livelihoods, and climate resilience. However, decades of unsustainable land use, deforestation, climate variability, recurrent droughts, and weak natural resource governance have led to widespread land degradation and declining ecosystem functionality, affecting agricultural productivity, water availability, biodiversity, and rural livelihoods. In response, Ethiopia has implemented several national initiatives, including the Climate Resilient Green Economy (CRGE) Strategy, the Green Legacy Initiative, the Sustainable Land Management Programme, the National Adaptation Plan, and the National Biodiversity Strategy and Action Plan. The Integrated Landscape Greening Approach builds on these efforts by providing a coordinated framework for ecological restoration, climate adaptation, sustainable production, and socio-economic development.

Table 6. Ethiopia at a Glance

Component	Details
Major ecosystems	Afro-alpine ecosystems, montane forests, dry woodlands, rangelands, wetlands, forests, watersheds and agricultural lands
Primary challenge	Deforestation, soil erosion, biodiversity loss, climate change, land degradation, drought, water availability
Flagship initiative	Climate Resilience Green Economy (CRGE) strategy, Green Legacy Initiative, Sustainable Land Management Programme, National Adaptation Plan and National Biodiversity Strategy and Action Plan
Planning unit	Landscapes with coordinated planning and management across forests, agricultural lands, watersheds, rangelands, wetlands, urban green spaces and biodiversity rich ecosystems
Target	Restore degraded landscapes, strengthen climate resilience and ecosystem services, and improve sustainable livelihoods
Key institutions	National and regional governments, local authorities, watershed committees, communities, academia, civil society, development partners and the private sector.
Key approach	Integrated Landscape Greening Approach

(Source: Submission to the BRICS EWG.)

Restoration Challenge

Landscape degradation in Ethiopia is driven by interconnected ecological, economic and social challenges. Traditional restoration efforts have often focused on isolated interventions, such as tree planting or soil conservation, without adequately addressing the broader drivers of environmental degradation or the interlinkages between ecosystems and human well-being. As a result, restoration investments may produce limited or unsustainable outcomes.

Flagship Initiative: Green Legacy Initiative, Climate Resilient Green Economy Strategy and Sustainable Land Management Programme

The Green Legacy Initiative is one of Ethiopia's flagship national programmes supporting its Integrated Landscape Greening Approach. Alongside the Climate Resilient Green Economy (CRGE) Strategy, the Sustainable Land Management Programme, the National Adaptation Plan, and the National Biodiversity Strategy and Action Plan, it contributes to the country's efforts to reverse land degradation and restore ecosystems. The Green Legacy Initiative is a key example of Ethiopia's large-scale restoration experience that offers valuable lessons for knowledge sharing and South-South cooperation on ecosystem restoration and sustainable landscape management.

Implementation Approach

Ethiopia's Integrated Landscape Greening Approach is implemented through a landscape-scale framework that integrates ecological restoration, climate adaptation, sustainable production and socio-economic development. Rather than pursuing isolated restoration activities, the approach coordinates planning and management across forests, agricultural lands, watersheds, rangelands, wetlands, urban green spaces and biodiversity-rich ecosystems. It emphasises collaboration among government institutions, local communities, the private sector, development partners, academia and civil society to achieve multiple environmental and socio-economic objectives simultaneously.

The framework is built around seven mutually reinforcing strategic components: forest landscape restoration, sustainable watershed management, climate-smart agriculture, rangeland restoration and management, urban and peri-urban greening, biodiversity conservation, and green livelihood development. Together, these interventions seek to improve ecosystem resilience, strengthen carbon sequestration, enhance water availability, increase agricultural productivity, conserve biodiversity,

and create sustainable livelihood opportunities through activities such as agroforestry, wetland restoration, efficient irrigation, sustainable value chains, ecotourism, beekeeping, bamboo development and climate-smart enterprises.

Implementation is supported by a multi-level governance framework. National leadership provides strategic direction, policy harmonisation and resource mobilisation, while regional governments coordinate landscape planning based on local ecological and socio-economic conditions. Local governments, watershed committees, community organisations, cooperatives and indigenous institutions are responsible for implementing restoration activities and monitoring progress. The approach also emphasises diversified financing, digital monitoring systems using GIS, remote sensing and drones, and knowledge exchange among research institutions, local communities, development partners and BRICS Member Countries to support adaptive management and continuous learning.

Outcomes

Ethiopia's Integrated Landscape Greening Approach has strengthened landscape restoration through:

- Forest landscape restoration including assisted natural regeneration, enrichment planting, participatory forest management and agroforestry.
- Sustainable watershed management through soil and water conservation, wetland restoration, groundwater recharge, spring protection and climate-resilient water harvesting.
- Climate-smart agriculture including conservation agriculture, integrated soil fertility management, efficient irrigation, climate-resilient crop varieties and agroecological farming.
- Rangeland restoration and sustainable grazing through improved grazing management, pasture reseeding, indigenous vegetation restoration, invasive species control and integrated livestock-water management.
- Urban greening and biodiversity conservation through urban forests, green corridors, ecological river restoration, protected area connectivity, habitat restoration and ecosystem-based adaptation.
- Green livelihoods and community stewardship, by promoting sustainable value chains, ecotourism, sustainable coffee production, beekeeping, bamboo development, medicinal plants, climate-smart enterprises and circular economy initiatives.

Key Innovations

- Integrated landscape-scale planning, coordinating restoration across forests, agricultural lands, watersheds, rangelands, wetlands, urban green spaces and biodiversity-rich ecosystems.
- Multi-stakeholder governance which brings together government, local communities, academia, civil society, development partners and the private sector for coordinated landscape management.
- Diversified green financing, including through carbon markets, biodiversity credits, payment for ecosystem services, green bonds and impact investment.
- Digital monitoring and evaluation using GIS, remote sensing, drones and digital environmental information platforms to track ecological and socio-economic outcomes.
- Knowledge exchange and South-South cooperation promoting research collaboration, technology transfer, capacity building and sharing of restoration practices within BRICS

Innovation Spotlight: Integrated Landscape Greening Approach

The Integrated Landscape Greening Approach represents an important innovation in ecosystem restoration by shifting from isolated, sector-specific interventions to a coordinated, landscape-scale framework. It recognizes forests, agricultural lands, watersheds, rangelands, wetlands, urban green spaces and biodiversity-rich ecosystems as interconnected systems and promotes collaborative planning among stakeholders to generate long-term environmental, economic and social benefits.

4.6. India

(Source: Submission to the BRICS EWG 2026.)

Background

India has adopted an integrated approach to ecological restoration that combines sustainable land management, biodiversity conservation, climate resilience and community participation. As per the recent Bonn Challenge Report, India had brought 21.76 Mha of land under restoration from 2011 to 2020.

India's progress in ecological restoration is underpinned by a multi-layered and complementary policy and programme architecture, comprising a broad portfolio of afforestation, land degradation and ecological restoration initiatives at the national and state levels, rather than a reliance on a single programme or intervention. Such programmes are implemented by not only the Ministry of Environment, Forest and Climate Change, but also others such as the Ministries of Rural Development and Agriculture among others. This extensive programme landscape provides multiple, complementary pathways for advancing restoration objectives across diverse ecosystems, land-use categories and geographical contexts.

At the individual programme level, India's various restoration initiatives adopt an integrated, landscape-based approach, addressing not only degraded land itself but also the interconnected ecological, social and livelihood dimensions of the surrounding landscape, while engaging diverse stakeholders. This is complemented by a range of dedicated afforestation, restoration and land management programmes operating across different landscapes and ecological contexts. Some of these programmes are detailed below.

Recognising the country's ecological diversity, restoration efforts are implemented through coordinated action involving national and state governments, local institutions, educational institutions and communities. India's approach places equal emphasis on ecosystem recovery, citizen participation and sustainable livelihoods.

Table 7. India at a Glance

Component	Details
Major ecosystems	Forests, grasslands, wetlands, mangroves, mountains, drylands and coastal ecosystems
Primary challenge	Land degradation, biodiversity loss, soil erosion and climate vulnerability
Flagship initiatives	*Ek Ped Maa Ke Naam;* Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI); Compensatory Afforestation Fund (CAMPA); National Mission for a Green India (GIM); Nagar Van Yojana (NVY); Namami Gange; Watershed Development Component- PM Krishi Sinchayee Yojana
Planning approach	Community-led restoration supported by science-based planning and multi-sectoral coordination
Key institutions	Ministry of Environment, Forest and Climate Change (MoEFCC), National CAMPA, Ministry of Education, State Forest Departments
Key innovation	Citizen-led environmental stewardship combined with nature-based coastal restoration
National restoration target	Restore 26 million hectares of degraded land by 2030

(Source: Submission to the BRICS EWG 2026.)

Restoration Challenge

India's diverse landscapes, including different types of forest ecosystems, agricultural lands, drylands, wetlands, mangroves and coastal ecosystems, face multiple forms of degradation. Vegetation degradation and soil erosion remain the principal drivers of land degradation, affecting ecosystem productivity, biodiversity conservation, water resource management and rural livelihoods. Coastal ecosystems are additionally threatened by shoreline erosion, cyclones, saline intrusion and habitat loss. Addressing these challenges requires restoration strategies that integrate ecological, social and economic objectives while strengthening resilience to climate change.

Flagship Initiatives

a) Ek Ped Maa Ke Naam

Launched in 2024, Ek Ped Maa Ke Naam (Plant4Mother) is a nationwide citizen-led environmental stewardship campaign that encourages every individual to plant and nurture a tree in honour of their mother. By linking environmental conservation with cultural values and emotional engagement, the initiative transforms tree planting into a long-term community responsibility rather than a one-time plantation activity.

The initiative has rapidly grown into one of the world's largest citizen-led greening campaigns, with 1,492 million seedlings planted nationwide during 2024 and 1,237.5 million seedlings during 2025.

The campaign is implemented jointly by the MoEFCC and the Ministry of Education through Eco Clubs for Mission LiFE, with active participation from schools, State Forest Departments, local governments, non-governmental organisations (NGOs) and citizens. Digital platforms enable participants to register plantations, upload geo-tagged photographs and receive digital certificates, strengthening transparency and long-term monitoring.

b) Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI)

Launched in 2023, MISHTI is India's flagship programme for restoring degraded mangrove ecosystems and strengthening coastal resilience through NbS across 13 coastal States and Union Territories. The programme aims to restore approximately 54,000 hectares of mangrove ecosystems over five years which will create an estimated carbon sink of 4.5 million tons of Carbon. This programme came into force after India joined the 'Mangrove Alliance for Climate' during COP27.

Implemented through the MoEF&CC and the State Forest Departments, restoration activities are supported through convergence of CAMPA, Viksit Bharat - Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) and others, while complementary activities promote community participation, capacity building, ecotourism and livelihood diversification.

MISHTI has brought over 26,000 hectares under restoration across 13 coastal States and Union Territories by adopting a science-based approach that integrates site-specific hydrological, salinity, and ecological assessments with the use of native mangrove species, assisted natural regeneration, and long-term monitoring.

c) The Compensatory Afforestation Fund Management and Planning Authority (CAMPA)

Created in 2016, CAMPA funds are utilised for compensating the loss of forest land and ecosystem services by raising of compensatory afforestation, improving quality of forests through assisted natural regeneration, enrichment of biodiversity, improvement of wildlife habitat, control of forest fire, forest protection and soil and water conservation measures. Under the programme, a dedicated Geospatial Monitoring and Evaluation System (GIS Lab) has been established. Also, a specialised portal has been developed, known as Harit-SANKALP Portal (System for Accreditation, Nursery Knowledge for Afforestation Linkage Platform).

d) National Mission for a Green India (GIM)

Launched in 2014, GIM is one of the eight Missions outlined under the National Action Plan on Climate Change (NAPCC). It aims to protect, restore and enhance India's forest cover and respond to climate change by a combination of adaptation and mitigation measures. It envisages a holistic view of greening and focuses on multiple ecosystem services, especially, biodiversity, water, biomass, preserving mangroves, wetlands, critical habitats etc. along with carbon sequestration as a co-benefit. It hinges upon convergence with related Missions of the NAPPCC, other complementary National Mission Programmes and schemes such as MGNREGS and CAMPA, for better coordination in developing forests and their fringe areas in a holistic and sustainable manner.

e) Nagar Van Yojana

Launched in 2020, the scheme sought to create of Nagar Vans (urban forests) in urban areas, by involving local communities, NGOs, educational institutions and local bodies. It envisages the creation of 1000 Nagar Van / Nagar Vatikas in cities with Municipal Corporations, Municipal Councils, Municipalities or Urban Local Bodies (ULBs), to provide a healthy living environment for residents, thus contributing to growth of clean, green, healthy and sustainable cities.

f) Other programmes and initiatives

Beyond programmes with a specific focus on afforestation, land degradation and ecological restoration, India has also mainstreamed restoration objectives across a wider range of sectoral programmes, implemented by various national ministries, with broader or different primary objectives. These programmes incorporate interventions that contribute to land restoration, ecological resilience and sustainable land management. Collectively, such initiatives demonstrate how ecological restoration objectives are being integrated across sectors and development priorities, thereby expanding the scale and reach of India's restoration efforts.

1. **Restoration of Thirteen Major Rivers and the Namami Gange Programme:** focussed on the rejuvenation of 13 major rivers, including River Ganga and its associated ecosystem.

2. **Watershed Component of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** While its primary focus is on improving water availability, irrigation and promote water-use efficiency, it also supports watershed development, soil and water conservation and land restoration.

3. **Mahatma Gandha National Rural Guarantee Scheme (MGNREGS):** It aims to enhance the livelihood security of rural households across the country by providing at least 100 days of guaranteed employment and supports a range of plantation and land restoration activities across the country.

4. **Desertification and Land Degradation Atlas of India:** Published by Space Applications Centre (SAC) Indian Space Research Organisation, Ahmedabad, it provides the state-wise extent of land degradation and desertification in India, which is in turn used during the planning and implementation stages of various schemes. In 2018-19, land degradation and desertification in the country was estimated to be 97.84 Mha.

Implementation Approach

- India's restoration strategy combines science-based planning, community participation and multi-sectoral convergence.
- Restoration programmes are implemented through partnerships among Central and State Governments, research institutions, educational institutions, local communities and civil society organisations.
- Digital technologies, including remote sensing, GIS, geo-tagging and online monitoring platforms, support planning, implementation and evaluation of restoration activities.
- Native species selection, landscape-specific restoration techniques and long-term monitoring help improve ecological outcomes across diverse ecosystems.
- A distinguishing feature of India's approach is the integration of ecological restoration with behavioural change and local stewardship. Through Mission LiFE, Eco Clubs and community participation, restoration initiatives seek to build long-term environmental responsibility while simultaneously enhancing biodiversity, climate resilience and sustainable livelihoods.

Outcomes

India has made significant progress toward its national restoration commitments through large-scale afforestation, community participation and ecosystem restoration programmes. At the national level, the Ek Ped Maa Ke Naam campaign has mobilised millions of citizens and educational institutions, resulting in nationwide plantation of over 3 billion seedlings and the establishment of one of the largest school-based environmental stewardship movements globally.

Similarly, through MISHTI, more than 26,000 hectares of degraded mangrove ecosystems have been brought under restoration during 2023-24 and 2024-25 across coastal regions of States and Union Territories. The programme has contributed to strengthening shoreline protection, enhancing biodiversity conservation and increasing blue carbon potential.

At the sub-national level, states across India have also made strong progress in afforestation and land restoration. For example, the state of Bihar received global recognition at the UNCCD COP-28 held in Dubai in 2023, for its successful afforestation initiatives to combat climate change, particularly actions undertaken through the Jal-Jeevan-Hariyali Abhiyan, which translates to 'water-life-greenery'. Under its Rural Development Department, the integrated approach considers the interconnected nature of water management, vegetative coverage and life. The programme is an 11-pronged strategy, involving 15 government departments and is an example of a promising way to mitigate the adverse impacts of climate change.

Together, these initiatives demonstrate how ecological restoration can simultaneously generate environmental, social and economic benefits while contributing to India's LDN and climate commitments.

Key Innovations

- Integration of ecological restoration with Mission LiFE to promote long-term behavioural change.
- Citizen-led environmental stewardship through the Ek Ped Maa Ke Naam campaign.
- School-based environmental action through Eco Clubs for Mission LiFE.
- Science-based mangrove restoration using native species and site-specific ecological assessments.
- Convergence of multiple national programmes to support restoration at scale.
- Use of remote sensing, GIS, geo-tagging and digital monitoring platforms to improve transparency and adaptive management.
- Integration of ecosystem restoration with livelihood generation, ecotourism and community participation.

Innovation Spotlight: An Integrated Architecture for Restoration

India's innovation lies in its multi-layered and complementary policy and programme architecture, bringing together a broad portfolio of dedicated restoration initiatives such as Ek Ped Maa Ke Naam and MISHTI, alongside restoration and afforestation components embedded across wider development programmes. By integrating landscape-based approaches with science, technology and community participation, this architecture enables restoration to be pursued holistically and at scale. This approach has supported India in meeting its Bonn Challenge commitment of restoring 21.76 Mha of degraded and deforested land, while enabling it to continually raise its ambition, including its enhanced commitment to restore 26 Mha by 2030.

4.7. Indonesia

(Source: Presentation at the BRICS EWG Webinar held on 22 June 2026.)

Background

Indonesia has adopted an integrated landscape approach to restore degraded forests and lands while strengthening water availability, climate resilience and sustainable livelihoods. As an archipelagic country with diverse ecosystems, Indonesia faces increasing pressures from land degradation, water scarcity and climate-related disasters. Approximately 12 million hectares of critical land had been identified across forest and non-forest areas by 2024, highlighting the need for coordinated restoration interventions.

To address these challenges, the Government of Indonesia has developed the General Plan for Forest and Land Rehabilitation, which provides a national framework for restoring degraded landscapes using watershed-based planning. Supported by the Forestry Law, Environmental Protection Law and Indonesia's commitments under the UNCCD, the strategy integrates ecological restoration into national development planning through collaboration among government agencies, local communities, academia and the private sector.

Table 8. Indonesia at a Glance

Component	Details
Major ecosystems	Tropical forests, peatlands, mangroves, watersheds and agricultural landscapes
Primary restoration challenge	Land degradation, water scarcity, peatland degradation and climate-related disasters
Flagship initiative	General Plan for Forest and Land Rehabilitation
Planning approach	Integrated watershed and landscape-based restoration
Key institutions	Ministry of Forestry, Government of Indonesia
Key innovation	Watershed-based planning integrating forest rehabilitation, peatland restoration and community forestry
Geographic focus	Critical watersheds and degraded forest landscapes across Indonesia

(Source: Presentation at the BRICS EWG Webinar held on 22 June 2026.)

Restoration Challenge

Indonesia's restoration efforts seek to address interconnected challenges including land degradation, declining watershed health, water scarcity, peatland degradation and increasing climate-related disasters. Degraded upstream catchments have affected downstream water availability and quality, while damaged peatlands and forests have become increasingly vulnerable to wildfires, biodiversity loss and greenhouse gas emissions.

Recognising these interconnections, Indonesia has adopted a landscape-scale approach that treats watersheds as functional ecological units, enabling restoration activities to simultaneously improve ecosystem health, disaster resilience and community livelihoods.

Flagship Initiative: General Plan for Forest and Land Rehabilitation

Indonesia's General Plan for Forest and Land Rehabilitation serves as the national framework for restoring degraded forest and non-forest landscapes. The programme prioritises restoration based on watershed conditions, degraded land status, water catchment health and disaster vulnerability, ensuring that interventions are targeted where they deliver the greatest ecological and social benefits.

The programme combines several complementary restoration models, including forest and land rehabilitation, integrated watershed management, and peatland and mangrove restoration. Reforestation, agroforestry, soil and water conservation, peatland rewetting, revegetation and ecosystem restoration are implemented through coordinated action across landscapes rather than isolated project sites.

Community participation is central to implementation. Through the Social Forestry Programme, local communities are empowered to manage forests sustainably, diversify livelihoods through agroforestry and participate actively in ecosystem restoration. Community fire prevention groups further strengthen local stewardship by reducing wildfire risks and protecting restored landscapes.

Implementation Approach

Indonesia's restoration strategy is founded on three complementary principles: landscape-based management, watershed-based planning, and multi-stakeholder collaboration. Restoration activities integrate forests, agriculture, water resources and human settlements, recognising that ecological processes extend across administrative boundaries.

Implementation combines ecological restoration with ecosystem-based disaster risk reduction through interventions such as forest rehabilitation, watershed conservation, water harvesting, early warning systems and post-disaster ecosystem recovery. Peatland restoration focuses on rewetting degraded peatlands, revegetation and livelihood revitalisation, while mangrove restoration strengthens coastal resilience and biodiversity.

Science and technology support implementation through geotagging of planted trees, online monitoring systems and geospatial information for tracking restoration progress. Indonesia is further strengthening transparency by developing real-time monitoring systems to improve accountability and adaptive management.

Outcomes

Indonesia's integrated restoration approach has strengthened ecosystem resilience while improving water availability and supporting sustainable livelihoods. Watershed rehabilitation has enhanced both water quantity and quality for downstream communities, while peatland and mangrove restoration have reduced wildfire risks, increased carbon storage and improved biodiversity conservation.

The Social Forestry Programme has enabled local communities to participate directly in restoration while generating livelihood opportunities through sustainable forest management and agroforestry. The use of digital monitoring and geotagging has also improved transparency and strengthened long-term management of rehabilitation programmes.

Key Innovations

- Integrated watershed-based planning as the foundation for landscape restoration.
- Landscape-scale management linking forests, agriculture, water resources and settlements.
- Integration of ecosystem restoration with disaster risk reduction.
- Community-based restoration through the Social Forestry Programme.
- Peatland rewetting combined with livelihood revitalisation.
- Geotagging and digital monitoring to improve transparency and adaptive management.
- Community fire prevention groups supporting long-term ecosystem protection.

Innovation Spotlight: Watershed-Based Landscape Restoration

Indonesia demonstrates how watersheds can serve as the primary planning unit for ecological restoration. Integrating forest rehabilitation, soil and water conservation, peatland restoration, mangrove rehabilitation and community forestry within entire watershed systems, Indonesia improves upstream-downstream connectivity, enhances water availability, reduces disaster risks and supports sustainable livelihoods. This combined landscape governance approach with strong digital monitoring provides a replicable model for integrated landscape restoration across diverse ecological conditions.

4.8. Russia

(Source: Presentation at the BRICS EWG Webinar held on 22 June 2026.)

Background

Russia possesses the world's largest land resources, spanning boreal forests, Arctic and sub-Arctic regions, temperate landscapes, steppes and drylands. Although endowed with extensive natural ecosystems, Russia faces growing challenges from land degradation, desertification and climate change. Recognising these threats, the country has adopted a science-based approach centred on the LDN framework to guide sustainable land management, restoration planning and evidence-based decision-making across diverse ecological regions.

Table 9. Russia at a Glance

Component	Details
Major ecosystems	Boreal forests, steppe, Arctic and sub-Arctic ecosystems, arid and semi-arid regions
Primary challenge	Land degradation, desertification, declining soil productivity and climate change impacts across diverse ecosystems
Flagship initiative	National Action Programmes to Combat Desertification based on the Land Degradation Neutrality (LDN) framework
Planning unit	Region-specific action plans across 14 constituent entities supported by LDN assessments and geo-information systems
Target	Restore degraded lands, improve soil productivity and strengthen ecosystem resilience through science-based restoration planning
Key institutions	Ministry of Natural Resources and Environment; Centre for Combatting Desertification (Moscow and Volgograd); Russian scientific research institutions
Key approach	Science-based restoration using LDN assessments, geospatial monitoring, carbon assessment and ecosystem-specific restoration technologies

Restoration Challenge

Russia's principal challenge is to assess and manage land degradation across highly diverse ecosystems, ranging from agricultural lands to boreal forests and industrial landscapes. Climate change, declining soil productivity and ecosystem degradation require restoration strategies that can identify degradation hotspots, prioritise interventions and support long-term landscape resilience.

Flagship Initiative: Land Degradation Neutrality-Based National Action Programmes

Russia has integrated the concept of LDN into its National Action Programmes to Combat Desertification, developing region-specific restoration strategies for 14 constituent entities. The programmes combine scientific assessments, geospatial analysis and ecosystem monitoring to identify degradation hotspots, restore degraded lands and return them to productive use. The LDN framework is applied across multiple sectors, including agriculture, forestry and industrial landscapes, demonstrating its adaptability beyond traditional dryland environments.

Implementation Approach

Russia's restoration strategy is founded on scientific research, geospatial technologies and continuous environmental monitoring. Specialised research centres in Moscow and Volgograd develop restoration methodologies, evaluate ecosystem recovery and support regional restoration planning.

Operational geo-information systems, remote sensing, desertification mapping and field validation are used to identify degradation hotspots and monitor restoration outcomes. Carbon pool assessments, soil surveys and pedo-ecological mapping provide additional evidence for prioritising restoration investments and evaluating ecosystem recovery.

Region-specific restoration technologies are tailored according to the severity of land degradation, enabling restoration of agricultural landscapes while strengthening ecosystem resilience. Scientific collaboration and international knowledge exchange further support innovation and continuous improvement of restoration practices.

Outcomes

Russia's science-driven approach has strengthened national capacity for monitoring and restoring degraded landscapes through:

- Preparation of National Action Programmes for combatting desertification across 14 constituent entities.
- Development and testing of operational geo-information systems for desertification monitoring.
- Establishment of pilot monitoring sites for validating restoration technologies.
- Development of methodologies for mapping land degradation and identifying restoration hotspots.
- Integration of carbon pool assessments and ecosystem monitoring into restoration planning.
- Strengthened scientific cooperation supporting evidence-based land management.

Key Innovations

- Application of the LDN framework across agriculture and forestry.
- Development of operational geo-information systems for real-time desertification monitoring.
- Integration of remote sensing, field validation and pedo-ecological mapping for restoration planning.
- Carbon pool assessments to evaluate restoration effectiveness and ecosystem resilience.
- Region-specific restoration technologies adapted to different degradation intensities and ecological conditions.

Innovation Spotlight: Science as the Foundation for Restoration

Russia demonstrates how scientific assessments can guide large-scale landscape restoration. By integrating LDN assessments, geospatial monitoring, carbon accounting and ecosystem-specific restoration technologies, Russia has developed an evidence-based framework that supports restoration planning across diverse climatic regions, from Arctic ecosystems to drylands.

4.9. United Arab Emirates

(Source: Presentation at the BRICS EWG Webinar held on 22 June 2026.)

Background

The United Arab Emirates (UAE) is one of the world's most water-scarce countries, where desertification, land degradation and climate change pose significant challenges to sustainable development. Recognising the close interlinkages between ecosystem health and climate resilience, the UAE has adopted an integrated restoration strategy that combines ecosystem restoration, technological innovation and strong institutional coordination. NbS serve as the cornerstone of this approach, supporting biodiversity conservation, sustainable land management and long-term environmental resilience.

Table 10 . The United Arab Emirates at a Glance

Component	Details
Major ecosystems	Desert landscapes, coastal ecosystems, mangroves and rangelands
Primary challenge	Desertification, water scarcity, land degradation, biodiversity loss and climate change
Flagship initiative	National Strategy to Combat Desertification (2022-2030)
Planning unit	National ecosystem restoration programmes integrating terrestrial, coastal and rangeland ecosystems
Target	Plant 100 million mangrove trees by 2030 while strengthening ecosystem resilience through Nature-based Solutions
Key institutions	Ministry of Climate Change and Environment; National Team on Desertification, Land Degradation and Drought
Key approach	Nature-based Solutions integrating ecosystem restoration, water security, biodiversity conservation and climate resilience

(Source: Presented at the BRICS EWG Webinar held on 22 June 2026.)

Restoration Challenge

The UAE faces the dual challenge of restoring degraded ecosystems while enhancing resilience to water scarcity, desertification and climate change. Rapid urbanisation, sand and dust storms, biodiversity loss and increasing pressure on limited natural resources require restoration approaches that simultaneously improve ecosystem services and support sustainable development.

Flagship Initiative: National Strategy to Combat Desertification (2022-2030)

The National Strategy to Combat Desertification (2022-2030) provides the overarching framework for sustainable land management and ecosystem restoration in the UAE. The strategy integrates restoration of degraded lands, conservation of biodiversity, sustainable rangeland management and climate adaptation under a coordinated national framework. Implementation is overseen by the UAE Council of Ministers and supported by the National Team on Desertification, Land Degradation and Drought, ensuring coordination across Federal and Local Government institutions.

Implementation Approach

The UAE places NbS at the centre of its restoration strategy. Large-scale mangrove restoration, sustainable rangeland management and rehabilitation of degraded ecosystems are implemented alongside measures to improve biodiversity conservation and strengthen ecosystem services. The country has committed to planting 100 million mangrove trees by 2030, with more than 30 million trees already planted, while also co-leading the global Mangrove Alliance for Climate (MAC) with Indonesia to restore 15 million hectares of mangroves worldwide.

The UAE complements restoration efforts with investments in water innovation. Initiatives such as the Mohamed bin Zayed Water Initiative and the UAE Research Program for Rain Enhancement Science support research, technology development and innovative solutions for addressing drought and water scarcity.

The restoration programme is further strengthened through protected area management, conservation of plant genetic resources, establishment of national gene banks and application of advanced technologies for environmental monitoring and climate resilience.

Outcomes

The UAE has strengthened national restoration efforts through an integrated NbS framework, achieving significant progress in ecosystem conservation and climate resilience. Major outcomes include:

- Commitment to plant 100 million mangrove trees by 2030, with over 30 million trees already established.
- Co-leadership of the Mangrove Alliance for Climate, promoting restoration of 15 million hectares of mangroves globally by 2030.
- Expansion of protected areas, with 18.4% of the country's terrestrial area under protection.
- Strengthened institutional coordination through the National Strategy to Combat Desertification and the National Team on Desertification, Land Degradation and Drought.
- Increased investment in water innovation, ecosystem restoration and biodiversity conservation through dedicated national programmes.

Key Innovations

- NbS integrating ecosystem restoration with climate adaptation.
- Large-scale mangrove restoration as a multi-functional strategy for coastal protection, carbon sequestration and biodiversity conservation.
- Integration of restoration with water innovation through rain enhancement research and drought resilience initiatives.
- Conservation of genetic resources through national gene banks and international seed conservation partnerships.
- Strong institutional coordination linking ecosystem restoration, climate policy and sustainable land management.

Innovation Spotlight: Nature-based Solutions for Climate Resilience

The UAE demonstrates how NbS can simultaneously address land degradation, water scarcity and climate change. By integrating mangrove restoration, sustainable rangeland management, biodiversity conservation and water innovation within a unified national strategy, the UAE illustrates how ecosystem restoration can deliver multiple environmental, social and climate benefits in arid landscapes.

CHAPTER 5
CROSS-CUTTING ANALYSIS AND SYNTHESIS



5 CHAPTER CROSS-CUTTING ANALYSIS AND SYNTHESIS

5.1 Common Enabling Factors

The country case studies show that, despite their diverse ecological, socio-economic and institutional contexts, successful landscape restoration across BRICS Member Countries depends on a common set of enabling factors. Restoration strategies range from dryland rehabilitation and watershed management to mangrove restoration, afforestation and ecosystem-based adaptation. However, the experiences show that long-term success depends on integrated governance, science-based planning, stakeholder participation and sustained investment rather than on individual interventions.

Seven cross-cutting enabling factors emerge consistently across the national experiences:

5.1.1 Strong Political Commitment and Policy Support

High-level political commitment is essential for scaling up landscape restoration. Most BRICS countries have integrated restoration objectives into national development strategies, climate policies and commitments under the UNNCD. National strategies such as Brazil's National Action Programme to Combat Desertification, Egypt's National Action Plan to Combat Desertification and Achieve Land Degradation Neutrality, Ethiopia's Climate-Resilient Green Economy Strategy, India's Green India Mission and MISHTI, Indonesia's General Plan for Forest and Land Rehabilitation, Russia's Land Degradation Neutrality-based regional action programmes and the UAE's National Strategy to Combat Desertification demonstrate this commitment. Together, they show how policy alignment creates an enabling environment for long-term restoration efforts.

5.1.2 Landscape-Scale Planning and Integrated Approaches

Effective restoration extends beyond site-level interventions to address ecological processes across entire landscapes. Countries increasingly use watersheds, river basins, coastal ecosystems and ecological corridors as planning units, integrating forests, agriculture, water resources and human settlements within a coordinated planning approach. This integrated landscape approach improves ecological connectivity, enhances ecosystem resilience and generates multiple environmental and socio-economic benefits simultaneously.

5.1.3 Science-Based Planning and Evidence-Informed Decision Making

Scientific evidence guides restoration planning across BRICS countries. Remote sensing, GIS, ecological assessments, soil and water monitoring, land degradation assessments and climate modelling are increasingly used to identify priority areas, design interventions and evaluate restoration outcomes. Science-based approaches improve restoration effectiveness and support adaptive management under changing climatic conditions.

5.1.4 Community Participation and Inclusive Governance

Active participation of local communities remains one of the strongest determinants of the success of restoration efforts. Community-based watershed management, social forestry, citizen-led tree planting campaigns, participatory planning and engagement of indigenous peoples and local communities strengthen local ownership and improve the long-term sustainability of such initiatives. Restoration programmes that integrate local knowledge with scientific expertise are better suited to local ecological and socio-economic conditions.

5.1.5 Multi-Sectoral Coordination and Institutional Partnerships

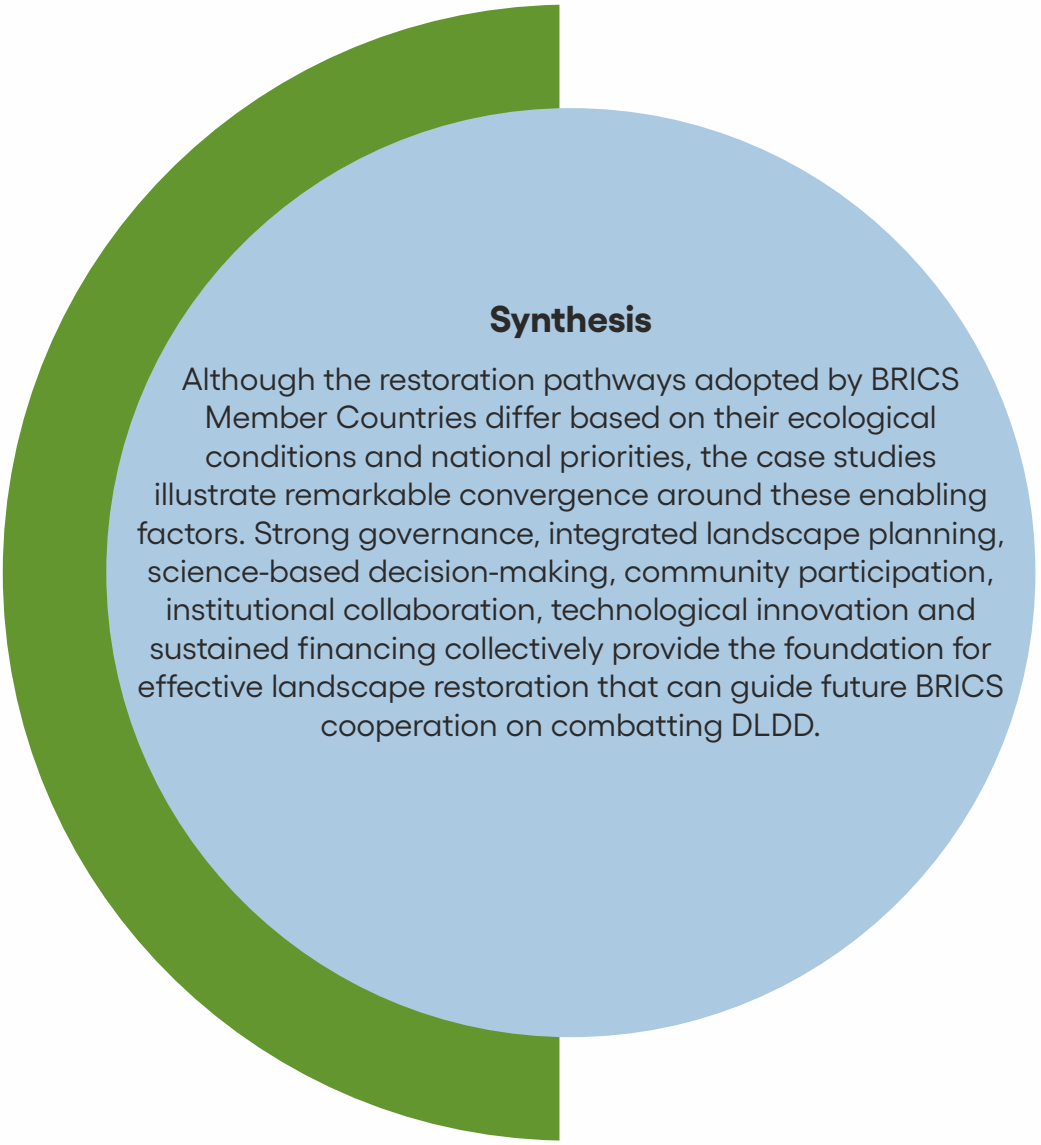
Land degradation is a complex challenge that cannot be addressed by a single institution. Effective restoration programmes rely on coordination among ministries responsible for environment, forestry, agriculture, water resources, rural development and disaster management, together with research institutions, local governments, civil society organisations and the private sector. Such institutional collaboration supports integrated planning, efficient resource use and coherent policy implementation.

5.1.6 Innovation, Technology and Monitoring Systems

Technological innovation is increasingly supporting restoration planning, implementation and monitoring. Countries have adopted geospatial technologies, digital monitoring platforms, geo-tagging, early warning systems, biodiversity monitoring, carbon assessment and ecosystem modelling to improve transparency, accountability and adaptive management. Emerging innovations, including renewable energy integrated with ecosystem restoration, digital citizen participation platforms and real-time monitoring systems, highlight the growing role of technology in landscape restoration.

5.1.7 Sustainable Financing and Long-Term Programme Continuity

Large-scale restoration requires sustained financial commitment over the long term. BRICS countries have adopted a range of financing approaches, including public investment, climate finance, convergence of government programmes, public-private partnerships and innovative funding mechanisms. Integrating restoration into broader development programmes and providing long-term institutional support are essential for sustaining restoration outcomes beyond individual project cycles.



5.2 Persistent Challenges

Despite the considerable progress demonstrated across BRICS countries, the case studies reveal that landscape restoration continues to face a number of persistent technical, institutional, financial and socio-economic challenges. While the nature and magnitude of these challenges vary across countries and ecosystems, several common constraints continue to influence the effectiveness, scalability and long-term sustainability of restoration programmes.

Seven common challenges emerge:

5.2.1 Sustaining Long-Term Financing

One of the most frequently reported challenges is securing adequate and predictable financing for long-term restoration. While many countries have successfully mobilised public investment and development assistance, restoration requires sustained financial support extending well beyond initial implementation. Long-term maintenance, monitoring and adaptive management often receive less attention than plantation or infrastructure activities. Expanding restoration finance through climate finance, private-sector participation and payment for ecosystem services, where applicable, remains a common priority across BRICS countries.

5.2.2 Strengthening Institutional Coordination

Landscape restoration inherently spans multiple sectors, including forestry, agriculture, water resources, biodiversity conservation, climate change and rural development. Coordinating policies, institutions and implementation across these sectors remains a significant challenge. Although several countries have established inter-agency coordination mechanisms, differences in institutional mandates, planning processes and monitoring systems continue to affect implementation efficiency and integrated landscape governance.

5.2.3 Scaling Local Successes

Many effective restoration initiatives have been demonstrated at local or landscape scales; however, replicating these experiences nationally presents additional challenges. Restoration approaches often require adaptation to local ecological conditions, socio-economic contexts and governance arrangements. Scaling up, therefore, requires flexible planning frameworks, sustained institutional support, capacity development and effective knowledge-sharing mechanisms rather than uniform implementation models.

5.2.4 Monitoring Restoration Outcomes

Although significant progress has been made in adopting geospatial technologies and digital monitoring systems, measuring restoration success beyond area restored remains a continuing challenge. Countries increasingly recognise the need to monitor ecosystem functionality, biodiversity recovery, carbon sequestration, soil health, water resources and livelihood outcomes using standardised and scientifically robust indicators. Strengthening long-term monitoring systems is essential for adaptive management and highlighting restoration impacts.

5.2.5 Balancing Conservation and Livelihood Objectives

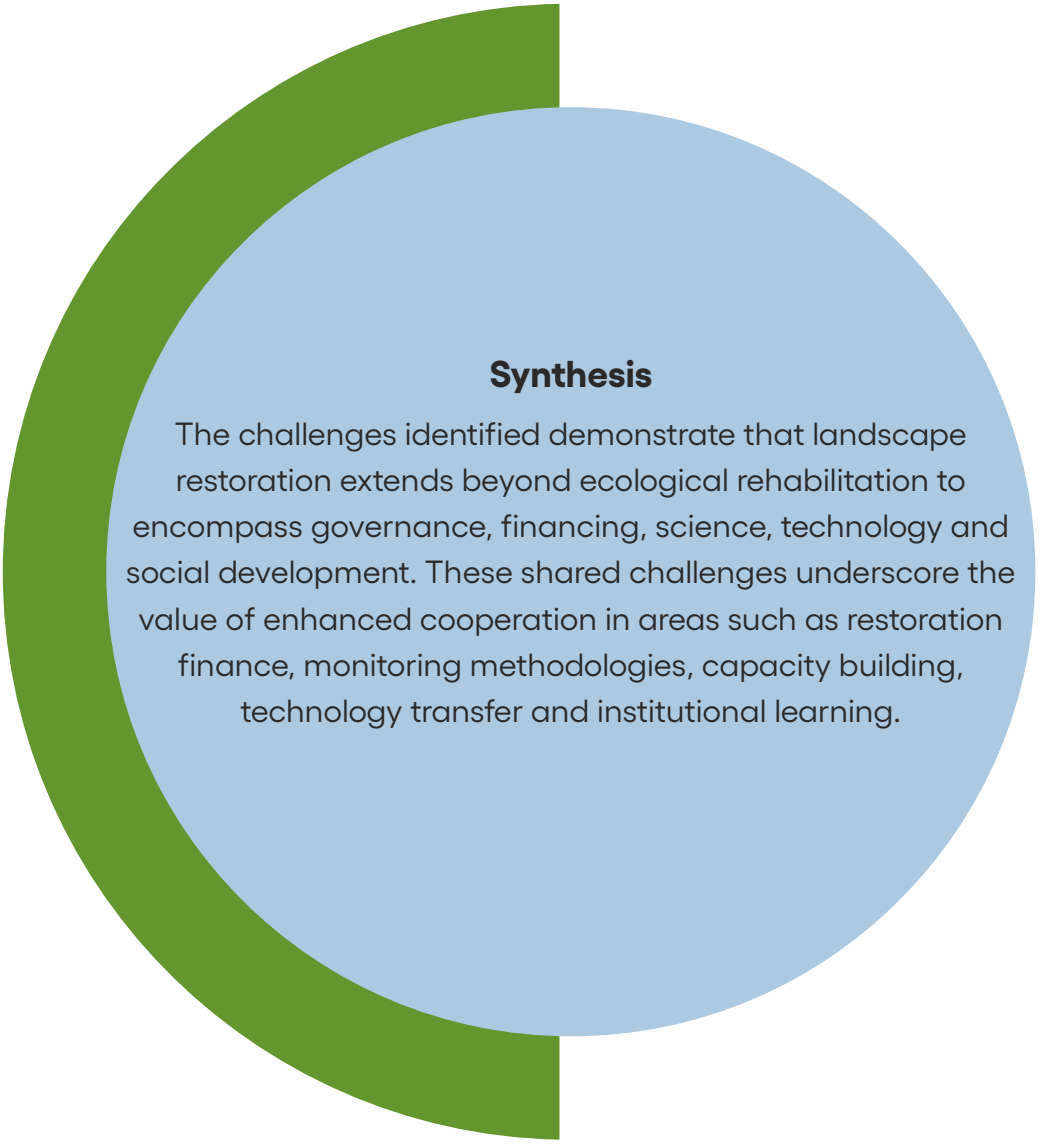
Many restoration programmes are implemented in landscapes that support agriculture, livestock production and rural livelihoods. Balancing ecological restoration with economic development therefore remains an ongoing challenge. Successful programmes more widely seek to integrate restoration with livelihood enhancement, climate resilience and sustainable resource use. However, maintaining this balance requires continuous stakeholder engagement, equitable benefit-sharing and locally appropriate restoration strategies.

5.2.6 Addressing Climate Uncertainty

Climate variability and the increasing frequency droughts, floods, wildfires and extreme weather events present additional risks to the success of restoration efforts. Changing climatic conditions influence species survival, water availability, ecosystem recovery and long-term restoration outcomes. Building climate resilience through ecosystem-based adaptation, drought preparedness, climate-smart agriculture and adaptive management has therefore become a increasingly important component of restoration planning across BRICS countries.

5.2.7 Building Technical and Institutional Capacity

Implementing integrated landscape restoration requires multidisciplinary expertise in ecology, forestry, hydrology, remote sensing, spatial planning, community engagement and monitoring. Several countries identify the need to further enhance technical capacity, extension services, research networks and institutional learning to support large-scale restoration programmes. Continued investment in capacity building and knowledge exchange remains essential for sustaining restoration efforts over the long term.



5.3 Innovations and Emerging Approaches

The country experiences presented in this Compendium show that landscape restoration is evolving towards integrated approaches that simultaneously focus on ecological restoration, climate resilience, biodiversity conservation and sustainable livelihoods. Although restoration priorities differ across BRICS countries, several emerging approaches illustrate how innovation is improving the effectiveness, scalability and sustainability of restoration programmes.

5.3.1 Integrated Landscape Planning

A notable trend across BRICS countries is the transition from site-based interventions to landscape-scale restoration. Countries progressively use watersheds, river basins, ecological corridors and coastal landscapes as planning units, enabling coordinated management of forests, agriculture, water resources and human settlements. This approach recognises ecological connectivity and enhances the delivery of multiple ecosystem services while reducing conflicts among competing land uses.

5.3.2 Digital Technologies and Smart Monitoring

Digital technologies are transforming restoration planning and monitoring. Remote sensing, GIS, geo-tagging, real-time monitoring platforms, ecological modelling and early warning systems are progressively supporting evidence-based decision-making. AI tools and applications can support restoration in difficult or remote terrains, contribute to scientific understanding of species diversity, monitor compliance and create foresight models to detect degradation sites or illegal deforestation through satellite imagery. Countries have also begun integrating digital platforms to monitor plantation progress, assess restoration outcomes and improve transparency and accountability. These technologies enable adaptive management while improving reporting under international environmental commitments.

5.3.3 Nature-Based Solutions for Climate Resilience

NbS have emerged as a central approach for addressing the interconnected challenges of land degradation, biodiversity loss and climate change. Mangrove restoration, watershed rehabilitation, ecosystem-based disaster risk reduction, dryland restoration and sustainable rangeland management demonstrate how ecosystem restoration can simultaneously enhance carbon sequestration, reduce disaster risks and improve climate resilience while generating socio-economic benefits.

5.3.4 Community-Centred Restoration Models

Several BRICS countries have illustrated that restoration programmes achieve greater long-term success when local communities are active partners in planning, implementation and monitoring. Community forestry, social forestry, participatory watershed management, citizen-led plantation campaigns as well as traditional knowledge, knowledge of the indigenous peoples and local knowledge systems, have reinforced local ownership while improving restoration outcomes. These experiences reinforce the importance of integrating scientific knowledge with local practices and ensuring that restoration contributes directly to community well-being.

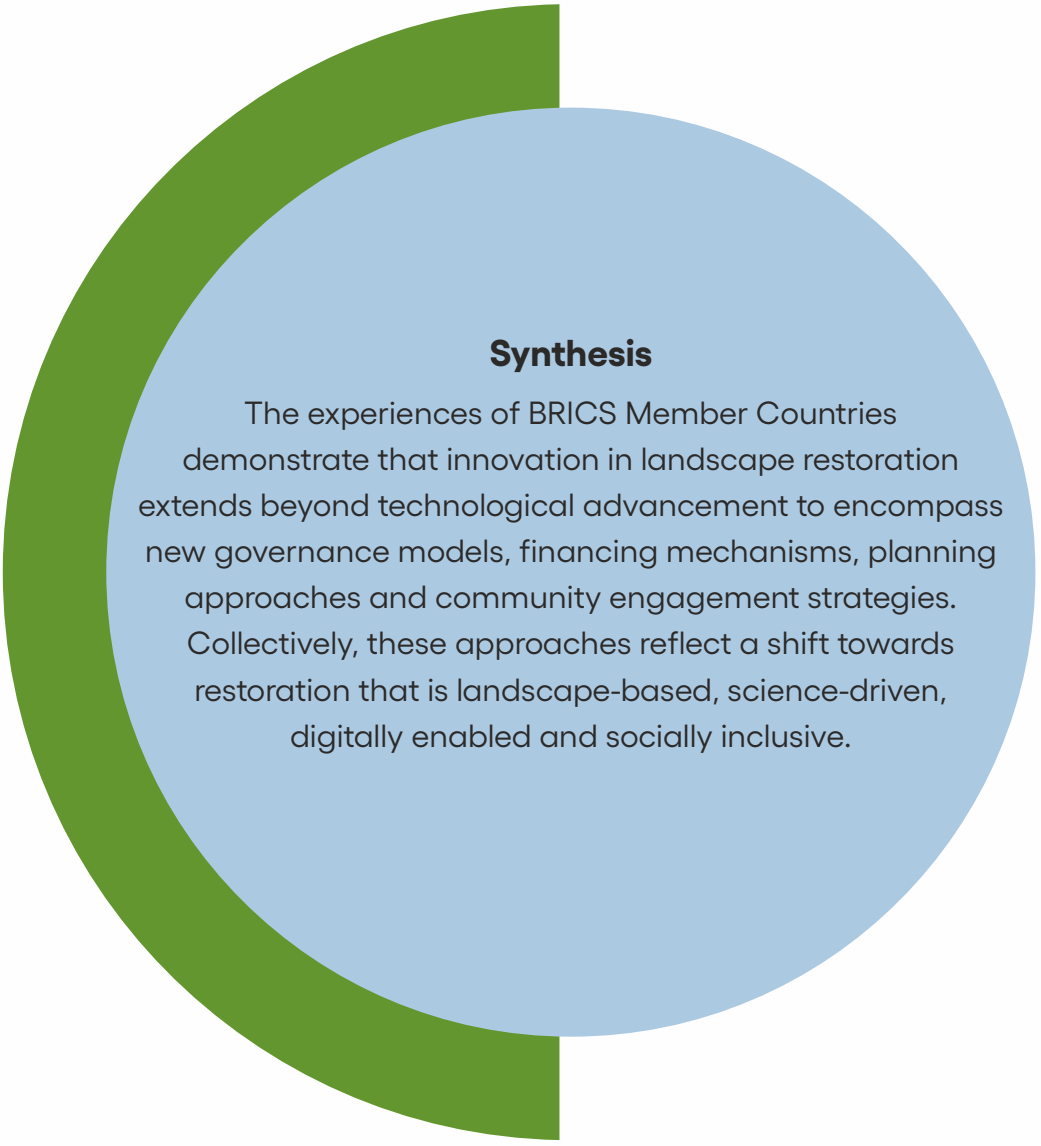
5.3.5 Innovative Financing and Programme Convergence

Countries are progressively adopting integrated financing models that combine public investment with convergence across multiple government programmes, climate finance and private-sector participation. Rather than implementing restoration as isolated projects, several initiatives align restoration with rural development, watershed management, agriculture, employment generation and biodiversity conservation programmes. Such convergence improves resource efficiency, enhances implementation capacity and supports long-term sustainability.

5.3.6 Science, Innovation and Technology Integration

Scientific innovation is more widely supporting restoration through improved ecological assessments, climate modelling, biodiversity monitoring, carbon accounting and ecosystem evaluation. Several countries have also implemented innovative restoration models tailored to local conditions, including renewable energy

integrated with desert restoration, advanced geospatial assessment systems, climate-smart agriculture and ecosystem-specific restoration technologies. These approaches illustrate how science and technology can accelerate restoration while supporting evidence-based policy development.



5.4 Gender and Social Inclusion

The BRICS Member Country experiences prove that successful landscape restoration depends not only on ecological interventions but also on meaningful participation by the people who live and work within restored landscapes. Over time, restoration programmes are designed to promote social inclusion by engaging women, indigenous peoples, local communities, youth and other stakeholders as active partners in planning, implementation and long-term stewardship. This participatory approach enhances local ownership, improves restoration outcomes and ensures that environmental benefits are accompanied by social and economic gains.

5.4.1 Community Participation as the Foundation of Restoration

Community participation emerged as one of the most consistent features of successful restoration initiatives across BRICS countries. Programmes involving local communities in planning, implementation and monitoring have demonstrated higher levels of ownership and long-term sustainability. Community-based watershed management, social forestry, participatory natural resource management and citizen-led restoration initiatives illustrate how local stewardship contributes to maintaining restored landscapes while improving livelihoods and resilience.

5.4.2 Empowering Women and Marginalised Groups

Several countries have explicitly engaged women and marginalised communities into restoration programmes. Women participation extends from nursery development and ecosystem restoration to monitoring, sustainable agriculture and livelihood diversification. Programmes have also recognised the important role of indigenous peoples, traditional communities and rural populations in conserving biodiversity and managing natural resources. Such approaches contribute to greater equity while enhancing the effectiveness of restoration through diverse knowledge systems and local leadership.

5.4.3 Youth Engagement and Environmental Stewardship

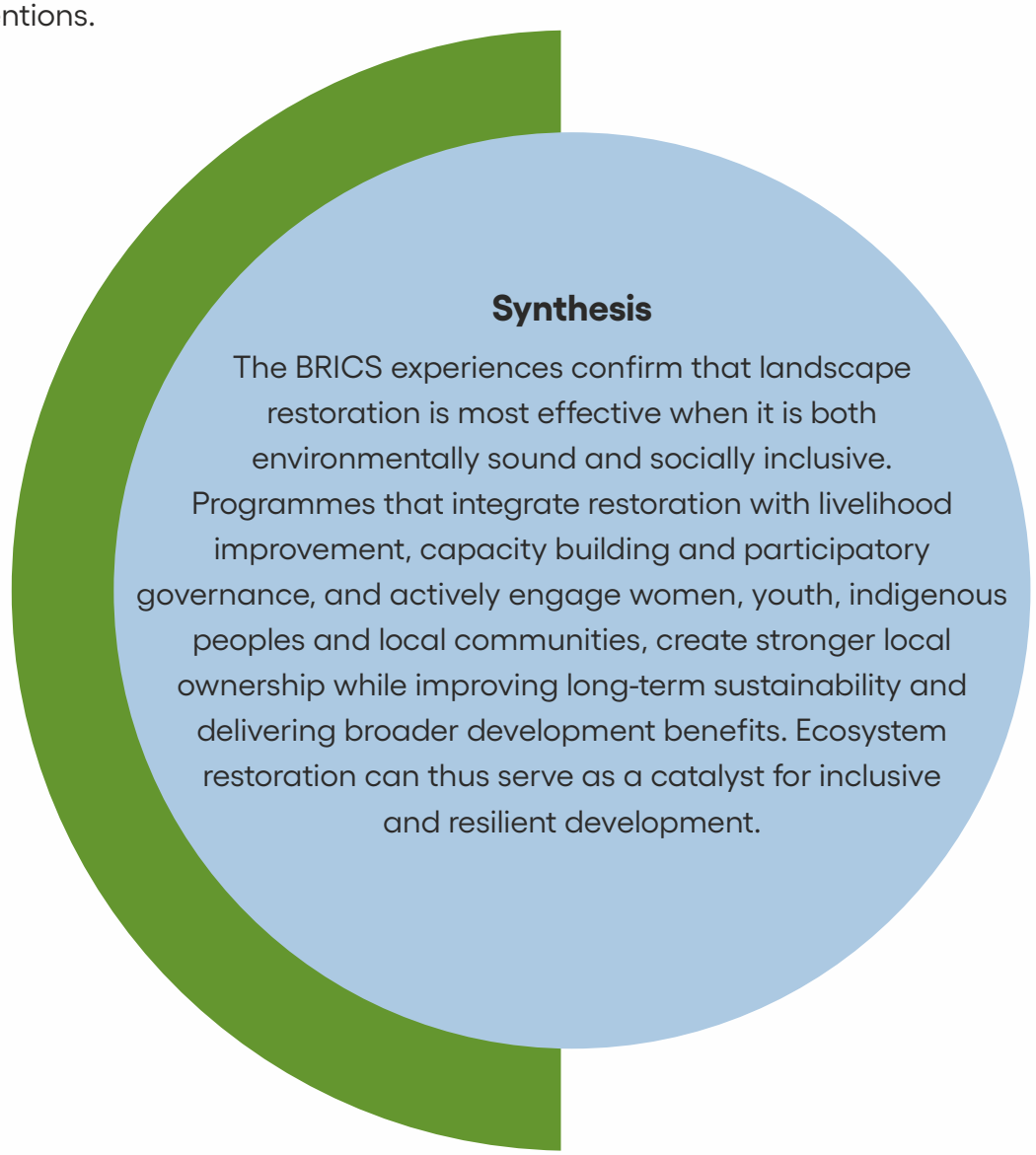
Youth engagement is increasingly recognised as an investment in the long-term sustainability of restoration efforts. School-based environmental programmes, Eco Clubs, awareness campaigns and volunteer initiatives encourage environmental stewardship among younger generations while strengthening public participation in restoration. These initiatives illustrate how restoration can foster environmental responsibility and build future capacity for sustainable landscape management.

5.4.4 Restoration as a Driver of Sustainable Livelihoods

The country case studies consistently demonstrate that restoration is more sustainable when it generates tangible socio-economic benefits. Many programmes integrate restoration with sustainable agriculture, agroforestry, ecotourism, employment generation and income diversification. By linking ecosystem restoration with improved livelihoods, countries have enhanced community support for long-term conservation while reducing pressures that contribute to land degradation.

5.4.5 Integrating Traditional and Scientific Knowledge

Several BRICS countries have adopted restoration approaches that combine scientific knowledge with traditional ecological practices. Indigenous and local knowledge contributes valuable understanding of native species, land management, water conservation and ecosystem dynamics, particularly in fragile and culturally significant landscapes. Integrating these knowledge systems with modern science has improved the ecological suitability and social acceptance of restoration interventions.





CHAPTER 6

SUGGESTED PATHWAYS FOR A RESTORATIVE AND INTEGRATED LANDSCAPE



6 CHAPTER SUGGESTED PATHWAYS FOR A RESTORATIVE AND INTEGRATED LANDSCAPE

6.1 Capacity Building

The development of technical and institutional capacity is essential for scaling up restoration efforts across the diverse landscapes of BRICS Member Countries. While several countries have established centres of excellence and institutions, technical expertise remains unevenly distributed across sectors and regions. Strengthening capacity at all levels may therefore be a key priority for implementing restoration programmes effectively.

BRICS countries may strengthen their cooperation through joint capacity-building initiatives, including training programmes, professional exchanges and collaborative learning in integrated landscape restoration, watershed management, sustainable land management, drought resilience, NbS and ecosystem monitoring. Greater attention may also be given to strengthening the capacity of local governments, extension agencies and community organisations that are directly involved in implementing restoration programmes.

6.2 Monitoring Frameworks

A robust monitoring system is essential for evaluating restoration outcomes, improving accountability and supporting adaptive management. Across the BRICS Member Countries, the use of remote sensing, GIS, geospatial databases, digital monitoring platforms, AI tools and applications and early warning systems is expanding rapidly. At the same time, differences in methodologies, indicators and reporting approaches continue to limit the comparability of restoration outcomes. BRICS Member Countries may strengthen cooperation by improving the interoperability of geospatial datasets, developing harmonised restoration indicators and promoting common approaches for assessing ecological and socio-economic outcomes. Collaboration may also focus on integrating Earth observation technologies, field-based assessments and digital reporting systems, while encouraging the exchange of technical methodologies and good practices. Drawing on existing international reporting frameworks, the BRICS group may further explore the development of a voluntary knowledge-sharing framework to facilitate the exchange of restoration data, case studies and monitoring approaches. Such a framework could support national reporting while promoting regional learning and technical cooperation.

6.3 Restoration Finance

A sustained and diversified financing strategy is essential for achieving large-scale restoration objectives. The experiences across BRICS Member Countries show that successful restoration depends on a combination of public investment, innovative financing approaches, private-sector participation and active community involvement. The expansion of financial resources beyond traditional public-sector funding will be important for supporting long-term restoration programmes. To achieve this, BRICS Member Countries may strengthen cooperation by sharing experiences on payment for ecosystem services, carbon markets, green bonds and public-private partnerships that support ecosystem restoration.

Closer collaboration with multilateral development banks and international financial institutions can help mobilise long-term investments for restoration programmes. At the local level, appropriate financing mechanisms should support community-based restoration initiatives that generate sustainable livelihoods and improve ecosystem health. BRICS Member Countries may also develop practical guidance on restoration investment models and the economic valuation of ecosystem services to strengthen financial planning and encourage greater investment in landscape restoration.

6.4 Research and Innovation

The scientific research and technological innovation are key drivers of modern restoration efforts across BRICS Member Countries. The experiences presented in the country case studies show the increasing use of remote sensing, artificial intelligence, digital monitoring platforms, photovoltaic-based restoration, climate-smart agriculture, drought forecasting and ecosystem modelling. A stronger collaboration among research institutions can further accelerate the development and application of these technologies for landscape restoration.

BRICS Member Countries may strengthen collaborative research by promoting joint research projects, technology development and knowledge exchange among universities, research institutions and national centres of excellence. Priority areas may include ecosystem restoration under changing climatic conditions, drought resilience, the restoration of degraded drylands, blue carbon ecosystems, biodiversity recovery, carbon sequestration and ecosystem service assessment. Emerging technologies, including Earth observation, artificial intelligence, drones, digital twins, environmental DNA, climate modelling and decision-support systems, offer new opportunities to improve restoration planning, monitoring and adaptive management across diverse landscapes. Collaborative innovation programmes and shared research infrastructure can further support the development, testing and application of these technologies across BRICS countries.



CHAPTER 7
CONCLUSION



CHAPTER 7

CONCLUSION

Desertification, land degradation and drought remain among the major environmental and developmental challenges of the twenty-first century, with far-reaching consequences for, biodiversity conservation, climate resilience and sustainable livelihoods. BRICS countries, representing a wide range of ecosystems, have adopted diverse approaches to restore degraded landscapes and strengthen ecosystem resilience. Together, these approaches reaffirm that successful restoration requires an integrated landscape-based approach that recognises the ecological, social and economic linkages within landscapes. Combining science-based planning, community participation, sustainable livelihood development, technological innovation and effective institutional coordination enables countries to deliver multiple environmental and socio-economic benefits.

Although the countries differ in their national priorities and ecological conditions, several common lessons emerge from the case studies. Restoration is more effective when it is implemented at the landscape scale, supported by enabling policies, guided by scientific evidence and carried out with the active participation of local communities and indigenous peoples. The increasing application of geospatial technologies, digital monitoring systems, nature-based solutions, climate-smart practices and innovative financing mechanisms has strengthened restoration planning and implementation. These approaches also contribute to achieving multiple global commitments, including Land Degradation Neutrality and the objectives of the Paris Agreement and the Kunming-Montreal Global Biodiversity Framework. At the same time, the country experiences highlight the value of stronger cooperation among BRICS countries through knowledge exchange, collaborative research, technical capacity development, monitoring systems and innovative financing.

As BRICS continues to strengthen its role in global sustainable development, integrated landscape-based greening provides a strong foundation for collective action. Continued collaboration to restore degraded ecosystems, strengthen resilience to climate change and drought, conserve biodiversity and improve human well-being will enable BRICS Member Countries to make a meaningful contribution to the achievement of the Sustainable Development Goals while supporting a more resilient, inclusive and sustainable future.

REFERENCES





REFERENCES

Bonn Challenge. (2011). The Bonn Challenge: A global effort to restore 350 million hectares of the world's deforested and degraded land by 2030. Bonn, Germany: International Union for Conservation of Nature (IUCN) and the Government of Germany.

Convention on Biological Diversity (CBD). (2022). Kunming-Montreal Global Biodiversity Framework. Montreal, Canada: Secretariat of the Convention on Biological Diversity.

Convention on Biological Diversity (CBD). 2024. Kunming-Montreal Global Biodiversity Framework: 2030 Targets (with Guidance Notes). Montreal: CBD Secretariat.

Food and Agriculture Organization of the United Nations (FAO) & United Nations Environment Programme (UNEP). (2021). The United Nations Decade on Ecosystem Restoration 2021-2030: Strategy. Rome, Italy: FAO and UNEP.

Food and Agriculture Organization of the United Nations (FAO), and United Nations Convention to Combat Desertification (UNCCD). (2023). Good Practice Guidance for SDG Indicator 15.3.1: Proportion of Land That Is Degraded over Total Land Area. Rome and Bonn: FAO and UNCCD.

Food and Agriculture Organization of the United Nations (FAO). (2025). Global Forest Resources Assessment 2025. Rome, Italy: FAO. https://openknowledge.fao.org/server/api/core/bitstreams/2dee6e93-1988-4659-aa89-30dd20b43b15/content/FRA-2025/annexes.html

Food and Agriculture Organization of the United Nations (FAO). (2025). Global Forest Resources Assessment 2025. Rome, Italy: FAO. https://openknowledge.fao.org/server/api/core/bitstreams/2dee6e93-1988-4659-aa89-30dd20b43b15/content/FRA-2025/annexes.html

Food and Agriculture Organization of the United Nations (FAO). 2022. The State of the World's Forests 2022: Forest Pathways for Green Recovery and Building Inclusive, Resilient and Sustainable Economies. Rome: FAO.

Food and Agriculture Organization of the United Nations (FAO). 2024. Land Statistics 2001-2022: Global, Regional and Country Trends. Rome: FAO.

Food and Agriculture Organization of the United Nations (FAO). 2025. Global Forest Resources Assessment 2025: Key Findings. Rome: FAO.

Global Center on Adaptation. 2021. State and Trends in Adaptation 2021. Rotterdam: Global Center on Adaptation.

Global Resilience Partnership (GRP), and International Water Management Institute (IWMI). 2018. Nature-Based Integrated Watershed Management Solutions. Colombo: IWMI.

Intergovernmental Panel on Climate Change (IPCC). (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK and New York, NY, USA: Cambridge University Press.

Intergovernmental Panel on Climate Change (IPCC). 2023. Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva: IPCC.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). 2019. Global Assessment Report on Biodiversity and Ecosystem Services. Bonn: IPBES Secretariat.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). (2023). Thematic Assessment Report on the Interlinkages Among Biodiversity, Water, Food and Health (Nexus Assessment). Bonn, Germany: IPBES.

International Union for Conservation of Nature (IUCN). 2017. Issues Brief: Blue Carbon. Gland: IUCN.

International Union for Conservation of Nature (IUCN). n.d. Global Ecosystem Typology v2.0. Accessed [Month Day, Year]. https://global-ecosystem-typology.org/.

Keith, David A., Jesús Ramón Ferrer-Paris, Emily Nicholson, and Richard T. Kingsford. 2020. The IUCN Global Ecosystem Typology 2.0: Descriptive Profiles for Biomes and Ecosystem Functional Groups. Gland: IUCN.

Mansourian, Stephanie, and John A. Parrotta. 2020. "Forest Landscape Restoration: State of Play." Ambio 49 (1): 31-40. https://doi.org/10.1007/s13280-019-01191-3.

Organisation for Economic Co-operation and Development (OECD). 2018. Why Is Policy Coherence Essential for Achieving the 2030 Agenda? Paris: OECD Publishing.

Ramsar Convention Secretariat. (2024). Global Wetland Information System (GWIS). Gland, Switzerland: Ramsar Convention Secretariat.

Sayer, Jeffrey, Terry Sunderland, Jaboury Ghazoul, Jean-Laurent Pfund, Douglas Sheil, Erik Meijaard, et al. 2013. "Ten Principles for a Landscape Approach to Reconciling Agriculture, Conservation, and Other Competing Land Uses." Proceedings of the National Academy of Sciences 110 (21): 8349-56. https://doi.org/10.1073/pnas.1210595110.

UK Centre for Ecology & Hydrology (UKCEH). 2021. Peatlands Factsheet. Wallingford: UK Centre for Ecology & Hydrology.

United Nations Convention to Combat Desertification (UNCCD). (2015). Land Degradation Neutrality: Target Setting Programme (LDN TSP). Bonn, Germany: United Nations Convention to Combat Desertification.

United Nations Convention to Combat Desertification (UNCCD). (2022). Global Land Outlook, Second Edition: Land Restoration for Recovery and Resilience. Bonn, Germany: UNCCD. www.unccd.int/sites/default/files/2022-04/UNCCD_GLO2_low-res_2.pdf

United Nations Convention to Combat Desertification (UNCCD). 2022. Global Land Outlook, Second Edition: Land Restoration for Recovery and Resilience. Bonn: UNCCD.

United Nations Convention to Combat Desertification (UNCCD). 2023. Did You Know? #LandRestoration Isn't Just About Saving the Environment. Bonn: UNCCD.

United Nations Convention to Combat Desertification (UNCCD). 2025. Drought, Desertification and Land Degradation Factsheet. Bonn: UNCCD Secretariat.

United Nations Environment Programme (UNEP), and Food and Agriculture Organization of the United Nations (FAO). 2021. UN Decade on Ecosystem Restoration 2021-2030: Strategy. Nairobi and Rome: UNEP and FAO.

United Nations Environment Programme (UNEP). 2022. Nature-Based Solutions: Opportunities and Challenges for Scaling Up. Nairobi: UNEP.

United Nations Framework Convention on Climate Change (UNFCCC). (2015). The Paris Agreement. Bonn, Germany: United Nations Framework Convention on Climate Change.

United Nations Framework Convention on Climate Change (UNFCCC). 2017. Opportunities and Options for South-South Cooperation on Nationally Determined Contributions (NDC South-South Cooperation Report). Bonn: UNFCCC Secretariat.

World Bank. (2025). World Development Indicators. Washington, DC: World Bank. Available at: https://databank.worldbank.org/source/world-development-indicators

World Bank. 2024. World Development Indicators: Agriculture and Rural Development. Washington, DC: World Bank.

BRICS
INDIA 2026

NOTES



BUILDING FOR RESILIENCE, INNOVATION, COOPERATION AND SUSTAINABILITY