



Mainstreaming Nature into Country Climate Development Reports

A Preliminary Assessment of Opportunities
and Needs

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Full Report
September 2025

ABOUT THIS REPORT

SUGGESTED CITATION:

Ranger, N, Pasqua, C and Armijo, N. (2025) Mainstreaming Nature into Country Climate Development Reports: A Preliminary Assessment of Opportunities and Needs. CLEAN Helpdesk. Available: <https://www.clean-helpdesk.org/>.

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ACKNOWLEDGMENTS

The authors would like to sincerely thank our collaborators and reviewers from the UK Foreign, Commonwealth and Development Office (FCDO), UK Department of Environment, Food and Rural Affairs, the World Bank, and the CLEAN Helpdesk for their inputs to shape this research and comments on the drafts. Any remaining errors remain those of the authors. We would also like to thank the FCDO for their kind support of this research via the CLEAN Helpdesk.

ABOUT CLEAN

The CLimate, Environment, and Nature (CLEAN) Helpdesk is a tailored query helpdesk that offers support on climate, environment and nature mainstreaming as well as providing support on Paris Alignment and nature proofing compliance.

The CLEAN Helpdesk aims to support the United Kingdom's government's delivery of meaningful contributions to build resilience to current and future climate impacts, halt and reverse global nature loss, as well as halve global emissions.

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Tegallalang, Kabupaten de Gianyar, Bali, Indonesia, Photo by Guillaume Marques via UnSplash

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Executive Summary

The World Bank’s Country Climate and Development Reports (CCDRs) are important diagnostic tool in the World Bank’s toolbox to support clients to integrate climate and nature risks and opportunities into policy and operations. The Bank describes the CCDRs as a core diagnostic designed to guide policy priorities and decisions by public and private stakeholders, and to inform World Bank Group priorities at the country level or through its global initiatives. To date, CCDRs have been completed for 72 economies since they were initiated in 2022 and the World Bank’s own analyses show that they have already had a direct influence on government policies and action, as well as actions by international finance institutions (IFIs) and others. For climate, the CCDRs provide high quality, comprehensive and well-tailored analyses.

In 2021, the World Bank committed to integrate nature within its analyses and advice to clients and invest in tools. This report assesses how nature is included within the CCDRs. The commitment, made within the *World Bank Group Climate Change Action Plan 2021-2025*, reflects the vital importance of natural capital, biodiversity, and ecosystems services to development identified by the World Bank and its partners, including its foundational role in climate adaptation and mitigation and the risks to development of degradation of ecosystems. This priority is also reflected in the addition to the World Bank’s mission of ‘*a liveable planet*’. This assessment reviews how nature is included in the CCDRs to date. It frames ‘nature’ in the context of its contribution to people, i.e. a focus on ecosystem services rather than the intrinsic or cultural values of nature. This framing is proposed as it aligns with the people-centred mission of the World Bank to “*end extreme poverty and boost shared prosperity on a liveable planet*”.

The analysis finds that while the CCDRs have made important strides in integrating the interlinkages between nature, climate and development, there remains significant opportunity to more fully reflect nature-related issues that are critical to both climate resilience and sustainable development. Some aspects of nature fall outside the original scope of the CCDRs, which were primarily designed to address climate and development. However, even within this scope, the analysis highlights that deeper integration of the interlinkages between nature, climate and development would enhance the diagnostic value of the CCDRs. This points to a methodological opportunity to strengthen future reports and ensure they provide the most comprehensive and actionable insights for clients.

To date, while aspects of nature are included, inclusion is not comprehensive

or systematic. This could mean that key risks and opportunities for development, climate and nature are missed, and in some cases, climate risks may be underestimated. Our assessment concluded that the CCDRs do include aspects of nature – in particular, identifying the amplifying role of ecosystem degradation on climate impacts, the benefits of preserving natural capital in terms of emissions reductions, and the opportunities from carbon markets. But this is a narrow lens on the vital importance of nature for the World Bank’s goals of poverty alleviation, development and shared prosperity. Given the direct importance of natural capital in underpinning growth, development and resilience.

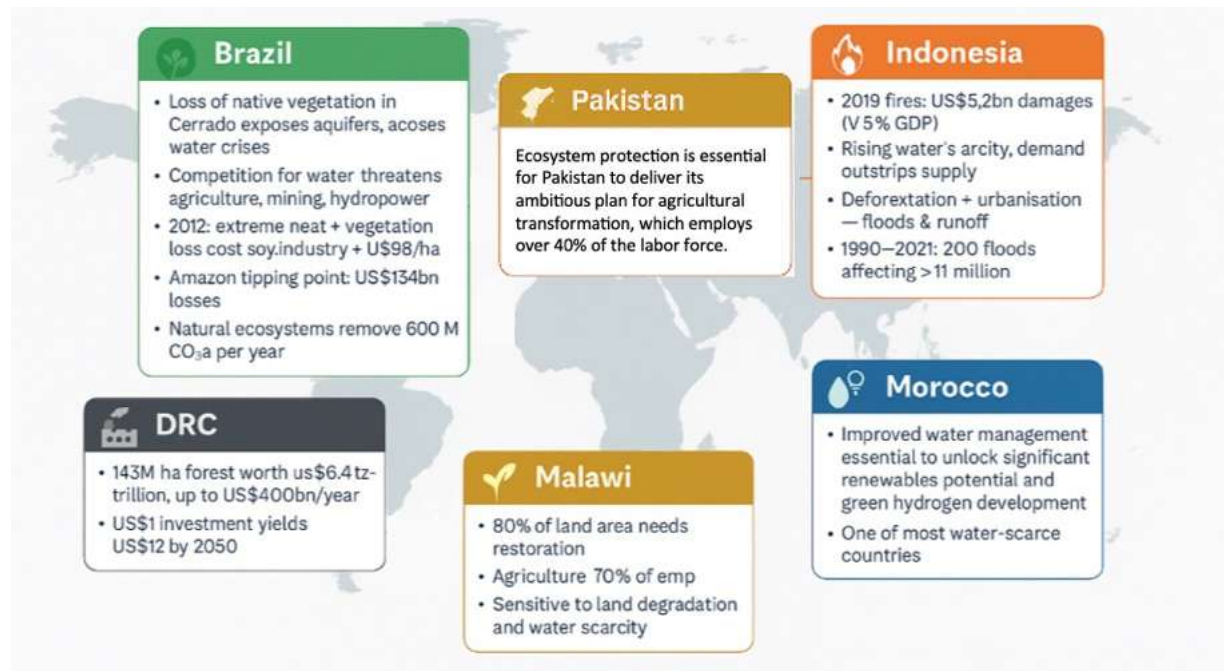
The current focus on the links between nature, climate mitigation and climate adaptation is not fully reflective of where the largest win-wins of preserving natural capital, biodiversity and ecosystems for people and prosperity lie. In general, analyses also tend to be stronger for issues related to forestry and water, and weaker on issues such as pollution and land degradation. Biodiversity is barely mentioned – despite many of the countries being global biodiversity hotspots - as are the wider benefits of natural capital for livelihoods. The links between nature and resilience are included well in some CCDRs (e.g. Pakistan) and less so in others (Morocco). Issues of inclusion – most frequently Gender, Indigenous Peoples and poverty - are frequently addressed, however the analysis is not yet systematic or comprehensive.

Despite the critical role of ecosystems in economic resilience, most CCDRs lack comprehensive quantitative assessments of nature-related risks and their impact on development, growth and macroeconomic stability. Most assessments are qualitative and the use of quantitative information is patchy and not systematically included in the macroeconomic modelling of each CCDR. An important next step for the World Bank is to move toward more quantitative assessments and/or more comprehensive qualitative approaches.

The CCDRs – when taken together – already provide strong evidence of the risks and opportunities of nature for livelihoods, growth, resilience and development across emerging and developing economies (EMDEs) – and therefore motivate a greater focus on this area in future CCDRs. For example: Malawi, where landscape restoration is vital for resilience and productivity; or Pakistan, where analyses demonstrate how ecosystem protection is essential for the country to deliver its ambitious plan for agricultural transformation; or how improved water management in Morocco can unlock the country’s significant renewables potential and green hydrogen. The current CCDRs further clearly demonstrates how rich many countries are in terms of their natural asset base; for example, the DRC with its hydropower resources enough to serve the whole of Sub-Saharan Africa (outside of South Africa) and vast resources of forests and

valuable critical minerals. Similarly for Brazil, Pakistan and Indonesia. The analyses also clearly show that climate and nature risks compound; amplifying each other. Given the growing influence of the CCDRs, demonstrated by the World Bank’s own analysis, if nature-related risks and opportunities for development are not accounted, this could lead clients and IFIs to misallocate resources and policy priorities.

Figure 1. Evidence on the systemic importance of nature for development in the CCDRs

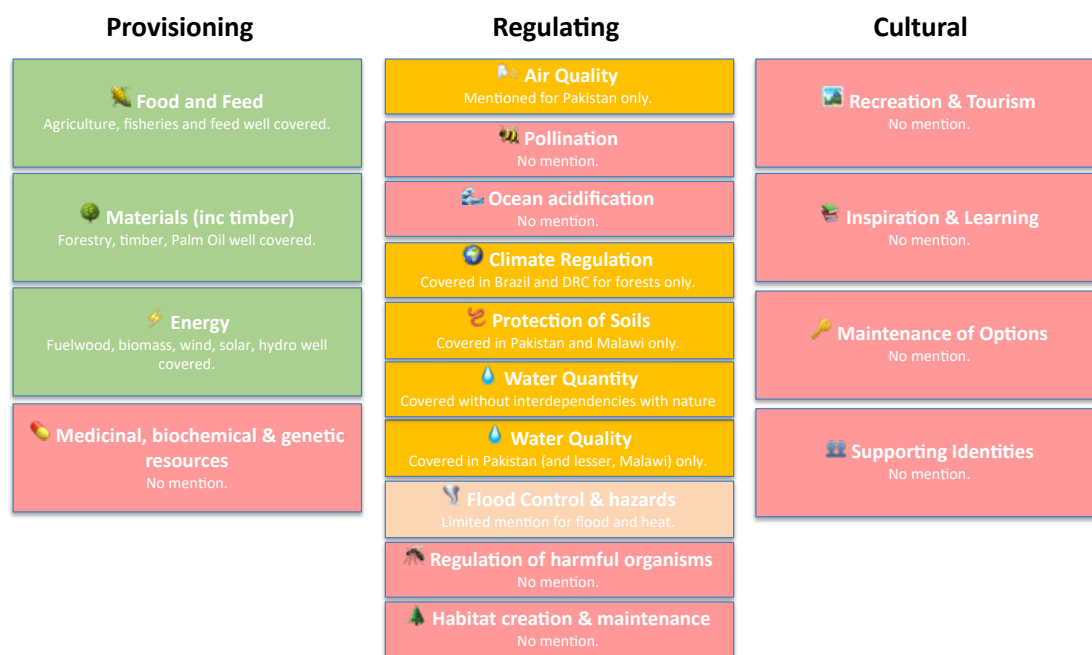


Transboundary risks and interdependencies across countries related to the erosion of regionally and globally important natural systems are not fully captured. Risks to critical systems like tropical forests and major river basins can have important implications for water availability, food prices and climate regulation with sizeable impacts on development prospects and the World Bank’s mission. The DRC CCDR does note that the Congo rainforest is critical to the rainfall patterns across Africa, and the Brazil CCDR notes the global systemic importance of the Amazon for carbon storage and sequestration. However, these issues are not captured in the CCDRs of neighbouring countries, despite clear evidence of their effects. Many EMDEs are sensitive to food price shifts and inflationary pressures, putting them at high risk from regional and global environmental degradation, but this is not fully captured. Major river basins, such as the Ganges, Indus, Irrawaddy, Yangtze and Mekong in Asia are critical to the lives and livelihoods of tens to hundreds of millions of people and are under considerable pressure. Capturing these interdependencies and potential critical risks to development is vital.

The degree of integration of nature into the CCDRs does not seem to have

changed over time (Fig 2). For example, the Pakistan CCDR, which has relatively strong integration was one of the first wave of CCDRs in 2022. This may partly reflect the ordering of countries covered; for example, many of the most forested countries were covered in the ‘second wave’ of CCDRs, such as Brazil, Indonesia and the DRC. But, beyond this, there does not appear to be a clear logic for why some are stronger than others. It could be linked to client awareness and demand or simply the expertise available on the CCDR team or the level of awareness of Task Team Leaders.

Figure 2. Coverage analysis for the categories of IPBES ‘nature’s contribution to people’



The World Bank could provide even better support to its clients – and more fully fulfil its commitments made as part of the 2021 COP26 MDB Joint Statement on Nature and the IDA21 replenishment and Evolution Roadmap reforms - through doing more to integrate nature in a comprehensive and systematic way within the CCDRs, with a focus on risks and opportunities. Even with a narrower focus on climate and development, given the critical importance of nature that is demonstrated by the evidence, there is a need to ensure that nature-related factors are more consistently, coherently and comprehensively incorporated in the CCDRs so that clients receive the best possible information to inform policy and investment choices. This does not necessarily mean that all risks are covered – and inevitably nature will feature more prominently in some CCDRs than others - but that there is a need for a strategic framework to ensure that the key risks and opportunities are identified and prioritized. We recommend that such a framework could build off the World Bank’s

Changing Wealth of Nations approach but also bring in other elements that more fully capture the status and flows of ecosystem services, the dependencies and opportunities, and the impacts on people and planet. We provide initial recommendations on such an approach. Without this, clients could miss important risks and opportunities. It is noted, however, that the CCDRs are only one tool in a large toolbox of diagnostics and research conducted by the World Bank for its clients, including programmes like the Global Program on Sustainability with a strong focus on nature.

While the CCDRs are not and will not be the only channel to discuss the role of nature in development, a fully climate and nature-integrated CCDR would be a powerful tool for clients and for informing World Bank operations and the wider country engagement framework. The World Bank's own analyses (World Bank, 2024) show that the CCDRs are already having both a direct influence on government policy and investments and an indirect influence on the IFI ecosystem, for example the IMF Resilience and Sustainability Facility. Integrating nature into the CCDR could therefore be one important step, alongside others, in helping to better mainstream nature across operations, technical assistance, training and diagnostics at the World Bank, as well as wider diagnostics such as debt sustainability analyses (DSA) and the financial sector assessment program (FSAP). This is not to suggest that CCDR is the only place to integrate nature or that it in any way replaces other tools; different diagnostics have different purposes, and nature is key to several of them. But, integrating nature into the CCDRs could help as one step toward ensuring greater integration across climate, nature and development plans and wider diagnostics. Given the potential influence of CCDRs on policy at country level, integration within the CCDRs could support the development and delivery of coordinated and aligned Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) and National Biodiversity Strategies and Action Plans (NBSAPs) through providing a shared understanding and common approach to risk and opportunity assessment, with the client, within the World Bank, and with the wider ecosystem of stakeholders and IFIs. It can also support opportunities to share lessons and experience on nature mainstreaming with other MDBs, including through the MDB Nature Working Group.

We argue that the World Bank should expand the explicit scope of the CCDRs to include nature, through the lens of nature's contribution to people. To an extent, the question of whether to expand the scope is not relevant as climate and nature are so closely interlinked. But we find that incorporating an explicit focus on nature through the lens of nature's contribution to people (NCP) and development is essential and aligned with the original scope. The NCP lens is consistent with the Kunming-Montreal Global Biodiversity Framework. Learning from the existing

CCDRs is that they have been useful in identifying new risks and opportunities and so impactful in informing financing; explicitly incorporating nature should have the same beneficial impact and enhance awareness and operations at the nexus of nature and development. We see few risks in this approach, given that climate and nature are so interlinked that they need to be considered together – indeed, incorporating nature will strengthen the CCDRs and their impact.

Preliminary recommendations for the World Bank include:

- **Develop an easy-to-use framework for the identification and prioritisation of nature-related risks, drivers, dependencies, impacts and opportunities to incorporate within the CCDRs.** The goal would be to identify which sectors and topics need a ‘deep dive’ - the framework should allow World Bank teams to rapidly assess which factors to prioritize. It would need to be flexible to the context of the country; acting as a simple checklist and set of criteria for which risks and opportunities to assess in depth. The framework used for analysing the CCDRs developed by the authors for this report, which combines aspects of the World Bank’s Changing Wealth of Nations approach, the Ranger et al. Nature Value at Risk framework, and the TNFD LEAP approach, is a starting point.
- **Develop a set of data, tools and models to support the mainstreaming of nature within the CCDRs,** including: augmenting the Changing Wealth of Nations dataset, as described above; investing in improved standardised tools to assess benefits of nature-based solutions and other nature-based interventions rapidly within CCDR, so to increase the ease of integration; develop a basic framework to incorporate natural capital more fully into macroeconomic models used in CCDRs; and providing training and guidance for World Bank staff. This will require research and development – building upon that already underway - and in some cases, approaches will need to account for the current limits of knowledge and data. This toolkit could be shared with clients to support capacity building for Ministries of Planning and Finance.
- **Develop an easy-to-use blueprint for World Bank teams and clients to identify priority policy and finance recommendations relating to nature.** This blueprint should integrate climate and nature policies, including information and plans captured in the new NBSAPs as relevant, to create a strong basis for clients to take an integrated approach. It should also integrate GEDSI considerations, as indicated in World Bank’s Social Inclusion Framework, and guidelines to enable Gender and Social Inclusion in Programs Using Nature-Based Solutions.

It is recommended that these approaches be piloted within two to three countries in 2025, leading to the development of a framework, toolkit and blueprint that could be rolled out in a systematic way from 2026. The pilots also

provide an opportunity to explore how a nature-integrated CCDR can be coordinated with and support wider work on nature mainstreaming, including through the Global Program on Sustainability. COP30 provides an opportunity to publish an initial framework and pilot.

1. Introduction



View from a cable car over Copacabana and downtown Rio de Janeiro . Photo by [F Cary Snyder](#) on [Unsplash](#)

1.1 Background

The UK has made strong commitments to supporting climate and nature action, including the £11.6 billion International Climate Finance pledge between 2021/22 and 2025/26. Of this, at least £3 billion is pledged to protecting and restoring nature and the UK is committed to mobilising finance from all sources to ensure global implementation of the Global Biodiversity Framework (GBF) (UK National Biodiversity Strategy and Action Plan, 2025). Of the UK's overall aid budget, around 40% is allocated to multilateral institutions, including £2.3bn to the multilateral development banks (the largest portion) in 2023 (ICAI, 2025¹).

Multilateral development banks continue to play a central role in the financing of resilience and nature protection and recovery in Emerging Market and Developing Economies (EMDEs). Indeed, the share of finance provided by the MDBs has increased over time. The OECD estimates that multilateral (MDB and ML Fund) biodiversity finance ranged from \$5.7-11.3bn in 2022, more than doubling from the

¹ <https://icai.independent.gov.uk/html-version/how-uk-aid-is-spent>. Accessed 13th April 2025

previous year (OECD, 2022²). However, MDBs do not yet comprehensively report biodiversity finance and OECD estimates these flows reflect a relatively small proportion (3-6%) of total multilateral development finance. By comparison MDBs reported ~\$75bn of climate finance for Low and Middle Income Economies (LMICs) in 2023.

In 2021, the MDBs reiterated their commitment to assisting clients to avoid, minimise and manage environmental and social risks, and to mainstreaming nature into their policies, analyses, assessments, advice, investments and operations, in line with their respective mandates and operating models (World Bank, 2023)³. They made specific commitments to support government clients to revise their National Biodiversity Strategies and Action Plans (NBSAPs), to supporting countries to implement nature-based solutions, and to looking for opportunities to step up nature financing and efforts to mobilise private finance. In terms of World Bank Group (WBG) commitments, nature featured strongly in the IDA 21 (International Development Association 21st cycle) draft documents, for example, including proposals to extend support sustainable management of natural resources, as well as analytics, policies and programs designed to optimise development efforts to ensure that people benefit from nature resources without degrading them (IDA, 2024, pg. 32⁴)⁵. In 2022, the World Bank committed to support its client countries in implementing the Global Biodiversity Framework and the 30x30 Agenda, which aims to protect 30% of land and sea by 2030⁶. Forests and water form two of the World Bank's six global challenge areas. The G7 in 2024 affirmed strong stakeholder support for MDB mainstreaming of nature and alignment of financial flows⁷. In 2025, CBD Decision 16/34 on Resource Mobilisation Decision highlighted the importance of MDBs mainstreaming biodiversity into portfolios, increasing biodiversity investments, and aligning financial flows with the GBF⁸.

The World Bank Group is by far the largest provider of climate finance to developing countries. In November 2024, it reported that 44 percent of lending—\$42.6 billion—

² <https://www.oecd.org/en/about/news/announcements/2024/09/dac-members-hit-a-new-record-on-development-finance-for-biodiversity-in-2022.html> and https://assets.publishing.service.gov.uk/media/671911e8a36621334536b39c/Final_version_of_Biodiversity_Finance_Trends_Dashboard_2024.pdf

³ <https://thedocs.worldbank.org/en/doc/e523c9386dd95f2ec59613310611e1de-0020012021/original/MDB-Joint-Statement-on-Nature.pdf>

⁴ <https://documents1.worldbank.org/curated/en/099060424223583110/pdf/BOSIB-08d2e9ef-f10b-43e6-b676-912fc83146ac.pdf>

⁵ The WBG scorecard includes a result on “Hectares of terrestrial and aquatic areas under enhanced and resilience.

⁶ <https://www.worldbank.org/en/news/feature/2024/05/22/to-grow-strong-grow-green>

⁷ Climate, Energy and Environment CMQ (April 2024) - para 19. <https://www.g7italy.it/wp-content/uploads/G7->

⁸ <https://www.cbd.int/doc/decisions/cop-16/cop-16-dec-34-en.pdf>

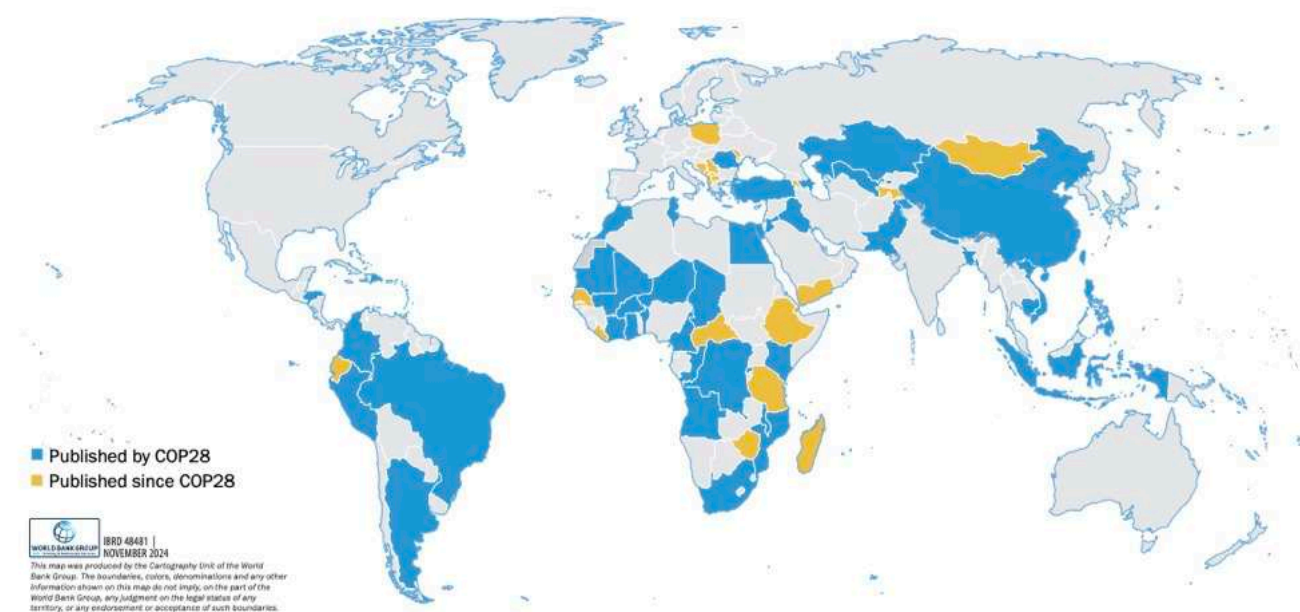
over the last year went toward climate adaptation and mitigation⁹. The World Bank Group Climate Change Action Plan 2021-2025 commits to scale investments in nature as part of transformative action to address climate change and biodiversity loss crises together (WB, 2021)¹⁰. Today, the WBG is also one of the leading financiers of nature (WB, 2022)¹¹. This includes concessional financing from the International Development Association (IDA) which serves the poorest countries and provides crucial funding for high-impact conservation, including for expansion of protected areas and enhancing their effectiveness across key biodiversity hotspots. The World Bank is also the core implementing agency for the Global Environment Facility (GEF) and helps clients access concessional and non-concessional GEF grants, often integrating these into larger sectoral lending. The World Bank also mobilises and manages considerable multi-donor grant resources and concessional funds to strategically to blend, de-risk, and pilot new financing financial instruments that attract private and institutional investors. The World Bank's Global Partnership for Sustainable and Resilient Landscapes (PROGREEN), the World Bank's Blue Economy Program (PROBLUE), and the Global Program for Sustainability (GPS) umbrella trust funds represent nearly US\$500 million of grant resources. In October 2024, the World Bank Group committed to double its agricultural finance commitments to \$9 billion per year by 2030, with a focus on resilience and halting environmental degradation.

In addition to these direct financial flows, the MDBs and the World Bank in particular play a substantial role in shaping wider patterns of public and private investment into nature and adaptation through their awareness raising, technical assistance, capacity building, market reform activities and policy-based lending. The diagnostic tools provided and used by the World Bank can therefore play an influential role in policy, investment and markets across EMDEs. The Country Climate Development Reports (CCDRs) are one such diagnostic tool that plays an increasingly influential role through awareness raising, information provision and supporting the dialogue with countries on their priorities as part of the Country Engagement Framework.

⁹ <https://www.worldbank.org/en/news/statement/2024/11/19/statement-on-climate-finance-accounting#:~:text=WASHINGTON%2C%20November%2019%2C%202024%E2%80%94,toward%20climate%20adaptation%20and%20mitigation>

¹⁰ <https://openknowledge.worldbank.org/server/api/core/bitstreams/19f8b285-7c5b-5312-8acd-d9628bac9e8e/content>

Figure 3. CCDRs covered by November 2024 (WB, 2024)

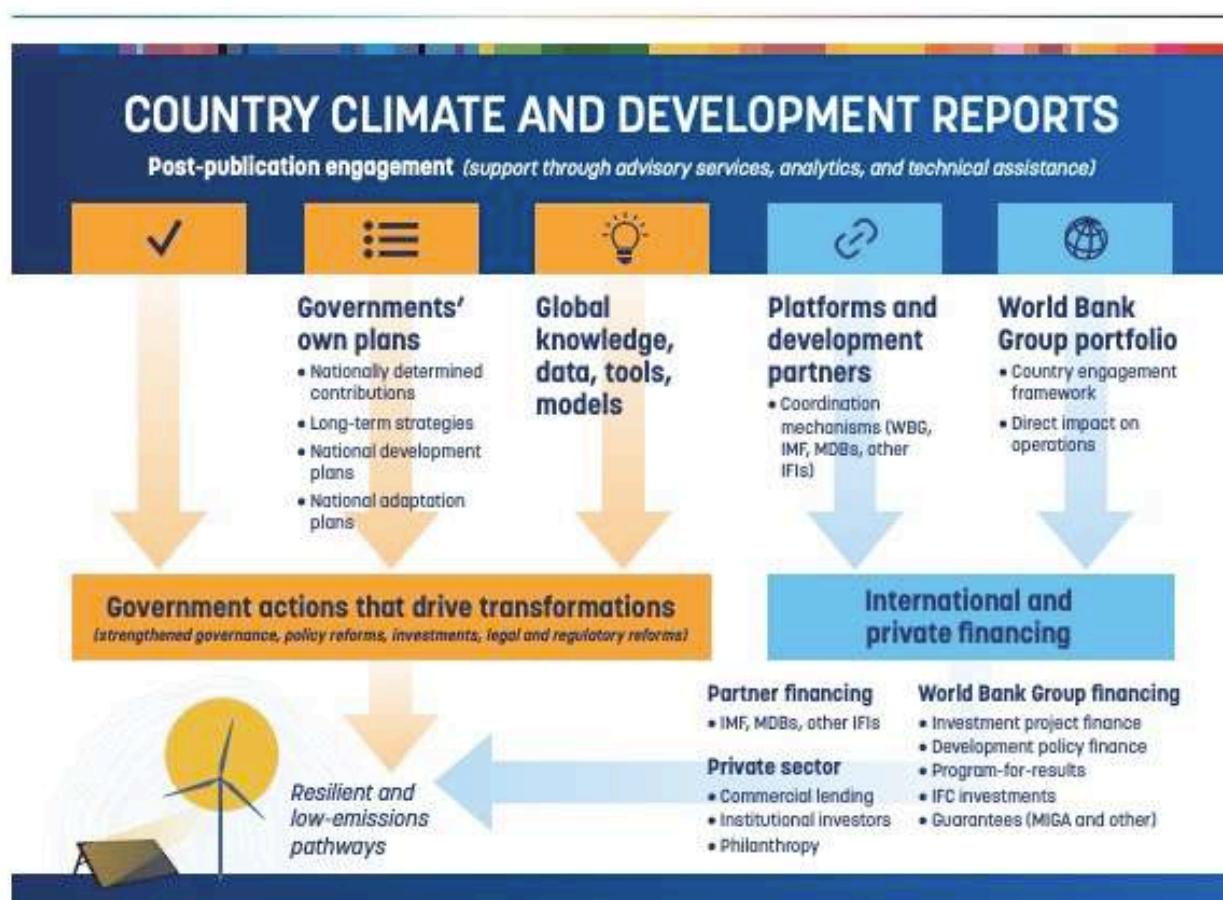


The World Bank Group introduced the Country Climate and Development Reports (CCDRs) in 2022. By the end of 2024, more than seventy countries had CCDRs completed (Figure 3). As of November 2024, the CCDRs cover 60 percent of the population of low- and middle-income countries (LICs and MICs) and 73 percent of their gross domestic product (GDP) (WB, 2024).

According to the World Bank, “this core diagnostic helps countries prioritize the most impactful and urgent actions to boost resilience and adaptation and reduce GHG emissions, while delivering on broader development and sustainability objectives. CCDRs are designed to guide policy priorities and decisions by public and private stakeholders, and to inform World Bank Group priorities at the country level or through its global initiatives” (WB, 2024).

The World Bank CCDRs have already had a measurable direct influence on government policies and action (World Bank 2024). For example, recommendations have been included in national plans and informed dedicated cooperation platforms, such as the Bangladesh Climate and Development Platform—as well as other IFIs, such as the IMF’s Resilience and Sustainability Facility programs, which have been systematically informed by CCDRs. They are also a key input into the World Bank Group’s Country Engagement Framework, including the Country Partnership Frameworks, and other World Bank, IFC, and Multilateral Investment Guarantee Agency (MIGA) operations. Figure 4 illustrates the channels of influence of the CCDRs, including direct influence on government policies and indirect influence via the WBG and development partners.

Figure 4. Channels of influence of the CCDRs (World Bank, 2024).



Given the influence of the CCDRs, the materiality of nature for climate action and development, and the World Bank’s 2021 commitments to integrate nature within its analyses and advice to governments, there is a strong case for nature to be integrated within the CCDRs. In this context, this project responds to a request from the UK Foreign, Commonwealth and Development Office (FCDO) to explore if and how to mainstream nature into the CCDRs of the World Bank.

1.2 Project objectives

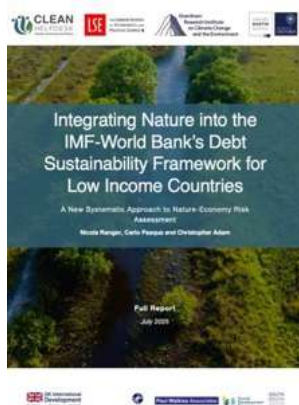
The objective of this project is to assist FCDO and the World Bank to enhance nature related considerations in the Bank’s CCDRs. The project aims to assess the existing CCDRs and provide:

1. An assessment and gap analysis focused on to what extent nature-relevant issues are incorporated in CCDRs, including: risks, dependencies, impacts and opportunities; drivers of nature loss; benefits of avoiding environmental degradation; development and growth opportunities, synergies and trade-offs; international risks; and nature-based solutions and their contribution to development, adaptation and mitigation; analysis of financial needs; and links

between forestry, jobs, mitigation and resilience.

2. Assessment of the extent to which climate and nature-related risks are incorporated into impact assessments including headline Gross Domestic Product (GDP) impact numbers, including nature-related feedbacks.
3. Integration of Gender Equity, Disability and Social Inclusion (GEDSI) aspects of nature
4. A set of recommendations for FCDO and World Bank, including:
 - a) How to correct any omitted risks, impacts, dependencies and opportunities related to nature, including any lack of GEDSI consideration, and that will require an upgraded modelling approach.
 - b) Ensure that the CCDRs reflect the value of natural capital and appropriately prioritize actions through a comprehensive assessment of related risks.
 - c) How CCDRs could support and are coordinated with wider work on nature mainstreaming at the World Bank, including other key analytical, policy and technical assistance tools, and how it could help integrate nature into the wider economic diagnoses and country action planning.
 - d) How the World Bank could pilot a new approach to mainstreaming nature in CCDRs in three countries, including which countries might be most appropriate (e.g. those where Country Partnership Framework is coming up for renewal).
 - e) How can CCDRs support the development and delivery of coordinated and aligned Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) and National Biodiversity Strategies and Action Plans (NBSAPs)?

This report constitutes the final deliverable of the rapid project “Mainstreaming Nature into Country Climate Development Reports (CCDRs)”, conducted over March 2024. This should be read alongside the sister report on [debt sustainability analyses and nature: Ranger et al. 2025](#).



[Read the *Integrating Nature into the IMF-World Bank's Debt Sustainability Framework for Low Income Countries* report on the CLEAN website here](#)

<https://www.clean-helpdesk.org/knowledge-hub/article/6886e3c678a64e1028a3c8def>

2. Background



Muzaffargarh, Pakistan. Photo by [zain raza](#) on [Unsplash](#)

The criticality of nature for development was explicitly recognized in the MDB Joint Statement on Nature, People and Planet (World Bank, 2021) and the IDA21 draft policy commitments. Biodiversity and nature are essential to our very existence, supporting our water and food supplies, our health and the stability of the climate (IPBES, 2024). More than half of global gross domestic product (GDP) is dependent on nature and its services, 44 USD Trillion (WEF, 2020), yet it could also be argued that there is no economy (or indeed, life) without these critical services, such as water, clean air, fertile soils and food (Ranger et al. 2023).

Biodiversity is declining in all regions of the world and at all spatial scales, impacting ecosystem functioning, water availability and quality, food security and nutrition, human, plant and animal health and resilience to the impacts of climate change. The extent and condition of ecosystems has declined in 50% natural ecosystems, including more than 85% of wetland area lost, and an average of 25% species are at risk of extinction (IPBES, 2019). The 2019 Global Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) concluded that fourteen of the eighteen ecosystem services ('categories of Nature's contribution of people') that were assessed had declined since the 1970s. It further concluded that "nature across most of the globe has now been significantly altered by multiple human drivers, with the great majority of indicators of ecosystems and biodiversity showing rapid decline". These drivers

include land-use change, pollution, extraction and climate change.

The COP28 Joint Statement on Climate, Nature and People¹² further states that “*there is no path to fully achieve the near- and long-term goals of the Paris Agreement or the 2030 goals and targets of the Kunming-Montreal Global Biodiversity Framework without urgently addressing climate change, biodiversity loss and land degradation together in a coherent, synergetic and holistic manner, in accordance with the best available science.*” Climate change and nature are intimately interlinked, with degradation of natural assets such as forests and soils acting as a risk multiplier on the impacts of climate change and vice versa (Pörtner et al. 2022). The erosion of natural capital generates significant and long-term risks to society and economies, from increasing the risk and impacts of pandemics, floods and droughts, to undermining water quality and supplies, damaging agricultural production and creating risks to human health (Ranger et al. 2023). History, as well as the science, point to the potential scale of the impacts.

Figure 5. People-Planet-Prosperity Transmission Framework. Source: authors

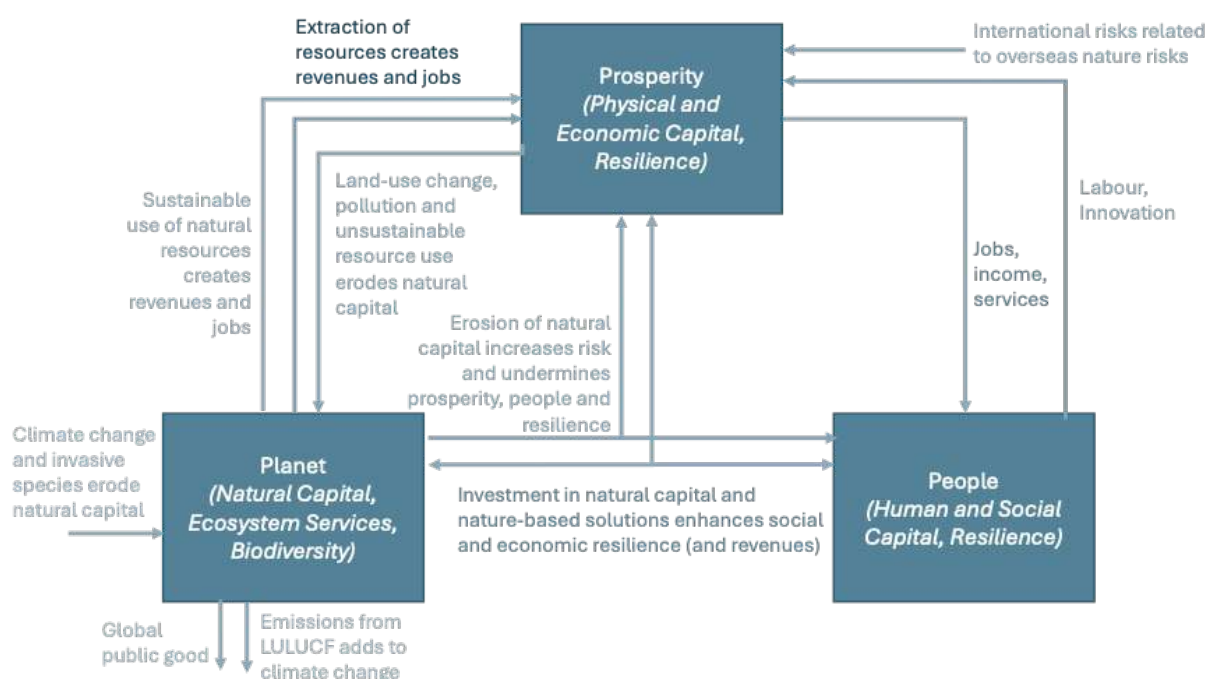


Figure 5 illustrates the interlinkages between nature (planet), people and prosperity at a country level. The extraction or sustainable use of natural resources creates jobs and revenues that build prosperity. However, land-use change, pollution and unsustainable resource use erodes natural capital. This increases risk and undermines prosperity, people and resilience. But investment in natural capital and nature-based solutions enhances social and economic resilience, as well as

¹² <https://www.unccd.int/sites/default/files/2024->

revenues. These processes also have global implications and repercussions. For example, natural capital is also threatened by global climate change and invasive species. Yet, preserving nature brings global public goods and can reduce greenhouse gas emissions. Similarly, the erosion of natural capital internationally can contribute to risk globally, for example, through supply chains and macroeconomic volatility. This simple framework identifies the main transmission channels and is used to assess the inclusion of nature in the CCDRs.

Gender, equality and inclusion issues are also important to assess. It is accepted that the impacts of climate change are not the same for all regions, nor for all people within a country. Vulnerability, in addition to its biophysical determinants, is a product of uneven economic development and multidimensional inequality. The impacts of climate change – as well as the impacts of environmental degradation, are shaped by conditions of vulnerability and exposure to them, they interact with preexisting structural inequities, such as those based on wealth, unequal opportunities, power dynamics, age, health, education, political capacity, gender and ethnicity (Andrijevic, et.al., 2020; Mikaelson & Lager, 2024).

There is a growing recognition of the interconnectedness and interdependent relationship between nature and human existence, health and wellbeing (IUCN, 2020). Women, elderly, indigenous peoples, persons living with disabilities, migrants and other marginalised groups are disproportionately impacted by environmental degradation and climate and excluding them results in less effective and equitable contributions to climate adaptation and mitigation actions. Similarly, different population groups have different relationships with natural resources in terms of access, use, and management. These differences are also reflected in their knowledge of nature and, therefore, in their ability to contribute to inclusive development. GEDSI refers to approaches to ensuring that people of all backgrounds are included and can contribute to NbS that consider the full participation of all local stakeholders and, with appropriate social safeguards, can address various social challenges that generate inequality (CBD, 2022; WB, 2023a). Regarding nature, there is consensus that NbS must have gender equality, disability and social inclusion (GEDSI) at the core of its activities. (WB, 2023a; SPREP, 2024). The Convention for Biological Diversity adopted a Gender Action Plan in 2022, with the purpose of supporting and promoting the gender responsive implementation of the post-2020 global biodiversity framework (CBD, 2022).

3. Methodology



Nagalapuram, Andhra Pradesh, India. Photo by [Vishnu Vardhan](#) on [Unsplash](#)

This section outlines the approach for the project, including how many CCDRs will be sampled, the methodological approach, the frameworks to be adopted and how nature is defined. The methodological approach was discussed with the World Bank and FCDO in January 2025.

3.1 Framing: what we mean by nature

At the outset it is important to be specific on what we mean by ‘*nature*’ in the context of the objective of this project. “Nature” embodies different concepts to different people (IPBES, 2019). This is well illustrated by the IPBES Nature Futures Framework, which provides three perspectives on nature – ‘Nature for Society’, ‘Nature for Nature’ and ‘Nature as Culture’. In this project, we propose to interpret the “mainstreaming of nature” in the context of the various ways by which nature contributes to people (“Nature for Society”). This framing is proposed as it aligns with the people-centred mission of the World Bank to “end extreme poverty and boost shared prosperity on a liveable planet”. To integrate a GEDSI lens, it also draws on the World Bank Group Gender Strategy 2024-2030: Accelerate Gender Equality to End Poverty on a Liveable Planet and the WB Disability Inclusion and Accountability Framework.

The implication of this for this project is that it will assess the mainstreaming of

nature only through the lens of how it contributes to people and prosperity, with a focus on those populations in extreme poverty. This perspective also aligns with nature as a natural asset, providing natural capital. Arguably this approach is also consistent with the Global Biodiversity Framework mission and goals, which place emphasis on benefits to people. A “nature for nature” perspective – i.e. the intrinsic value of nature - could lead to quite a different set of conclusions around mainstreaming nature into the CCDRs, with a more central focus on conservation and protection of species. Definitions in this report are given in Box 1.

Box 1. Definitions

Nature is defined as the natural world ([Dasgupta, 2021](#)) with an emphasis on its living components. Within the context of western science, it includes categories such as biodiversity, ecosystems (both structure and functioning), evolution, the biosphere, humankind’s shared evolutionary heritage, and biocultural diversity. Within the context of other knowledge systems, it includes categories such as Mother Earth and systems of life, and it is often viewed as inextricably linked to humans, not as a separate entity (see “Mother Earth”). ([IPBES, 2019](#))

Natural Resources: Resources which are naturally occurring, including renewable resources such as forests and non-renewable resources such as minerals and which are necessary e.g. to support jobs and provide raw materials that people need to survive, manage local climate impacts and contribute to carbon storage and emissions reductions ([Dasgupta, 2021](#))

Natural assets: Naturally occurring living and non-living entities that together comprise ecosystems and deliver ecosystem services that benefit current and future generations. This stock of renewable and non-renewable natural assets yield flow of benefits to people (i.e. ecosystem services).

Natural capital: The stock of renewable and non-renewable natural assets (e.g. ecosystems) that yield a flow of benefits to people (i.e. ecosystem services). The term ‘natural capital’ is used to emphasize it is a capital asset, like produced capital (roads and buildings) and human capital (knowledge and skills) ([Dasgupta, 2021](#))

Ecosystem services: The flow of goods and services for people produced by ecosystems. These support jobs and provide raw materials that people need to survive, manage local climate impacts and contribute to carbon storage and emissions reductions. The term ‘ecosystem services’ includes: (i) **provisioning services** (e.g. food, freshwater, fuel); (ii) **regulating and maintenance services** (e.g. climate regulation, pollination, soil quality, the flow and purification of water); and (iii) cultural services (e.g. recreation and spiritual enrichment) ([Dasgupta, 2021](#))

Nature’s contribution to people (NCP) (table 1) “are all the contributions, both positive and negative, of living nature (i.e., all organisms, ecosystems, and their associated ecological and evolutionary processes) to people’s quality of life.” (IPBES, 2019, p. 1046).

Biodiversity is defined as the variety of life in all its forms, and at all levels, including genes, species, and ecosystems. The CBD defines biodiversity as ‘the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems’ (Convention on Biological Diversity). (Dasgupta, 2021)

Nature based Solutions (NbS) are ‘actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while providing human well-being, ecosystem services, resilience and biodiversity benefits” (UNEA-5, 2022; IUCN, 2022).

Nature-related dependencies, impacts, risks and opportunities. Dependencies – of the economy/organisation on nature; Impacts – on nature caused, or contributed to, by the Economy/organisation; risks – to the economy/organisation stemming from their dependencies and impacts; and opportunities – for the economy/organisation that benefit nature through positive impacts or mitigation of negative impacts on nature (TNFD 2023).

Nature-related financial risks (NGFS, 2023) “risks of negative effects on economies, financial institutions and financial systems that result from: i. the degradation of nature, including its biodiversity, and the loss of ecosystem services that flow from it (i.e., physical risks); or ii. The misalignment of economic actors with actions aimed at protecting, restoring, and/or reducing negative impacts on nature (i.e., transition risks)”.

Gender equity, disability and social inclusion (GEDSI) refers to approaches to ensure people from all backgrounds, including women and gender diverse people, people with a disability and people facing other forms of marginalisation are included, reasonably accommodated and can contribute to Nature-based Solutions. A GEDSI lens is used to prevent unintended harm, exclusion and further marginalisation of at-risk groups, and to promote their rights, equitable opportunities and benefits (SPREP, 2024).

Gender equality and social inclusion mainstreaming. The process of assessing the implications for everyone (people of all gender identities, sexual and gender minorities (SGM), as well as any disadvantaged groups, on the basis of any factor) of any planned action, including policies or programmes, in all areas and at all levels. A way to make women and other disadvantaged groups’ concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic, and societal spheres – so that everyone benefits equally and inequality is not perpetuated (UK PACT, 2024)

3.2 Rapid deep-dive analysis of six country CCDRs

Six CCDRs were analysed in detail to determine where and how nature is incorporated, based upon the ‘Nature as Society’ framing outlined above. The project timeline does not allow scope to conduct a full independent assessment of nature risks and opportunities for six countries based on the wider literature, so in this rapid assessment, the CCDRs are assessed against a conceptual framework and database of indicators (below). To analyse the gaps in the inclusion of nature-related risks, we adopt the framework of the IPBES Nature’s Contribution to People approach (to assess ecosystem services) and the TNFD framework on dependencies, risks, impacts and opportunities (applied at a broader economy level, rather than for individual businesses or assets). Further, the framework proposed in Figure 5 is adopted to assess the inclusion of various ‘transmission channels’ between people, planet (nature) and prosperity.

The selection of the six CCDRs is facilitated through a rapid construction and analysis of a database of indicators of nature-related risks, impacts, dependencies and opportunities that aims to provide a picture of where the 71 CCDR countries sit relative to each other. For this, we leverage the World Bank’s Changing Wealth of Nations (CWON) dataset, but combine this with other data (drawing upon the World Bank Development Indicators database, the SDG tracking and Ranger et al. 2023) to fill gaps to represent the key dimensions of the IPBES framework. For example, we gain data on renewable and non-renewable capital from CWON, but combine this with other datasets from the World Bank’s World Development Indicator’s database and the SDG database, for example on air pollution, water pollution, greenhouse gas emissions, land degradation, biodiversity indicators. Sector dependency data is taken from Ranger et al. 2023.

This is because CWON captures natural capital (the stock), but to understand risks, information is also needed on flows of ecosystem services and their status, as well as indicators that enable us to capture the impacts on people and the economy and dimensions of transition risks. Sector dependencies capture the dependencies of different economic activities on ecosystem services; for example, agriculture is highly dependent on soil quality and water availability. When combined with information on the sectoral value-add (as well as other relevant variables such as employment and livelihoods) and information on the state of the ecosystem service, this leads to a metric of economic and social risk (see Ranger et al. 2023 for methodology). A shortened version of this dataset is included in table 2.

Table 1. Six selected CCDRs and their rationale.

| | | |
|----------------------------|--|---|
| LOW INCOME | Dem. Republic of Congo [SSA] High %agricultural employment High natural disasters Mining dominant exports High hydropower potential High carbon sequestration potential Forestry, mining, agriculture mix 50% Africa’s forests and water Regarded as mega biodiverse | Malawi [SSA] High %agricultural employment High natural disasters Land degradation |
| LOWER MIDDLE INCOME | Morocco [MENA] High agricultural land area High water stress Tourism, agriculture, energy Reducing biodiversity intactness | Pakistan [SOUTH ASIA] Very high water stress Loss of mangroves |
| UPPER MIDDLE INCOME | Brazil [LATAM] Forestry, agriculture, mining High LULUCF emissions Agriculture and forestry, mining Large Forests Mega biodiverse Reducing biodiversity intactness | Indonesia [SE ASIA] High forest area Mineral rents Declining mangroves Biodiversity hotspot and declining BII |

The six selected CCDRs are summarized in Table 1. The CCDRs were chosen to provide diversity over: (a) regions; (b) income levels; (c) dimensions of natural capital and ecosystem services that are most relevant; (d) size/population; (e) dependence on imports and exports; and (f) economy structure. Ten countries were initially selected and then the final six chosen in consultation with the World Bank and FCDO (with the World Bank making the final decision).

3.3 High-level screening for all 71 CCDRs to date

The deep-dive analysis is combined with a wider high-level screening of the nature-related dependencies, risks and opportunities, including GEDSI dimensions, across all 71 economies included in CCDRs to date, using the same framework as for the deep-dive analysis. The screening analysis utilises a Natural Language Processing (NLP) techniques to analyse the 71 reports using keywords derived from the frameworks and the six deep-dive assessments. The analyses are spot checked for ten CCDRs to validate.

3.4 Recommendations

The final step will seek to identify actionable, feasible and pragmatic steps for how the gaps identified can be addressed, with reference to those points outlined in the ToR. As far as possible, these recommendations for next steps will be tested and co-developed with the World Bank and FCDO. Based on preliminary discussions with the World Bank, there is interest in recommendations that could support the World Bank to identify: (1) how existing datasets and evidence¹³ could be used to tell a backward and forward-looking story on the linkages between nature, poverty-alleviation, resilience and jobs for a country, coupled with a simple quantitative assessment framework that could be applied across countries based upon existing data; (2) explore how a forward-looking analysis could be constructed that is consistent with the current CCDR approach, where possible using quantitative models focussed on at least one critical ecosystem service per country; (3) the development of templates to identify opportunities that could be easily applied across all countries.

¹³ policysupport.org - [Co\\$tingNature](https://www.co$tingnature.org/) and Oxford-GCA Resilient Planet toolkit

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------|----|-----|------|------|------|-----|------|------|------|------|---------|-------|------|------|-----|------|------|------|------|-------|--------|------|-------|---|-----|
| Kiribati | IDA | 27 | .. | 42.0 | 21.4 | .. | 9.0 | 19.4 | .. | .. | .. | 212752 | .. | 48.6 | .. | 0.0 | .. | 0.0 | 12.2 | .. | 0.0 | 12 | 0.0 | .. | 0 | 3.6 |
| Kosovo | IDA | 24 | .. | .. | .. | .. | 3.0 | 5.6 | .. | 1.8 | .. | 0 | .. | 41.5 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 0 | .. |
| Lebanon | IBRD | 16 | 0.1 | 58.2 | 6.2 | 6.1 | 2.5 | 3.1 | 17.8 | 4.6 | .. | 3388 | 41.1 | 32.8 | .. | 0.0 | 6.9 | 0.0 | 18.0 | 10.8 | .. | 1382 | 0.4 | -10.7 | 1 | 5.5 |
| Liberia | IDA | 30 | 0.5 | 14.2 | 76.1 | 51.8 | 12 | 27.9 | .. | .. | .. | 32692 | 0.2 | 50.9 | 50.0 | 0.0 | .. | 17.8 | 40.1 | 8.9 | -1.8 | 82226 | -0.4 | -2.4 | 1 | 4.6 |
| Malawi | IDA | 23 | 0.6 | 50.2 | 29.7 | 73.3 | 8.2 | 18.0 | 9.8 | .. | 6.6 | 180508 | 15.9 | 50.6 | .. | 0.0 | 0.2 | 10.2 | 23.0 | 26.8 | .. | 30817 | -1.7 | -1.7 | 0 | 4.3 |
| Maldives | IDA | 28 | 0.0 | 30.0 | .. | 14.5 | 3.5 | 6.0 | 23.6 | .. | .. | 0 | 17.7 | 33.9 | .. | 0.0 | 0.1 | 0.0 | 16.8 | .. | .. | 8 | 0.0 | 0.0 | 0 | 2.2 |
| Mali | IDA | 24 | 0.4 | 31.7 | 32.9 | 67.3 | 11 | 25.3 | 14.0 | .. | 7.3 | 125376 | 7.4 | 58.5 | 70.0 | 2.0 | 0.1 | 5.5 | 65.0 | 9.3 | .. | 132960 | 0.0 | -0.8 | 0 | 7.0 |
| Marshall Islands | IDA | 27 | .. | .. | .. | .. | 7.1 | 14.6 | .. | .. | .. | .. | .. | 44.6 | .. | .. | .. | .. | .. | .. | 0.0 | .. | 0.0 | .. | 0 | 3.9 |
| Mauritania | IDA | 24 | 0.1 | 38.5 | 24.8 | 45.6 | 6.3 | 13.8 | 18.7 | .. | .. | 0 | 15.7 | 45.9 | .. | 0.0 | 45.7 | 3.3 | 85.1 | 13.6 | 5.8 | 4216 | -1.6 | 0.3 | 0 | 4.8 |
| Moldova | IBRD | 24 | 0.1 | 77.4 | 25.4 | 50.9 | 3.7 | 7.1 | 13.1 | 6.7 | 10.2 | 12650 | 20.7 | 40.0 | .. | 0.0 | 1.5 | 0.3 | 28.8 | .. | .. | 3444 | .. | -1.3 | 0 | 3.1 |
| Mongolia | IBRD | 11 | 0.1 | 84.3 | 27.4 | 48.6 | 4.5 | 9.5 | 16.6 | 0.0 | 7.0 | 0 | 3.6 | 44.4 | .. | 3.0 | 35.6 | 5.2 | 21.4 | 23.4 | .. | 142639 | 0.0 | 5.8 | 0 | 2.9 |
| Montenegro | IBRD | 19 | 0.1 | .. | 11.3 | 10.3 | 3.3 | 5.9 | .. | .. | .. | 1701 | .. | 33.4 | 88.1 | 0.0 | .. | 0.0 | 25.8 | 6.7 | .. | .. | 0.0 | 2.6 | 0 | 2.8 |
| Morocco | IBRD | 20 | 0.3 | 68.7 | 10.7 | 45.8 | 4.1 | 8.0 | 13.7 | 5.6 | 25.8 | 1399151 | 60.5 | 44.8 | .. | 0.1 | 8.7 | 0.3 | 26.3 | 5.1 | .. | 55065 | 0.1 | -1.0 | 1 | 3.7 |
| Mozambique | IDA | 23 | 0.4 | 47.6 | 19.0 | 83.0 | 8.6 | 19.2 | 14.0 | 99.5 | .. | 391089 | 1.0 | 48.2 | .. | 0.0 | 17.3 | 6.2 | 20.3 | .. | -5.0 | 411880 | -0.6 | -1.4 | 1 | 6.9 |
| Nepal | IDA | 24 | 0.5 | 29.6 | 38.2 | 73.4 | 7.5 | 16.1 | 11.9 | 98.4 | 17.1 | 97822 | 8.4 | 41.9 | .. | 0.0 | 0.2 | 1.2 | 57.9 | 8.3 | .. | 57808 | 0.0 | -0.3 | 1 | 4.1 |
| Niger | IDA | 24 | 0.6 | 29.2 | 36.6 | 79.7 | 11 | 27.2 | 38.5 | 0.0 | 7.2 | 46649 | 3.6 | 55.6 | 80.0 | 0.0 | 40.7 | 7.3 | 86.5 | 3.3 | .. | 13281 | -1.1 | -0.4 | 0 | 7.3 |
| North Macedonia | IBRD | 18 | 0.1 | 48.6 | 10.1 | 24.7 | 3.5 | 6.6 | 12.1 | 17.2 | 7.7 | 2107 | 16.7 | 41.6 | 57.9 | 0.2 | 8.8 | 0.4 | 38.4 | .. | .. | 9576 | 0.4 | -6.3 | 0 | 2.5 |
| Pakistan | Blend | 21 | 0.3 | 47.6 | 25.4 | 45.2 | 7.4 | 15.8 | 13.8 | 25.2 | 5.5 | 655245 | 105.9 | 48.4 | .. | 0.0 | 0.2 | 1.8 | 59.2 | 3.3 | -17.2 | 45113 | -0.9 | -1.3 | 0 | 6.4 |
| Peru | IBRD | 22 | 0.0 | 17.9 | 8.1 | 38.2 | 3.2 | 6.0 | 11.7 | 81.2 | 10.5 | 5820795 | .. | 43.5 | 25.4 | 1.3 | 35.5 | 3.0 | 70.0 | 8.5 | -3.2 | 752978 | -0.2 | -1.2 | 1 | 4.9 |
| Philippines | IBRD | 26 | 0.2 | 37.7 | 13.9 | 37.1 | 4.1 | 7.8 | 7.0 | 17.2 | 8.5 | 4237750 | .. | 49.7 | .. | 0.2 | 1.6 | 0.5 | 31.5 | 49.4 | -2.7 | 73093 | 0.5 | -2.7 | 1 | 5.4 |
| Rwanda | IDA | 26 | 0.4 | 74.0 | 31.2 | 89.2 | 8.6 | 19.1 | .. | .. | .. | 37038 | 5.0 | 49.6 | 78.8 | 0.0 | .. | 5.0 | 31.4 | 27.0 | .. | 2870 | 0.4 | 2.2 | 1 | 3.5 |
| Senegal | IDA | 34 | 0.3 | 46.9 | 16.4 | 49.4 | 5.6 | 11.8 | 23.3 | 0.0 | 11.6 | 459463 | 8.5 | 48.2 | 44.4 | 0.0 | 4.8 | 2.3 | 69.4 | 17.6 | 0.3 | 88532 | -0.5 | -11.4 | 0 | 4.1 |
| Serbia | IBRD | 19 | 0.2 | .. | 14.7 | 26.7 | 2.5 | 4.1 | 9.3 | 35.1 | .. | 7942 | .. | 40.1 | 47.8 | 0.0 | 15.6 | 2.3 | 31.3 | 4.2 | .. | .. | 0.0 | -24.9 | 0 | 2.9 |
| South Africa | IBRD | 17 | 0.1 | 80.9 | 2.6 | 20.3 | 1.9 | 2.5 | 4.7 | 0.5 | 9.0 | 613435 | 40.8 | 38.5 | 52.1 | 0.7 | 10.6 | 3.7 | 24.4 | 29.3 | 3.0 | 177781 | -0.2 | 8.8 | 1 | 4.0 |
| St Vincent and Grenadines | Blend | 24 | .. | 17.9 | 8.5 | 16.8 | 3.7 | 6.7 | 26.7 | .. | .. | 2141 | 9.8 | 33.2 | .. | 0.0 | 0.1 | 0.0 | 23.4 | .. | .. | 285 | .. | .. | 0 | 2.4 |
| St. Lucia | Blend | 24 | 0.1 | 23.3 | .. | 21.1 | 1.8 | 2.1 | 22.9 | .. | 74.1 | 1516 | .. | 29.5 | .. | 0.0 | 0.0 | 0.0 | 23.0 | .. | .. | 210 | .. | 0.0 | 0 | 2.7 |
| Tajikistan | IDA | 23 | 0.2 | 32.7 | 25.1 | 61.2 | 7.3 | 16.2 | 10.2 | 98.4 | .. | 2585 | 81.2 | 53.1 | .. | 0.6 | 53.9 | 1.0 | 37.0 | .. | .. | 4100 | 0.3 | -14.2 | 1 | 3.9 |
| Tanzania | IDA | 26 | 0.4 | 38.4 | 26.2 | 83.0 | 8.0 | 18.0 | 15.6 | 86.4 | 28.0 | 125972 | 10.7 | 48.2 | .. | 0.2 | 0.4 | 3.8 | 20.2 | .. | .. | 536700 | .. | -6.4 | 1 | 4.3 |
| Tunisia | IBRD | 27 | 0.3 | 61.5 | 10.0 | 20.5 | 4.1 | 7.9 | 8.2 | 0.6 | 23.1 | 145453 | 66.0 | 44.0 | 84.9 | 0.0 | 1.5 | 3.7 | 27.5 | 6.1 | .. | 6679 | 0.2 | 21.8 | 0 | 3.2 |
| Türkiye | IBRD | 21 | 0.1 | 52.6 | 10.0 | 36.0 | 2.9 | 5.2 | 3.9 | 24.7 | .. | 785816 | 31.2 | 45.0 | .. | 0.0 | 2.6 | 0.2 | 22.5 | .. | .. | 201484 | .. | -7.2 | 1 | 4.9 |
| Tuvalu | IDA | 27 | .. | 66.7 | 16.3 | .. | 4.7 | 11.1 | .. | .. | .. | 11296 | .. | 16.0 | .. | 0.0 | .. | 0.0 | 6.2 | .. | 0.0 | 10 | 0.0 | .. | 0 | 2.7 |
| Uganda | IDA | .. | 0.3 | 62.6 | 27.5 | 81.2 | 7.8 | 17.2 | 14.1 | .. | .. | 702581 | 3.0 | 53.1 | 0.0 | 0.0 | 4.5 | 12.0 | 33.2 | .. | .. | 31630 | -1.6 | 18.7 | 1 | 6.5 |
| Uzbekistan | Blend | 24 | .. | 62.7 | 30.1 | 25.7 | 7.3 | 16.2 | .. | 12.5 | .. | 144103 | 153.1 | 55.5 | .. | 0.2 | .. | 13.0 | 30.7 | 26.1 | .. | 29615 | 1.0 | .. | 1 | 3.0 |
| Viet Nam | IBRD | 23 | 0.3 | 28.2 | 24.5 | 65.3 | 4.5 | 9.3 | 5.2 | 54.8 | .. | 8187492 | 15.9 | 52.3 | .. | 0.0 | 0.4 | 9.7 | 27.2 | 23.4 | -4.7 | 117841 | 0.9 | -1.9 | 1 | 3.7 |
| West Bank and Gaza | .. | 18 | .. | 77.8 | 9.7 | 14.1 | 3.2 | 5.6 | 23.3 | .. | 10.6 | 5307 | 40.1 | 38.1 | .. | 0.0 | 2.6 | 0.0 | 26.1 | .. | .. | 91 | .. | .. | 0 | 5.9 |
| Yemen | IDA | 26 | .. | 44.8 | 14.5 | 49.6 | 6.7 | 14.6 | .. | 0.0 | .. | 131317 | 161.1 | 43.7 | .. | 0.0 | .. | 42.3 | 45.0 | 17.5 | -18.4 | 5490 | 0.0 | .. | 1 | 8.0 |
| Zimbabwe | Blend | 24 | 0.2 | 39.1 | 15.7 | 65.5 | 3.5 | 6.7 | 7.7 | 45.7 | .. | 47948 | 35.7 | 48.2 | 83.3 | 0.8 | 8.7 | 3.9 | 20.3 | 9.2 | .. | 183660 | -0.3 | 1.9 | 1 | 4.4 |

4. Analysis of deep-dives



Bweremana, République démocratique du Congo. Photo by [Dieuvain Musaghi](#) on [Unsplash](#)

4.1 Systematic inclusion of nature-related risks, dependencies, drivers and impacts

- To what extent are nature-related risks, dependencies, impacts and opportunities incorporated in the CCDRs?
- Drivers of nature loss e.g. Land-use change, pollution, exploitation of natural resources, invasive species, and the impacts on different groups of people

Most of the six CCDRs reviewed did include some information on nature-related risks, but this was patchy. There was no systematic approach, and, in most cases, risks were included in an unstructured and fragmented way. There was also a general lack of quantitative information; analyses tended to be qualitative. Using the IPBES ‘natures contribution to people’ categories as a framework, the CCDRs were analysed to extract all information relevant to nature-related risks. Our approach to risk follows that of the literature on economic and financial risks of nature and biodiversity loss, which separates risk in chronic (gradual factors) and acute (shocks) risks, and where environmental degradation can be either a direct risk (e.g. soil degradation leading to reduced agricultural output and food insecurity), indirect (e.g. vulnerabilities to food price shocks from

environmental degradation elsewhere) or an amplifying factor on other risks (e.g. deforestation can increase flood risk and increase drought risk)¹⁴.

The types of nature-related risks included varied significantly by country, this is to be expected, albeit in some cases key risks were clearly missing. An example is Morocco, which included a lot of information on water-related risks, but did not mention issues around soil quality and pollution that are captured in the wider literature. For water, the Morocco CCDR clearly highlights the significant risks to agriculture, energy and wider macroeconomic volatility, that could contain opportunities e.g. in green hydrogen. The Brazil CCDR similarly focusses on water, and the risks to productivity in power (particularly hydropower), mining and agriculture. It also highlights the link between loss of vegetation cover and heat risks, citing evidence that native vegetation loss cost to soy industry US\$99 per hectare. Nature-related risks are well covered in the Malawi CCDR, which notes that land degradation is a major risk, especially soil erosion. It estimates 80% of Malawi's land area needs restoration, with major risks to agriculture and water infrastructure. Increased runoff and soil erosion is impacting water quality and undermining resilience.

The DRC CCDR is weak on nature-related risks, despite outlining significant risk drivers including forest loss, land degradation and poor natural resource management. It also fails to highlight documented health risks related to mining practices in DRC. Conversely, the Pakistan CCDR is comprehensive, identifying risks related to air pollution, water quality (bacterial and nitrate contamination), water scarcity, epidemics and mitigation of disaster risks. It highlights, for example, that high air pollution levels alone create a significant drag on economic performance equivalent to approximately 10 percent of GDP and shorts expected lifespans by 4.3 years. It too also provides detailed analyses on water risks, concluding that demand could increase by 60% leading to intersectoral trade-offs, including declining water for irrigation that could derail much needed increases in agricultural productivity.

Indonesia is similarly quite comprehensive, discussing health and economic risks due to smoke and fires, urban heat stress partly links to removal of vegetation, rising water scarcity, land subsidence and increased vulnerability to flooding. Health damages from smoke associated with forest clearing for agriculture were estimated to cost US\$23.5 billion over 2008-2017, and the CCDR reports that the 2019 fires cost US\$5.2 billion (0.5% GDP). In most cases, however, the inclusion of nature was largely qualitative or where quantitative information was provided this was not systematic.

¹⁴ See, for example, Ranger et al. 2023, which is itself based on the framework developed by the Network for [scorpion-macro-criticality-nature-finance](https://www.networkfor-scorpion-macro-criticality-nature-finance.org/)

Besides Pakistan (and to an extent Malawi), the focus of discussion on risks was limited to those closely associated with climate (e.g. water), this means that other important risks to productivity and health are missed. This includes issues around soil quality, contaminated water, industrial pollution and its impacts on people and fisheries, invasive species (e.g. locusts), regulation of crop, human and livestock diseases, and pollinators, as well as the drivers of more significant risks such as anti-microbial resistance and the links between forest clearing and disease. While these are arguably not climate risks, they are all risks happening in parallel that are compounding with climate change, leading to higher risks and increasing the difficulty of meeting net zero goals. The Morocco CCDR lack of mention of soil quality issues and challenges of pollution of coastal waters are two examples of non-climate risks that could increase climate-risks to fisheries and agriculture. Not including these could underplay the extent of risks facing countries, lead to mis-prioritisation of resources, and mal-adaptations. The Malawi CCDR is strong on soil erosion issues. It was also surprising that risks to tourism were missing in some of the CCDRs.¹⁵ For Morocco, for example, tourism constitutes more than a quarter of receipts from exports. Risks related to biodiversity loss are also ignored, for example the linkages to pharmaceuticals, innovation, public health as well as tourism and recreation.

In some cases, while there was little coverage of nature-related risks, these issues were instead framed as opportunities. For example, rather than discuss the risks associated with mangrove loss, the Indonesia CCDR discusses the opportunity for halt mangrove loss for aquaculture development. This growth framing is no-doubt important, but it could mean providing an incomplete picture of the risks, e.g. to flood control in this case. The DRC CCDR similarly says relatively little about the economic risks of deforestation but does focus on the opportunities from avoiding deforestation. For example, it reports that DRCs 143 million hectares of forest are valued at \$6.4 trillion and could generate up to \$400 billion a year from stored carbon and ecosystem services, including flood avoidance and timber production.

Discussion on nature-relevant drivers, such as deforestation, land-conversion or growing water demand, was strong in most of the six CCDRs assessed, albeit they were not necessarily labelled as such and again there was no clear framework to include them. Arguably, the drivers were prioritized from a climate risk lens, so there was little mention of themes like antimicrobial resistance and invasive species. The most comprehensive example is Pakistan, which included a detailed overview of issues related to soil degradation, loss of vegetation cover, peri-urban expansion, fertiliser use, overextraction of water, degradation of wetlands, fuel wood harvesting and unmanaged grazing. It notes that Pakistan

¹⁵ Note that tourism risks do appear more in other CCDRs, e.g. for small island states.

ranks among the top 10 countries in the world most impacted by the loss of biodiversity and ecosystem services. Pakistan is endowed with considerable renewable natural capital, equivalent to an estimated 13-15% per capita wealth but much of it is at risk. The CCDR explicitly recognizes that ecosystem and landscape restoration is a foundational necessity that needs to be a policy and investment priority.

In Brazil, the pressures of economic development are noted as the main driver, particularly associated with the agriculture and extractives sectors (oil, gas, mining). The Brazil CCDR discusses the uptick in deforestation in recent years, associated with illegal logging, land grabbing and agriculture, including cattle ranching. The Malawi and DRC CCDRs notes the important drivers including deforestation linked to household use of biomass (firewood and charcoal) – more than 95% of households in both countries. Unsustainable agricultural practices and increasing population pressure on land are also noted for Malawi. The interlinkages between climate change and ecosystem services comes across in each of the CCDRs, as does the important role of fiscal policies – including tariffs, subsidies and incentives - in driving behaviour and leading to large-scale erosion of ecosystem services, as well as the role of weak institutions.

Only one of the six CCDRs reviewed included any mention on the impacts on biodiversity. Water and forests (followed by peatlands and soils) are the best covered forms of natural capital. The Pakistan CCDR, for example, briefly discusses the harmful impacts of pesticide application on biodiversity and how high surface water withdrawals and polluted return flows affect river ecology. There is no discussion of how these biodiversity impacts feedback on development and growth. Surprisingly, DRC notes only in a footnote that it is one of the world's most mega-biodiverse countries and this is not mentioned at all for Brazil. .

The six reports recognize that the poorest households, that rely on agriculture and informal labour, will be disproportionately affected by climate change (land degradation, drought and floods), which will further reduce their incomes. In Pakistan, the agri-food system, contributes over 40 % of Pakistan's labor force, and more than 63 % of Pakistan's people reside in rural areas; this system presents extreme climate vulnerability linked to the loss of natural vegetation cover and the associated regulation of water flows.

In DRC, an analysis on the link between poverty, social exclusion and climate change states that people who are dependent on rainforest and biodiversity resources, face increased poverty due to droughts and heatwaves. In some regions of Morocco, farm households rely on internal migration to mitigate the consequences of climate change. Men tend to migrate first, and a high prevalence of women relative to men in the agricultural sector makes them more vulnerable to the effects of climate change, such as drought and land degradation. In Morocco,

lack of access to jobs constitutes the most powerful force for social exclusion, the problem is particularly acute for women and the youth. At just 22 percent, Morocco's female labor force participation is among the lowest in the world. In Malawi, a 2018 study found that temperature-related shocks affected overall household consumption, food consumption, non-food consumption, and caloric intake more in households in which the land was managed solely by women than in those households in which the land was managed by men or managed jointly. In Brazil, land degradation affects mainly indigenous people that rely on forest and nature for their survival.

4.2 Positive opportunities for livelihoods, growth and resilience, including NbS

- To what extent do CCDRs capture the benefits of avoiding environmental degradation for resilience? i.e. resilience built via avoiding pollution (beyond just deforestation). Does this consider building resilience for marginalised groups?
- To what extent do CCDRs explore development and economic growth opportunities related to nature? Does this consider who is able to access these opportunities and who might face barriers in accessing these opportunities?
- To what extent do CCDRs address the synergies and perceived trade-offs between nature, adaptation, mitigation and inclusive development? What are the economically and financially viable solutions?
- What Nature based solutions feature in the analysis and how do they contribute to development, mitigation and adaptation goals.
- For forested countries, what are the links between forestry, jobs, mitigation and resilience (including for marginalised groups) and how does this link to key ecosystem services?
- Beyond forestry, what other types of natural capital are present?

Each of the six CCDRs notes the benefits of nature-based solutions (NbS) to an extent, albeit there is wide variation in depth and little systematic or quantitative analysis. The types of NbS included vary by country, but includes natural flood management, regenerative agricultural approaches and natural water management. Such interventions involve nature restoration and sustainable management of resources, but nature itself is not the primary outcome (the service to society is the focus). Surprisingly, the Brazil CCDR barely mentions NbS, while the DRC CCDR includes a fuller discussion and quantification of the benefits of land

and forest restoration for flood mitigation. The Pakistan CCDR has a strong focus on NbS and emphasizes that building resilience through NbS is an important priority for them – this is cited to be due to learning from the 2022 devastating floods and the recognition of the need for agricultural transformation as part of development. Focal areas include water management, regenerative agriculture and livestock management. It mentions the Ten Billion Tree Tsunami Program (TBTP), a four-year project that will have the quadruple benefits of natural capital restoration, carbon sequestration, and livelihood improvements, especially for poor households, and also recommends that NbS should be prioritized in all urban areas. The Indonesia CCDR discusses opportunities for flood mitigation e.g. through restoration of agricultural lands (surprisingly references to NbS for urban flooding are weak) and urban cooling (Figure 6). There is no mention of NbS in the Morocco CCDR.

Figure 6. Indonesia CCDR. Analysis connecting urban temperatures to vegetation levels.



Most of the six CCDRs do include some discussion on the benefits of avoiding environmental degradation for resilience and go beyond purely avoiding deforestation, but there are gaps in coverage. The Brazil CCDR strongly underlines the benefits of preserving natural capital for resilience, and highlights the risks of a major tipping point in the Amazon that could lead to the collapse of that ecosystem with losses of \$184 billion for Brazil alone. The DRC CCDR emphasizes the benefits of reversing landscape degradation and forest loss for resilience and productivity. The Pakistan CCDR recognizes the benefits of increasing soil organic carbon for its water holding capacity and resistance to extremes. The Malawi CCDR clearly sees forest/land restoration as core to climate resilience, highlighting, for example, the Bonn Challenge pledge to restore 4.5 million hectares. However, the CCDR notes that NBS projects have not yet been fully integrated or funded at scale. It emphasizes the importance of landscape restoration (e.g., soil and water

conservation, agroforestry, forest management) for increasing resilience. Watershed rehabilitation (protecting upstream forests, wetlands) is noted as critical for reducing flood risk, ensuring reliable hydropower, and improving water availability.

All of the CCDRs place emphasis on the development and growth opportunities related to natural capital to some extent, but there does not appear to be a systematic approach and this area could be strengthened to provide more guidance to WB clients¹⁶. Forestry and water are the dominant focal areas. For example, the DRC CCDR stresses that DRC is endowed with huge renewable and non-renewable natural capital with the potential for very significant benefits for livelihoods, jobs and growth. This includes 143 million hectares of forest are estimated to be able to generate up to \$400 billion a year from stored carbon and ecosystem services, including flood avoidance and timber production. Further it highlights that sustainable management of forest resources can lead to job creation; in DRC every \$1 invested in landscape and forest restoration, yields a gain of \$15 benefits by 2050. Forests provide timber, food production, fuelwood, erosion and sedimentation control, regulate and purify water.

The Indonesia CCDR references the benefits of halting mangrove loss for aquaculture development and the benefits for smallholder palm oil producers of increasing yields in ways that can enhance livelihoods and reduce forest loss, as well as presenting quantitative analyses on the economic co-benefits of peatland restoration and avoiding deforestation (Figure 6). Indonesia recently committed to restore 600,000 hectares of mangroves by 2024 – the largest such effort to date in the world.

The Brazil CCDR notes the opportunities for inclusive growth through forest-based economic activities (but gives no details). Economic opportunities related to hydropower and renewables are highlighted for Morocco, Brazil and DRC – DRC alone could provide power for the whole of sub-Saharan Africa (except South Africa) from its hydropower potential.

Morocco enjoys a generous endowment in sources of renewable energy with the potential for significant revenues through exporting electricity, if the constraint imposed by water scarcity can be addressed.

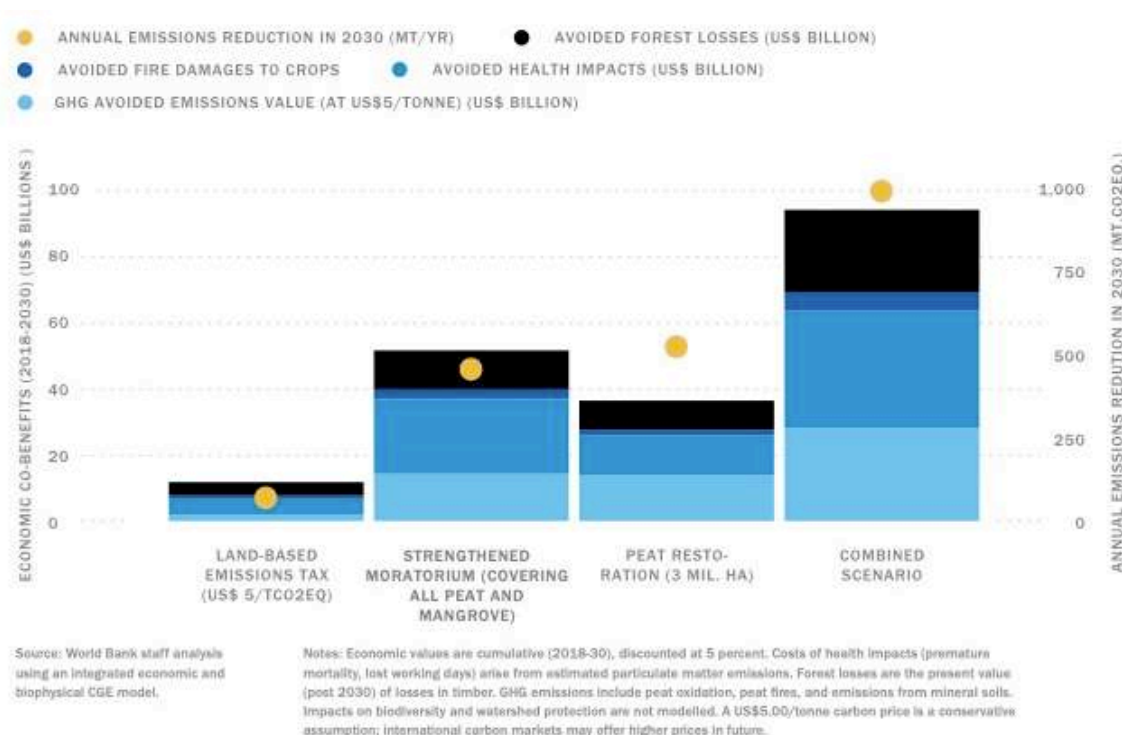
Pakistan similarly is endowed with considerable renewable natural capital, which through more careful natural resource management could yield significant livelihoods benefits in agriculture. It analyses how a shift to a climate smart regenerative agri-food system thus has enormous potential for enhancing farm incomes and reducing rural poverty. These are strong examples and through a greater and more systematic focus on such opportunities the CCDRs. The Malawi CCDR clearly establishes the role of natural capital in livelihoods, given that

¹⁶ We note CCDRs have evolved over time with bottom-up learning.

agriculture accounts for 70% of employment and is highly sensitive to land degradation and water scarcity.

In general, there is little focus on the potential trade-offs between natural capital, development and livelihoods. The Brazil CCDR does include an in-depth discussion of deforestation.

Figure 7. Indonesia CCDR: Economic co-benefits from policies to reduce land-based emissions



Inclusive development is a central topic in the CCDRs, however, there is no roadmap to show how disadvantaged populations can benefit from opportunities for nature-related economic growth and development. The recommendations are rather general, emphasizing the needs to strengthen support to local community governance engagement (local representatives, women, and socially excluded groups) to increase resilience and low-carbon growth efforts (DRC). The inclusive approach can be achieved by prioritizing the provision of resources, capacity-building, and direct funding opportunities to local communities for effective climate action, but there are many barriers identified.

In Pakistan, the increasing feminization of agriculture is set to pose new challenges unless there is a clear pivot toward providing unbiased agricultural services to women, such as training in agronomic practices and technologies, gender sensitive and female-led extension services, formal land titles, and access to credit and markets.

In Malawi, women and girls face significant disadvantages that hinder their ability to

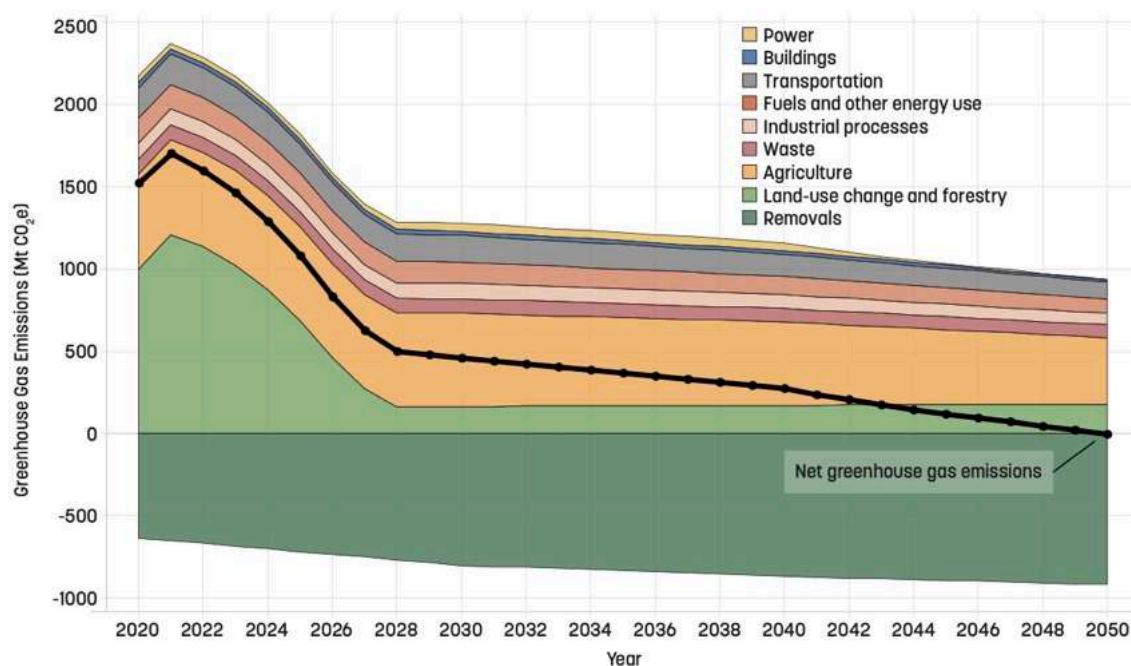
accumulate human capital and rise out of poverty: high fertility rate, high levels of teenage pregnancy and marriage, and inadequate access to reproductive healthcare and family planning are key factors. In DRC and Morocco land degradation lead to increasing internal migration and climate change displacement, resulting in deepening impoverishment and social exclusion. IPLC development, or the development of Indigenous Peoples and Local Communities is included in some of the CCDRs, particularly Brazil, DRC and Pakistan.

All the six CCDRs include examples of synergies and trade-offs between nature, adaptation and mitigation but it is not explicit or systematic and arguably the focus on decarbonisation. By far the dominant and most systematic consideration of the CCDRs is the link between nature and mitigation. Specifically, the greenhouse gas emissions reductions related to land-use, land-use change and forestry (LULUCF), but also the potential for carbon sequestration and the prospects of raising revenues through carbon markets. For each of the countries besides Morocco, agriculture, forestry and other land-use (AFOLU) together provide a major share of greenhouse gas emissions (greater than 40%). However, in most cases (beyond Indonesia and Brazil) absolute emissions are small, so this does raise a question of whether the strong focus on the linkages between nature and decarbonisation in all of the CCDRs is warranted, and if the focus might instead be on wider synergies between nature and development. Brazil's natural ecosystems are estimated to remove 600Mt CO₂e from the atmosphere per year (Figure 8). The Indonesian government as part of its FOLU Net Sink 2030 plan plans to restore 2.7 million hectares of peatlands, rehabilitate 5.3 million hectares of degraded forestlands, and continue progress in reducing deforestation and forest degradation rates. This plan is also expected to deliver major co-benefits for biodiversity, soil and water management.

The Brazil and DRC CCDRs note the important non-renewable capital – critical minerals – within their territories and the opportunities of the green transition. Beyond carbon, several of the CCDRs note the nexus between water, energy and development. In Morocco, water is posing a constraint on the country's ability to exploit its generous endowment of renewables and phosphate reserves. Overexploitation of groundwater (estimated at 30%) linked to population growth and economic development has contributed to water stress, yet unconventional water resources are energy intensive. In Brazil, the expected increased demand for water for irrigation is expected to result in growing competition with hydropower. The land-natural capital trade-off is also highlighted for Brazil, where economic development in the agricultural and extractives sectors has been the largest driver of environmental degradation. Growing demand for manganese linked to green transition, much of which has occurred in the state of Pará, has resulted in illegal mining, including on Indigenous territories in the state. The pressure on indigenous

peoples' lands is compounded by other factors that facilitate land grabbing: the slowdown in the demarcation of indigenous lands and in the creation of conservation units. Evidence shows that mining activities have caused significant deforestation, both within and outside mining lease boundaries. It also describes how deforestation in the Amazon is negatively impacting rainfall patterns across large parts of Brazil, and the loss of native vegetation in the Cerrado where the main aquifers are located, is increasing aridity and leaving water bodies unprotected. An area that is surprisingly missing is discussion around the trade-offs between increased demand for **critical minerals** – of which Brazil and DRC are particularly rich (but also relevant to Morocco for phosphorus) – and environmental degradation, in particular the health and livelihood impacts for local people. The Malawi CCDR notes the wrong alignment between land restoration, resilience and productivity.

Figure 8. Brazil CCDR: Brazil GHG emissions and removals by sector, 2020-2050



Source: World Bank analysis done for CCDR.

To summarize, Table 3 presents an analysis of the coverage of ecosystem services, using the IPBES framework. As described above, the best coverage relates to energy and to a lesser extent materials (timber, palm oil), food and feed related to natural capital (and regulation of hazards). It is unsurprising that the ‘cultural’ contributions of nature are less well covered given the less direct linkages to economic development (though important for local communities, particularly indigenous communities), but the gaps in the coverage of regulating services provided by nature could be problematic and indicate that the analyses may be missing key risks and opportunities.

Table 3. Analysis of coverage across IPBES' Nature's Contribution to People

| Category | Nature's Contribution to People | |
|--------------|---|--|
| Provisioning | Food and Feed | Agriculture, fisheries and feed well covered. |
| | Materials (incl. timber) | Forestry. Timber. Palm Oil well covered |
| | Energy | Fuelwood. Biomass. Wind. Solar. Hydro well covered |
| | Medicinal, biochemical and genetic resources | No mention. |
| Regulating | Air Quality | Mentioned for Pakistan only |
| | Pollination | No mention. |
| | Ocean acidification | No mention. |
| | Climate Regulation | Covered in Brazil and DRC for forests only |
| | Protection of Soils | Covered in Pakistan and Malawi only |
| | Water quantity | Covered in all but with a climate lens, but non-climate factors/risks not fully considered in analysis |
| | Water Quality | Covered in Pakistan (and lesser, Malawi) only |
| | Flood Control and regulation of other hazards | Limited mention for flood and heat |
| | Regulation of Organisms Detrimental to Humans | No mention |
| | Habitat Creation and Maintenance | No mention |
| Cultural | Recreation and Tourism | No mention |
| | Inspiration and Learning | No mention |
| | Maintenance of Options | No mention |
| | Supporting Identities | No mention |

4.3 International connections – risks and regional and global public goods

- To what extent do CCDRs address the potential for international risks associated with climate and nature (e.g. global commodities shocks, changing in demand etc)?

International risks related to nature loss are largely absent in the CCDRs. Some CCDRs do note generic vulnerabilities to global trade, supply chains and macroeconomic conditions and these same vulnerabilities will apply to nature-

related risks. For example, Indonesia and Brazil face exposure to commodity risks related to palm oil and minerals respectively. Morocco's and DRC's susceptibility to global food price shocks is raised. Discussion on international trends tends to focus more on the opportunities associated with non-renewable natural capital as part of the net zero transition – i.e. mining (Malawi, DRC, Brazil) and green hydrogen (Morocco). There is no mention of linkages to wider geopolitical, instability or security related issues.

Recognition of the importance natural capital assets as a global public good is limited to the major forest countries. While CCDRs are designed to focus at country-level, when looking across the CCDRs, missing the global public goods provided by systemically important natural systems can mean that risks of major vulnerabilities and tipping points for countries are missed. For example, the DRC CCDR highlights the importance of its forests for the climate of the region; the forests of DRC are estimated to provide 50% of the rainfall that falls in the surrounding areas; this risk is not recognized in other CCDRs dependent on the Congo rainforest for their water and climate. The CCDRs also highlights that the Amazon and Cerrado similarly play a crucial role in the region. Little further detail is given. The Brazil CCDR does highlight the potential risks of a tipping point in the Amazon, but surprisingly only discusses the impacts on carbon and ignores the major effects of the global climate and water cycles noted in the literature. Other forms of global public goods are ignored, e.g. global food security, protection from diseases and epidemics and damaging environmental pollution of both oceans, air and land. While it is difficult for individual CCDRs to capture such risks when looking at only one country, the World Bank can play a key role in more strongly highlighting interdependencies.

4.4 Integration of nature into policy and finance analyses

- How do policy frameworks, including NDCs and NAPs, incorporate nature?
- What is the analysis of financing needs?

Recommendations related to natural capital do feature in the policy analysis of all the six CCDRs to an extent, but it is not present in all CCDRs. Very few linkages (if any) are drawn between climate and biodiversity policy frameworks. For example, issues of natural capital are central in the CCDRs for Brazil, Pakistan (water and landscape restoration), Indonesia (forestry, peatlands, mangroves and landscape restoration), DRC (forestry and peatlands), Malawi (landscape restoration) and Morocco (focus on water). The updated Nationally Determined Contribution (NDC) and the National Adaptation Plan (NAP) of Malawi

identify restoration of forests and degraded lands and natural resource management as core mitigation-adaptation strategies, as do the main policy frameworks (MGDS III, Malawi 2063).

The DRC CCDR discusses the inclusion of land and ecosystem degradation in the NAPA and that the 2022-2026 NAP includes forestry, biodiversity and water management. The Morocco CCDR discusses Morocco's ambitious reforestation program (Forêts du Maroc 2020-2030), albeit only from a mitigation perspective, and Plan Maroc Vert, involving large-scale expansion of drip irrigation.

The Brazil CCDR includes a lot of discussion on policy linked to natural capital, including the roles of legislative and judiciary frameworks in protecting the Amazon and the need for strengthened institutions and monitoring. The 2022 NDC calls for a strengthening of the forest code (zero illegal deforestation, restoring 12 mha of forests by 2030, and enhancing sustainable forest management systems), sustainable biofuels and strengthening the Low Carbon Agriculture Program (ABC Plan), restoring 15 mha degraded pasturelands by 2030 and enhancing 5mha integrated cropland-livestock-forestry systems.

The Indonesia CCDR discusses several existing commitments related to natural capital, including the protection of mangroves (noted above), but also the moratoriums on new licenses for forest conversion in primary forests and peat, together protecting 66 million hectares and the governments commitments around reforming land rights.

Pakistan has probably the greatest focus on natural capital in its CCDR, reflecting strong government prioritisation of NbS. It recognizes that ecosystem and landscape restoration is a foundational necessity that needs to be a policy and investment priority. For example, without it, the natural capital required to sustain the agri-food transformation necessary to unlock development will not exist. High priority adaptations in the NDC 2021 incorporate natural capital: 'Recharge Pakistan Program' (including enhancing water recharge at six sites in the Indus and strengthening vulnerable ecosystems) and expanding protected areas. Chemical fertilisers are a key focus of the policy discussion, as well as water and environmental protection. It notes that the Better Cotton Initiative (BCI) has helped 400,000 BCI-licensed farmers (30 percent of cotton farmers) to save 15 percent of irrigation water and reduce pesticide use by 10–15 percent. Also, densification of secondary cities is a way to boost growth, reduce climate risks, reduction land-conversion and improve livelihoods. It further focusses on the importance of reforming regulation to eliminate distortions in groundwater management that lead to unsustainable exploitation of groundwater resources.

Carbon markets feature as the primary proposed nature finance mechanism in several of the reports. For example, the Brazil CCDR notes the significant

opportunities related to carbon markets. Brazil is the fourth largest global seller of Certified Emissions Reductions (CERs) and third largest country for registered CDM project activities, as well as a main player in voluntary carbon markets. The Article VI mechanism could increase flows in the coming decades to Brazil (estimated at \$300bn to \$1trillion globally by 2050). This is similarly a feature of the DRC CCDR. The Indonesia CCDR does discuss carbon sequestration but does not focus on carbon markets, but rather on reducing the countries own emissions. The Malawi CCDR notes opportunities to finance forest/land restoration from international demand for carbon offsets. It finds that land restoration investments will create opportunities for carbon credits but will require targeting investments in the watershed to optimise carbon capture. Analysis done for this CCDR has shown that the potential value of additional carbon sequestered that could be linked to the voluntary carbon markets ranges from US\$24.8 million to US\$74.3 million per year if Malawi meets forest/land restoration targets (depending on the global carbon price).

Only one of the CCDRs – DRC – provides details on financing needs related to natural capital and opportunities for nature finance (beyond carbon markets). It reports that restoring and conserving forest and landscapes could cost DRC \$3.19 bn by 2030, including \$234 million a year for clean cooking (important for avoiding deforestation). This landscape restoration ‘aspirational scenario’ includes restorative and integrated land management. It also discusses opportunities for financing, including for global public goods for funds and voluntary carbon markets, but also forest bonds and blue bonds. The Brazil CCDR also provides explicit estimates of ecosystem and landscape restoration costs. It identifies pasture recovery, plantation forestry, and natural forest restoration as a key investment category. The estimated additional investment needs are R\$124.8 billion capex (2022–2030) and R\$89.2 billion opex (2022–2030) (R\$244.2 billion (2022–2050). These investments are projected to generate significant revenues from recovery of pastures, forest plantations, and forest restoration: –R\$218.2 billion (2022–2030) and –R\$597 billion (2022–2050) (negative values reflect net gains from revenues exceeding costs). Beyond DRC, other CCDRs do hint at nature finance mechanisms, but do not give a comprehensive account. The Brazil CCDR does not provide detailed discussion on modalities of nature finance; notes a potential role for payment for ecosystem services. Similarly, Malawi CCDR urges the use of public-private partnerships – e.g. in watershed restoration, reforestation and sustainable charcoal production - and payment for ecosystem services. No mention in Indonesia or Morocco.

In all the reports, nature-related risks are absent from any financial risk assessment or discussion of green/sustainable finance frameworks (which again, tend to focus more on carbon and transition issues). This is a considerable missed opportunity. Making countries aware of how to incorporate nature into developing green and sustainable finance frameworks – or at least that

this is an option to be explored - is a low hanging fruit. For example, the Pakistan CCDD highlights the need and opportunity to strengthen green finance frameworks, but no with mention of nature. It notes that the adoption of globally accepted environmental and social risk management (ESRM) systems is very low, and there is a lack of institutional capacity at the regulatory, sectoral, and corporate levels. It recommends Guidelines and mandating their adoption to allow the banking sector to develop much-needed ESRM framework.

The importance and opportunity through valuing natural capital to foster development is recognized, though most discussion is around carbon sequestration as the main value. This is true for DRC, for example, which focuses on forests, peatlands and carbon, yet the wider report gives many examples of the wider values of DRC's rich natural capital for livelihoods and resilience. The importance of valuing water also quite strongly features in multiple CCDDs – e.g. Morocco and Pakistan – with discussion of needs to realign tariff structures and subsidies. The value of soils and links to subsidies (e.g. for chemical fertilisers) also features in Pakistan. The Brazil CCDD notes that making forest protection compatible with economic development requires a recognition of the public-goods nature of natural forests, where the value of ecosystem services considerably exceeds the private exploitation values. It notes, for example, the potential opportunity through performance-based financing that can help generate a political economy more conducive to forest protection.

The importance of managing environmentally damaging subsidies is highlighted in all the reports, albeit in some cases only for fossil fuels. For example, the Morocco CCDD only focusses on fossil fuel subsidies, while the wider report does note implicit subsidies linked to water tariffs and their environmentally damaging implications. CCDDs for Brazil and Pakistan do include a more comprehensive analysis. For example, in Brazil, taxes, subsidies and credit schemes promote extensive agriculture and carbon intensive practices, e.g. cattle ranching. The Pakistan CCDD notes the large and unproductive subsidy regimes in the energy, agriculture, and irrigation sectors, which underlie the chronic fiscal stress faced by the country. It describes that the agri-food system is awash with inefficient, costly, inequitable subsidies that are an economic burden and create a distorted incentive structure, which plays a significant role in the sector's poor performance. In recent years, direct and indirect subsidy support to agriculture and irrigation in Punjab and Sindh has amounted to about US\$2.2 billion to US\$2.7 billion in public spending per year. This includes direct subsidy programs, tax relief for inputs, import and export subsidies, and revenue gap financing. Subsidy programs disincentivise water conservation and can incentivise greater use of fertilisers and over intensive agriculture damaging soil quality.

4.5 GEDSI Consideration

In the CCDRs there is broad recognition of the differentiated impacts of climate change on different regions within each country and on different population groups, but there is a gap in the linkages between GEDSI and Nature. Further, the criteria for differentiation are not always described: gender, age, income or ethnicity. Gender and women are the GEDSI dimensions most present in the reports, except for Brazil, where the emphasis is greater on indigenous communities. Disability as an issue for social inclusion is only mentioned in the DRC and in Indonesia, to a lesser extent. The Morocco report emphasizes the importance of considering youth most strongly. The concepts of inclusive development, followed by inclusive growth, are the most frequently used concepts in the reports to summarize the social inclusion approach. The recognition of disproportionate impact on vulnerable groups is not always reflected in the proposed actions.

There is no uniformity in the way the reports address GEDSI. Multiple exclusion and economic factors influence climate impacts, such as where people live, their livelihoods, their health, education, and skills, and their life stage. These have been stated by WB in previous evaluations of the reports (WB, 2024). In all cases, the objectives are a just transition and inclusive growth and development models. However, there are geographic, social, environmental, and political differences that modify the impacts of climate change and must therefore be considered in adaptation and mitigation proposals. Hence the importance of a GEDSI analysis in the reports.

There are opportunities to strengthen the GEDSI and nature dimension in the CCDRs. There are methodologies developed by the World Bank and other organisations that support the elaboration of GEDSI analyses within NbS, and the design of projects that clearly establish this link and can be very useful; among others, the World Bank's guidance note on Integrating Gender and Social Inclusion in Nature-Based Solutions (WB, 2023a) . Within the Global Biodiversity Framework, targets are established that precisely link the dimensions of Nature, social inclusion and gender. Targets 22 and 23 clearly establish a GEDSI approach for representation and participation in decision making, access to justice and information and the whole implementation process of the framework. In addition, at COP 22 was approved the new Gender Plan of Action (2022–2030) under the CBD. It outlines a range of indicative actions to address the persistent gaps in capacity development, collection, and analysis of sex disaggregated data, reporting, and financing related to gender mainstreaming in the implementation of the Convention on Biological Diversity and promote the gender-responsive implementation of the Global Biodiversity Framework. This plan is an entry point for the cross-cutting

integration of gender issues and intersectionality, which addresses different forms of exclusion.

4.6 Nature-aware quantitative impact and macroeconomic modelling

- To what extent is the relationship of climate and nature-related risks incorporated into impact assessments including headline Gross Domestic Product (GDP) impact numbers?
- To what extent and how are nature-related feedbacks are considered and integrated which could-significantly amplify climate impact estimates?

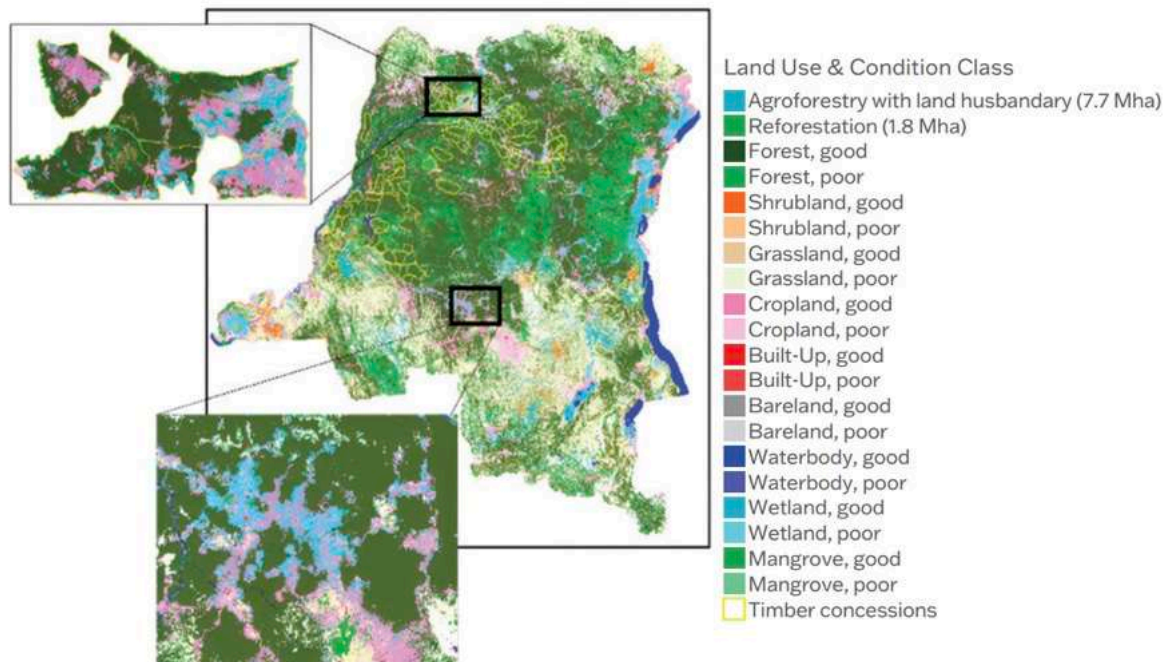
In none of the CCDRs is nature fully integrated within the quantitative modelling. However, several of the CCDRs do attempt to include aspects of natural capital, or more commonly nature-related drivers, in their analyses – in particularly related to changes in demand for and supplies of ecosystem services – most commonly water. The level of sophistication, focus and comprehensiveness is highly varied. In the Indonesia and Brazil CCDR, changes in demand for land, for example, are incorporated in the specification of the land-related scenarios considered. The macroeconomic model used in Brazil quantifies the impact of scenarios including forested land and mining exports. Scenarios assume changes in sectoral growth, productivity and demand. It finds, for example, an increase in global food demand would increase GDP but at the expense of natural forests and would depress mining (due to competitiveness of exports). Assumed increase in productivity of manufacturing would increase forested land by reducing competitiveness of extractive sectors and agriculture, as well as lower emissions.

The DRC analysis is the most advanced of the six countries. This explores, for example, how irrigation can boost agricultural production while avoiding expansion into forests and ecosystems and not impacting water scarcity. It also models how changing water demand will impact on water resources, including for hydropower, and includes a forest restoration scenario to estimate the ecosystem services benefits of investment in landscape and forest restoration, and the benefits for flood risk mitigation. It also conducts modelling of the links between mining and growth but does not account for potential nature-risks or impacts in this analysis and conducts spatial analyses on priority areas of ecosystem restoration (Figure 9).

The Malawi CCDR similarly incorporates land degradation within its modelling of the economic losses from climate change and finds that by 2050 the combined effect of land degradation and climate change could increase losses by almost 25 percent. Modelling of the impacts of flood, drought and heat in Pakistan do not include scenarios related to environmental degradation (despite these being highlighted in

the report).

Figure 9. DRC CCDR (Spatial distribution of restoration priority areas in the REST 2030 scenario



Source: Bela Modelling Team, CCDC DRC in collaboration with European Space Agency-Climate Change Initiative

Note: Purple areas indicate the 7.7million ha recommended for agroforestry interventions on existing croplands and rangelands, and green areas indicate the 1.7million ha to be reforested/managed to meet the country's REDD+ commitment. Red and yellow are areas that need additional policy actions and forest protection enforcement to prevent further predicted deforestation by 2030 under BAU

None of the six CCDRs fully capture the potential feedback and amplified impacts between nature, climate, poverty alleviation and prosperity. While a full comprehensive assessment of these linkages is likely beyond the scope of the CCDRs, the analyses above to demonstrate clear gaps that could mean impacts are underrepresented and opportunities not fully explored in the quantitative modelling. The materiality of these factors, and an appropriate framework to include them in the analyses, requires further exploration.

5. Widening the analysis: screening of 71 CCDRS



Malawi. Photo by [Abrahan Echeverria](#) on [Unsplash](#)

The results of the screening analysis of 71 CCDRs are consistent with the deep dives and reveal substantial variation in the integration of nature-related considerations (table 4). For example, while certain aspects, such as social risks and drivers of nature loss, receive significant attention, others remain underrepresented. The methodology for the screening assessment is detailed in Annex 2. In interpreting these findings it is important to note the limitations of Natural Language Processes (NLP) approaches, specifically that while the results have been validated by a human reader, even sophisticated NLP algorithms are not able to detect all the nuances that a human reader can, and also that the analysing is bundling issues together for feasibility, so the granularity of the assessment is less than in the deep dives. This analysis therefore should be interpreted as an expansion of the deep-dives geographically but cannot replace the precision and robustness of that assessment.

Areas of strong coverage:

Several nature-related topics, particularly **social risks related to nature**, and **drivers of nature loss** have the highest average inclusion scores in the screening analysis of all CCDRs, demonstrating strong and consistent inclusion across the seventy-one CCDRs. Many reports emphasize land-use change, pollution, and

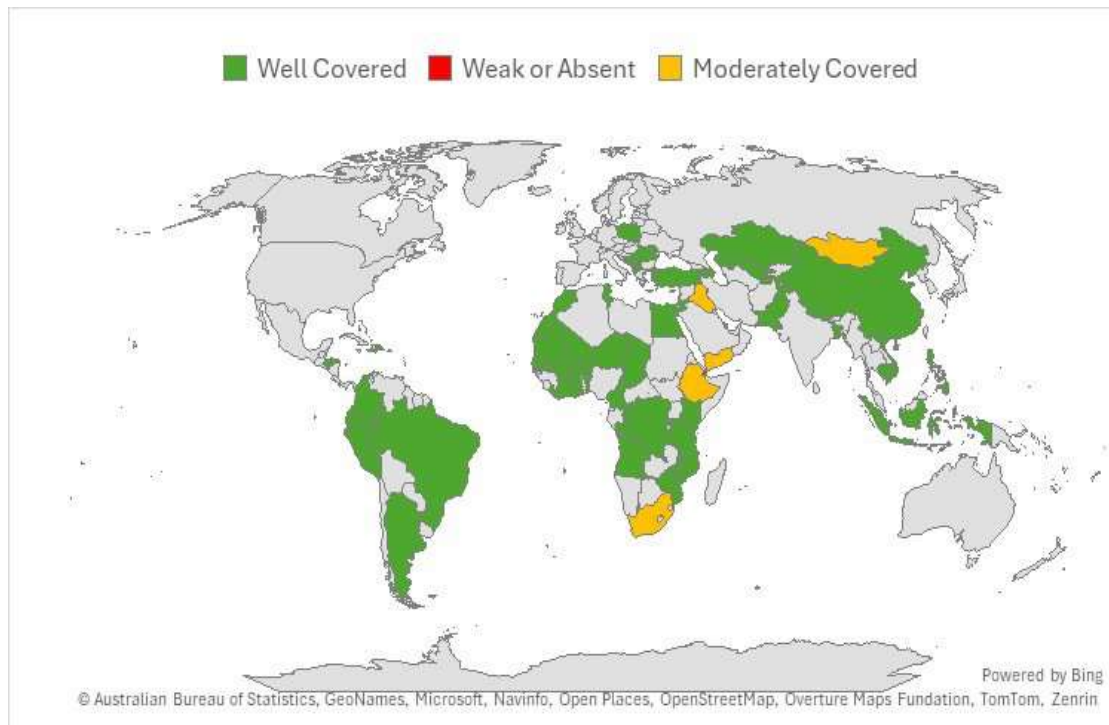
over-exploitation as primary drivers of environmental degradation, reflecting a clear understanding of pressures on natural ecosystems. For example, in Benin, deforestation is largely driven by agricultural expansion and fuelwood consumption, impacting soil erosion and water retention. Similarly, Cambodia has one of the highest rates of deforestation in the world, with major biodiversity losses. Coverage of economic aspects of nature risks is weaker, in line with the findings of the deep-dive analysis.

Also, **trade-offs** and **resilience benefits** are mentioned in many CCDRs, but the approach is not comprehensive or systematic. Only a few CCDRs discuss the role of nature in resilience-building beyond deforestation. Grenada highlights that nature-based solutions (NBS) provide multiple co-benefits, though their economic value is often underrepresented in decision-making. Saint Lucia and Dominica discuss nature-based solutions for cooling cities and mitigating extreme heat, but economic viability assessments remain limited. The Maldives acknowledges the trade-offs between coastal protection and tourism development, though discussions on inclusive benefits are minimal.

Finally, discussions around **vulnerable groups** and **GEDSI** are generally well covered albeit not explicitly for nature. For instance, in China, agricultural communities face increased water stress due to climate change, disproportionately affecting rural livelihoods. Indigenous People and Local Communities are included in most CCDRs, albeit the specific risks and opportunities related to nature (versus generic issues) is weaker.

Figure 10. (top) Vulnerable Groups and GEDSI Integration in CCDRs, (bottom) Nature drivers





Areas of moderate coverage:

Several key areas, including **nature impacts, financial viability and NbS integration**, show moderate coverage in the screening analysis. While some reports provide meaningful discussion, some lack depth and consistency in addressing these aspects. Several reports also highlight the **opportunities of a nature-based economy**. For example, Albania notes that climate change adaptation can create job opportunities in tourism and agriculture. Vietnam has a well-established system for Payments for Ecosystem Services (PFES), demonstrating how natural capital can directly support economic growth.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|-------|--------|--------|--------|--------|--------|-----|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Congo | Yellow | Green | Green | Red | Green | Yellow | Green | Yellow | Red | Yellow | Red | Green | Red | Yellow | Red | Red | Red | Red | Yellow | Green | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Red | Red | Yellow | Yellow | Red | Green | Yellow | Red | Red | Red | Green | | |
| Kiribati | Yellow | Green | Yellow | Yellow | Green | Green | Green | Red | Red | Yellow | Red | Green | Red | Yellow | Red | Red | Red | Red | Yellow | Yellow | Red | Red | Red | Yellow | Yellow | Yellow | Red | Red | Yellow | Yellow | Red | Yellow | Red | Green | Red | Red | Red | Green | | |
| Romania | Yellow | Green | Yellow | Red | Green | Yellow | Green | Green | Red | Red | Red | Green | Red | Yellow | Red | Red | Red | Red | Yellow | Red | Yellow | Red | Red | Yellow | Yellow | Red | Red | Red | Green | Yellow | Yellow | Red | Yellow | Red | Red | Red | Yellow | Yellow | | |
| Rwanda | Yellow | Green | Yellow | Yellow | Green | Yellow | Yellow | Red | Red | Red | Green | Green | Yellow | Red | Red | Red | Red | Red | Red | Green | Red | Yellow | Yellow | Yellow | Yellow | Red | Red | Red | Red | Yellow | Yellow | Green | Red | Red | Red | Red | Yellow | Yellow | | |
| Saint Lucia | Yellow | Green | Green | Yellow | Yellow | Green | Green | Green | Red | Red | Red | Green | Yellow | Green | Red | Red | Red | Red | Yellow | Yellow | Red | Red | Red | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Green | | |
| Saint Vincent and the Grenadines | Yellow | Green | Green | Yellow | Yellow | Green | Green | Green | Red | Red | Red | Green | Yellow | Green | Red | Red | Red | Red | Red | Yellow | Yellow | Red | Red | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Green | | |
| Senegal | Yellow | Green | Yellow | Red | Green | Green | Green | Green | Red | Yellow | Red | Green | Yellow | Green | Yellow | Red | Red | Red | Red | Green | Yellow | Red | Red | Yellow | Yellow | Yellow | Green | Yellow | Yellow | Yellow | Yellow | Yellow | Green | Red | Yellow | Red | Red | Green | | |
| Serbia | Yellow | Green | Yellow | Red | Green | Green | Yellow | Green | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Yellow | Red | Yellow | Red | Red | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Yellow | | |
| South Africa | Yellow | Green | Yellow | Red | Green | Green | Green | Green | Red | Red | Red | Green | Red | Yellow | Red | Red | Red | Red | Red | Yellow | Red | Red | Red | Yellow | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Yellow | | |
| Tajikistan | Yellow | Green | Green | Red | Green | Green | Green | Green | Red | Red | Red | Green | Red | Yellow | Red | Red | Red | Red | Red | Yellow | Red | Red | Red | Yellow | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Yellow | | |
| Tanzania | Red | Green | Green | Red | Green | Yellow | Green | Yellow | Red | Red | Red | Green | Red | Yellow | Red | Red | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Green | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Yellow | | |
| Tunisia | Red | Green | Yellow | Red | Green | Yellow | Green | Yellow | Red | Yellow | Red | Green | Yellow | Yellow | Red | Red | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Green | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Yellow | | |
| Tuvalu | Yellow | Green | Yellow | Yellow | Green | Green | Green | Red | Red | Yellow | Red | Green | Red | Yellow | Red | Red | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Green | Green | |
| Türkiye | Yellow | Green | Yellow | Red | Green | Yellow | Yellow | Green | Red | Red | Red | Green | Red | Yellow | Red | Red | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | |
| Uzbekistan | Yellow | Yellow | Green | Red | Green | Green | Green | Yellow | Red | Red | Red | Green | Yellow | Yellow | Red | Red | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | |
| Vietnam | Yellow | Green | Yellow | Yellow | Green | Yellow | Yellow | Yellow | Red | Yellow | Red | Yellow | Yellow | Red | Yellow | Red | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | |
| West Bank and Gaza | Yellow | Green | Green | Red | Green | Yellow | Green | Yellow | Red | Red | Red | Yellow | Red | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Yellow | Yellow | Yellow | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Red | Green | Green |
| Yemen | Yellow | Green | Green | Yellow | Yellow | Green | Green | Green | Red | Yellow | Red | Green | Red | Green | Red | Yellow | Red | Red | Red | Red | Red | Red | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Green | |

Figure 11. Results of the screening analysis of 71 CCDRs (in %)

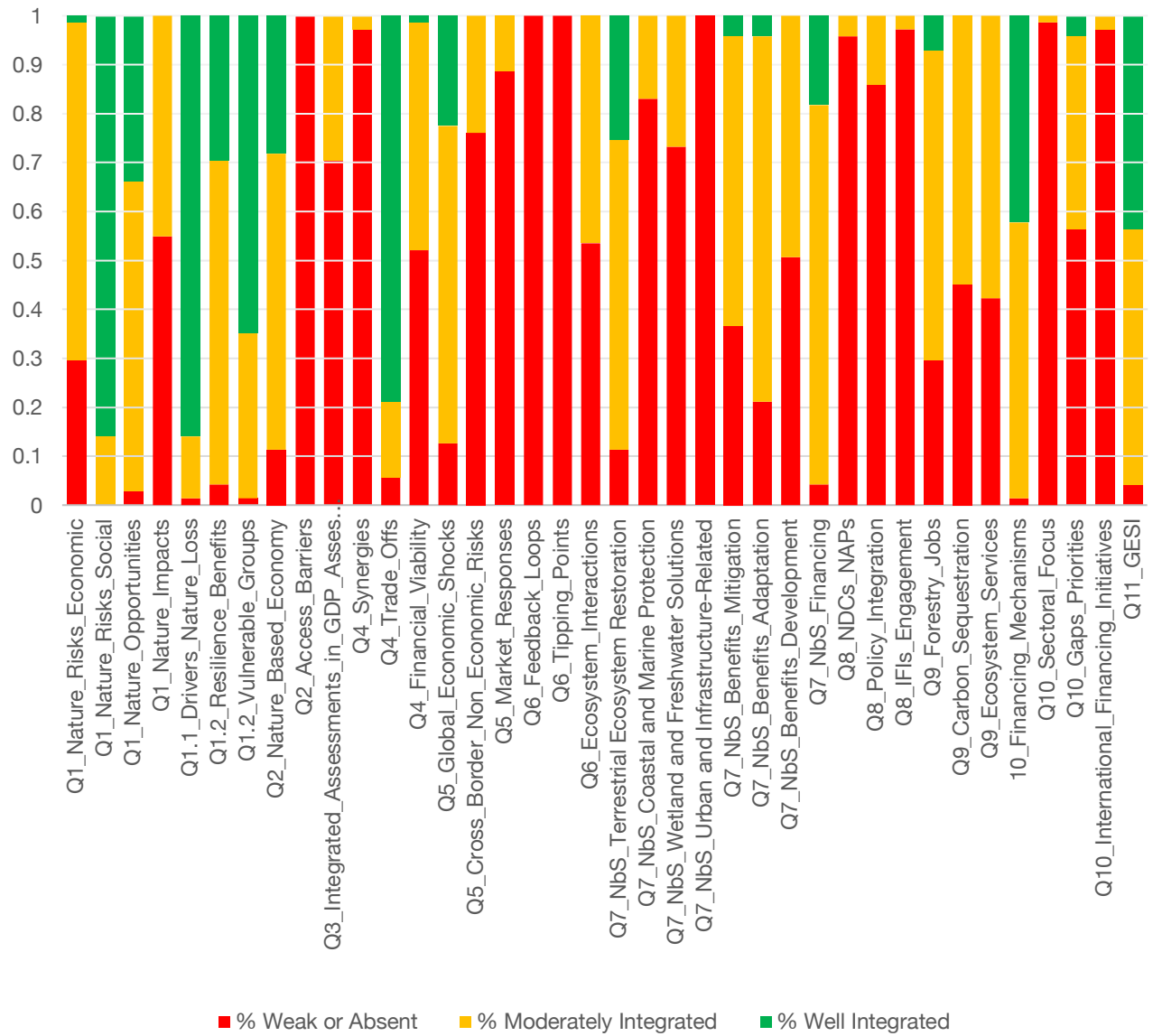
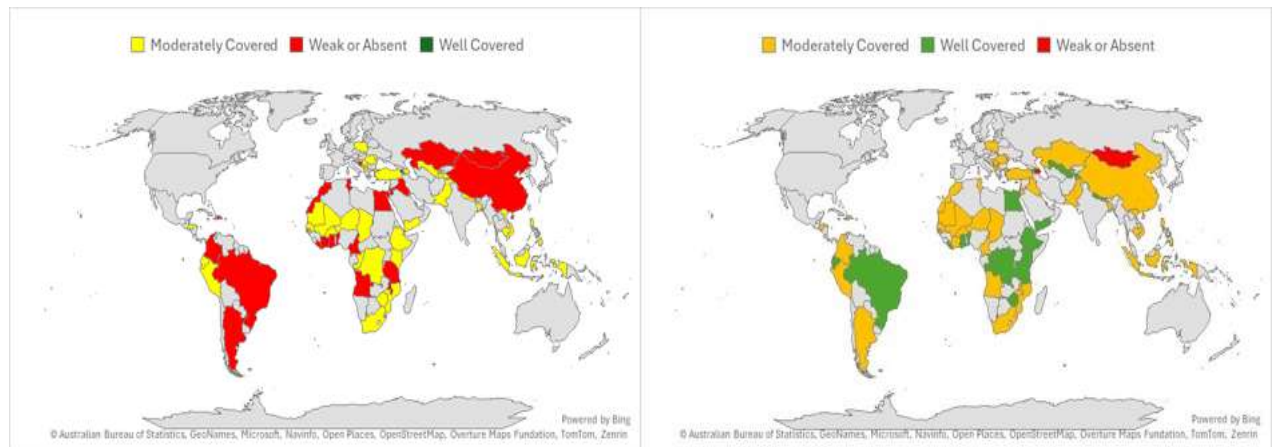


Figure 12. (left) Economic risks and (right) opportunities for growth and development

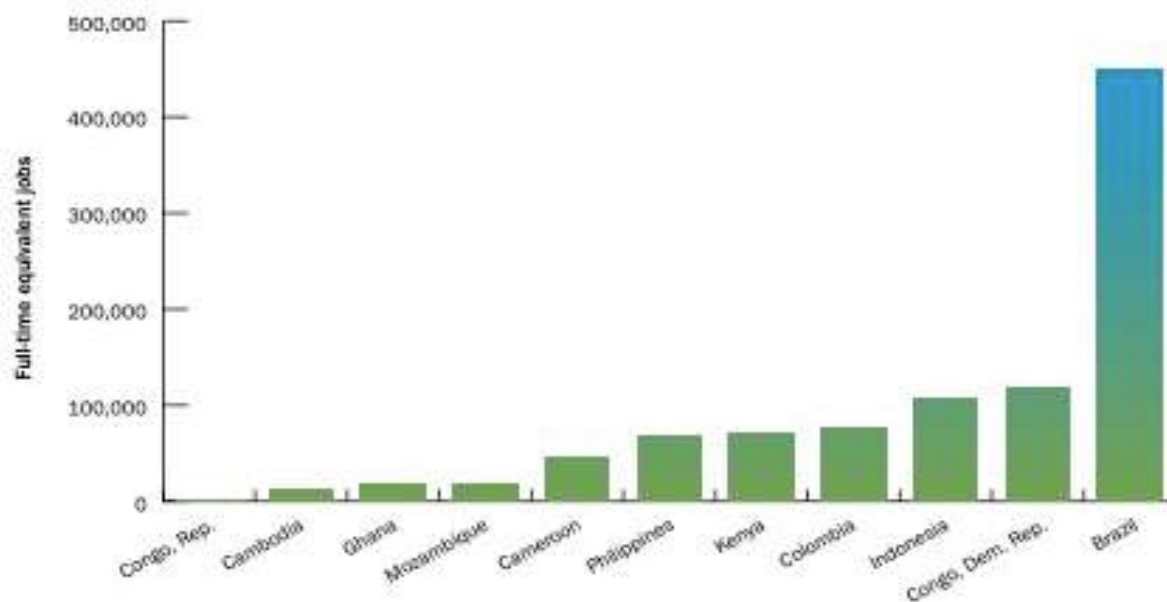


Nature-based solutions are covered differently depending on the type of NbS. Indeed, **NbS for adaptation** are relatively well-covered compared to **mitigation** or **development**, indicating a stronger focus on resilience strategies rather than broader economic and social benefits. For example, Egypt emphasizes urban greening for cooling and flood management. The Maldives discusses mangrove and coral reef restoration for coastal protection. Saint Lucia and Dominica highlight NbS as a tool for mitigating extreme heat impacts. Among the countries, with a high NbS integration we found Vietnam, Philippines, Rwanda, which included detailed strategies on reforestation, coastal resilience, and ecosystem-based adaptation. It is unclear why these countries perform well; it could be related to the level of training of the team who conducted the CCDD or the client interest. On the other hand, countries with minimal integration are Uzbekistan, Serbia, Poland, focusing on energy transition but lacked NbS considerations.

Some reports address **international risks related climate and nature**. Morocco identifies climate change as a potential disruptor of commodity prices, affecting food and energy security, but no explicit reference to nature. Egypt discusses supply chain vulnerabilities related to climate risks at ports, but again not nature specific. However, most CCDDs lack analysis of cross-border dependencies, such as how biodiversity loss in one country affects global trade.

Lastly, there is a moderate discussion on the **links between forestry, jobs, mitigation, and resilience in forested countries**. This is discussed in more detail in the annual review (World Bank, 2024), which includes additional analyses on the labour demand benefits of forestry projects. For example, Vietnam has a Payment for Ecosystem Services (PES) program that links forestry to job creation and resilience. Cambodia highlights deforestation's impact on local communities, but there is limited discussion on sustainable forestry as a job creator.

Figure 13. Annual labour demand benefits of forest restoration activities (World Bank, 2024).



Areas of weak coverage:

Despite the critical role of ecosystems in economic resilience, most CCDRs lack robust **quantitative assessments of nature-related risks and their impact on macroeconomic stability**. Some reports attempt to estimate these risks, but their integration remains incomplete. For example, China’s CCDR estimates that climate change could lead to GDP losses of 0.5–2.3% annually, yet it does not comprehensively account for ecosystem degradation and biodiversity loss. Similarly, Benin’s CCDR reports GDP losses due to extreme flooding, but it does not explicitly link these losses to broader nature-related risks such as deforestation, soil erosion, and watershed depletion. The absence of ecosystem degradation metrics in GDP impact assessments weakens the ability of policymakers to design nature-positive economic strategies.

Beyond economic assessments, **critical policy frameworks such as Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs)**, remain weakly addressed. While some CCDRs reference alignment with NDCs, few provide substantive discussions on how they integrate with NAPs or National Biodiversity Strategies and Action Plans (NBSAPs). This disconnect highlights a missed opportunity for strengthening cross-sectoral coherence and strategic planning. For example, Tanzania’s CCDR discusses integrating climate resilience into urban planning, yet it acknowledges the challenges of operationalising NDC commitments, demonstrating the gap between high-level targets and actionable policies.

There is also weak integration of **nature-based financing and investment**. Most reports focus heavily on land-use and forestry finance while neglecting broader natural capital investments that could drive economic resilience. For example, countries such as Grenada and Saint Vincent and the Grenadines acknowledge financial barriers to Nature-Based Solutions (NbS) but lack detailed financial modelling to support investment decision-making.

Many CCDRs overlook **ecosystem-climate feedback loops and tipping points**, which are essential for understanding long-term risks and resilience dynamics. Only a few reports explicitly address these interconnections. For instance, the West Bank and Gaza report highlights how deforestation and degraded water management systems exacerbate water scarcity, creating a self-reinforcing cycle of environmental stress. Similarly, Uzbekistan's CCDR recognizes land degradation as a contributing factor to worsening climate risks but does not provide quantitative modelling of these feedback effects. Without structured assessments of nature-climate interactions, decision-makers are highly likely to underestimate long-term vulnerabilities and the wide range of social, economic and other impacts from nature's degradation and loss and fail to implement effective mitigation strategies.

Cross-cutting messages emerging

- The depth of integration of nature in the CCDRs did not increase significantly over time.
- Economic assessments rarely quantify ecosystem degradation costs, missing a key input for policy prioritisation.
- Energy transition policies dominate many CCDRs, often overlooking ecosystem impacts.
- Financial instruments for nature-positive investments are lacking, limiting large-scale NbS adoption.
- The absence of well-defined financial strategies for integrating ecosystem-based approaches into development planning remains a major obstacle to advancing nature-positive economic policies.
- Strengthening financial modelling and policy integration will be crucial for leveraging NbS as a cost-effective and sustainable solution to environmental and economic challenges.
- Nature-based solutions are often underfunded despite their cost-effectiveness for disaster risk reduction.
- Recognizing gender and social differences in needs and capacities to implement NbS is essential to facilitate equitable participation and influence in decision-making processes and foster an equitable distribution of benefit

6. Conclusions



Tamnougalt, Morocco. Photo by [Sergey Pesterev](#) on [Unsplash](#)

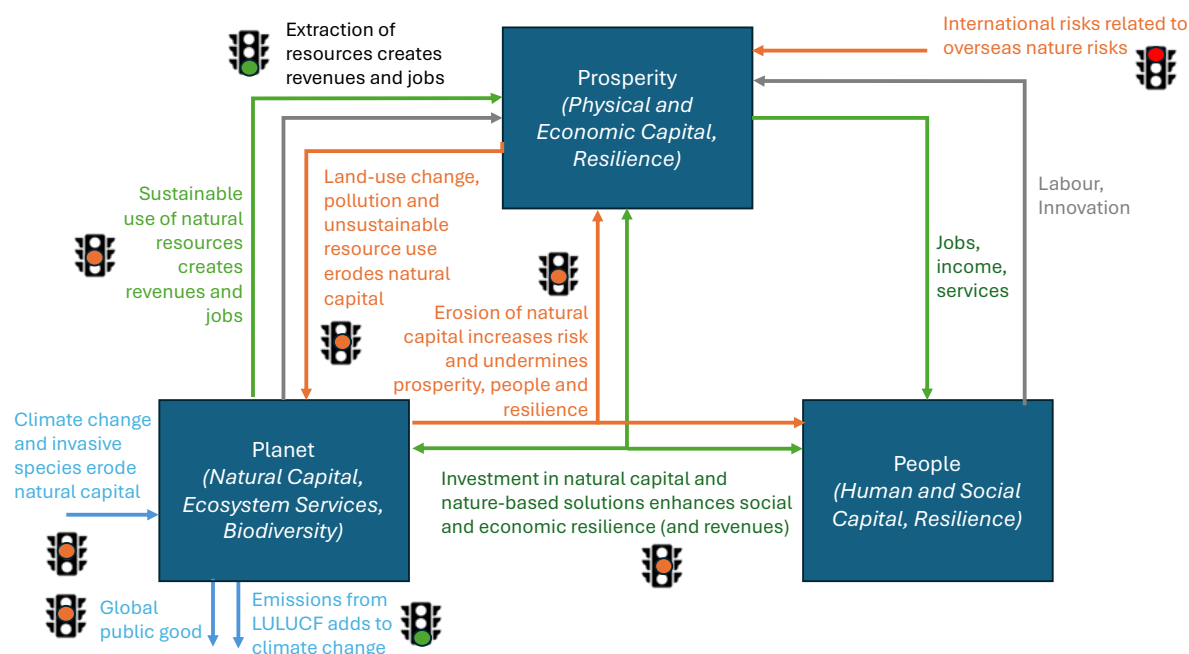
At the outset, it is important to applaud the World Bank for the CCDRs. The analyses are high quality, detailed and comprehensive and well-tailored to support clients. The CCDRs are a huge undertaking, and this analysis has confirmed that the work is already extremely high quality and comprehensive. It is always easy to make recommendations for doing more, hence it is important to recognize up front the huge achievement and value of the CCDRs as they stand.

It is also important to recognize that countries face a vast array of threats and opportunities with complex interconnections. While the CCDRs focus on the interaction of climate and development, the interlinkages with wider governance, fiscal and economic challenges is at the heart of the CCDRs. The focus is on poverty alleviation and shared prosperity and the CCDRs focus on the country perspective of how to manage threats and take opportunities to those development objectives. Any greater inclusion of nature should follow this same principle.

This analysis shows that the World Bank has already taken steps to incorporate aspects of nature into the CCDRs, however the analysis is not yet systematic or comprehensive. Figure 14 captures a high level summary of the inclusion of nature within the CCDRs. The analysis has shown that while most of the key transmission channels between nature (planet), people and prosperity are covered to an extent, the comprehensiveness of the assessment of linkages is

patchy and weak in some areas. Priorities for each country are included, but there is a **clear lack of any systemic framework for assessing these transmission channels** which risks key issues – risks and opportunities – being missed.

Figure 14. Summary of inclusion of nature versus the framework (see Section 2, Figure 5).



A lot of the discussion of nature opportunity and financing is in the context of carbon mitigation (scoring green in Figure 14), while the CCDRs are generally (not in all cases) weaker on resilience and wider values of nature for livelihoods. The analysis also tends to be stronger in forestry and water supply, and weaker on issues such as pollution and land degradation. International risks are almost entirely missing. In the main, where nature is included in the CCDRs it is more qualitative compared with the climate-related analysis; indeed, in no case was there comprehensive inclusion of natural capital within the macroeconomic modelling of the CCDR. There are questions that could be asked about whether the CCDRs are really providing actionable insights on nature, however this question probably also applies to the climate analysis included and depends on what the main purpose of the reports is.

The World Bank could provide even better support to its clients – and meet its 2021 commitments as part of the MDB Joint Statement on Nature - through doing more to integrate nature in a more comprehensive and systematic way, with a focus on risks and opportunities. The risks and opportunities from nature to the World Bank’s mission are clear, as demonstrated in the analyses already included in the CCDRs. However, there is a need to ensure that nature-related factors are more consistently, coherently and comprehensively incorporated in the

CCDRs. This does not necessarily mean that all risks are covered – and inevitably nature will feature more prominently in some CCDRs than others - but that there is a need for a strategic framework to ensure key risks are identified and prioritized as well as analyses on the options to manage these risks. We recommend that such a framework could build off the Changing Wealth of Nations approach but also bring in other elements that more fully capture the status and flows of ecosystem services, the dependencies and opportunities, and the impacts on people and planet. Without this, clients could miss important risks and opportunities.

Decisions will need to be made about how far CCDRs should go in analysing nature-related risks, dependencies, opportunities and impacts. This is an open question and will depend on the country and identification of the most material issues. However, the science and economics point to going further than today. For example, biodiversity is barely mentioned, yet biodiversity has important linkages with resilience and economic development. Health and soil risks are also critical. Other issues like pollinators, water quality and chemical pollution are important. The World Bank will also need to consider how far it goes in its analysis of actions to meet goals. For example, should it use CCDRs to support clients in assessing options to meet commitments against the Global Biodiversity Framework? This is an important commitment of the World Bank.

A fully nature-integrated CCDR would be a powerful tool in supporting dialogue with clients but also in forming a foundation to wider work to mainstream nature across operations, technical assistance, training and diagnostics at the World Bank. This includes a potential link to other diagnostics, such as debt sustainability analyses and the financial sector assessment programme. At country level, this could also support the development and delivery of coordinated and aligned Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) and National Biodiversity Strategies and Action Plans (NBSAPs) through providing a shared understanding and common approach to risk and opportunity assessment that could form the basis of multiple policy and planning processes. The CCDR cannot answer all issues but can provide a simple common understanding of key issues and priorities, both within the World Bank, with the client, and with the wider ecosystem of stakeholders and IFIs.

7. Preliminary recommendations



Amansuri Lake, Ghana. Photo by Ato Aikins on Unsplash

- ▶ **A simple step the World Bank could take is to assess economic dependencies on natural capital and the risks inherent in this given the erosion of natural capital across many economies.** Beyond, this a greater focus on international risks is critical both for nature and climate, e.g. potential food price risks and disruptions to trade. There are tools available to do this, including the nVaR framework and scenario approaches developed in collaboration with the NGFS (Ranger et al. 2023, 24). Such an analysis can be done with existing data, including building off existing World Bank work.
- ▶ **Develop a strategic framework that will ensure more consistent, coherent and comprehensive identification and prioritisation of nature-related risks, drivers, dependencies and opportunities to incorporate.** This can build off the approach of the World Bank’s Changing Wealth of Nations but should go beyond it to fully capture the linkages between ecosystems services, risk and productivity, in particular the dependencies of the economy on nature (e.g. see approach outlined in Ranger et al. 2025 for debt sustainability¹⁷ - Figure 12). The framework used for analysing the CCDRs developed by the authors for this

¹⁷ Ranger et al. 2025 <https://www.lse.ac.uk/granthaminstitute/publication/integrating-nature-into-the-imf-world->

report, which combines aspects of the World Bank's Changing Wealth of Nations approach, the Ranger et al. Nature Value at Risk framework, and the TNFD LEAP approach, is a starting point. Pilot this in two to three countries. The framework should allow World Bank teams to rapidly assess which factors to prioritize and discuss the relevant drivers, risks and impacts with clients.

► **Within the CCDRs, nature and GEDSI should continue to be integrated alongside other climate and development challenges (not separated).**

People, nature, climate and development are interlinked. In addition, many of the solutions have co-benefits and trade-offs and require financial and institutional mechanisms that are fully integrated at country-level. Given the potential influence of CCDRs on policy at country level, integration within the CCDRs could support the development and delivery of coordinated and aligned Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) and National Biodiversity Strategies and Action Plans (NBSAPs) through providing a shared understanding and common approach to risk and opportunity assessment, with the client, within the World Bank, and with the wider ecosystem of stakeholders and IFIs.

► **Develop a set of data, tools and models to support the mainstreaming of nature within the CCDRs, including:**

- **Augmenting the Changing Wealth of Nations dataset.** This could include the development of a risk, dependency and impact tool, building off existing approaches, that could provide a rapid screening of risks with backward-looking and forward-looking components that capture the core dependencies of the economy on nature and the risks therein. These augmented analyses could form the basis for a fuller and more comprehensive foundation to the value of natural capital.
- **Investing in improved standardised tools to assess benefits of nature-based solutions and other nature-based opportunities** rapidly within CCDR, so to increase the ease of integration. FCDO has funded two such projects at Kings College¹⁸ and Oxford¹⁹ that could be leveraged for such a toolkit. This could be coordinated with ongoing joint work by MDBs to conduct a stocktake of nature-related KPIs and existing toolkits such as inVest.
- **Include systematic analyses of the impact (positive and negative) of subsidies for nature (as part of a more integrated assessment),** including

¹⁸ policysupport.org - Co\$tingNature

[infrastructure/](#)

for fossil fuel, agriculture and fisheries, which play an important role in managing nature-related risks and opportunities. Building off existing work, such as the World Bank studies on ‘Detox Development’.

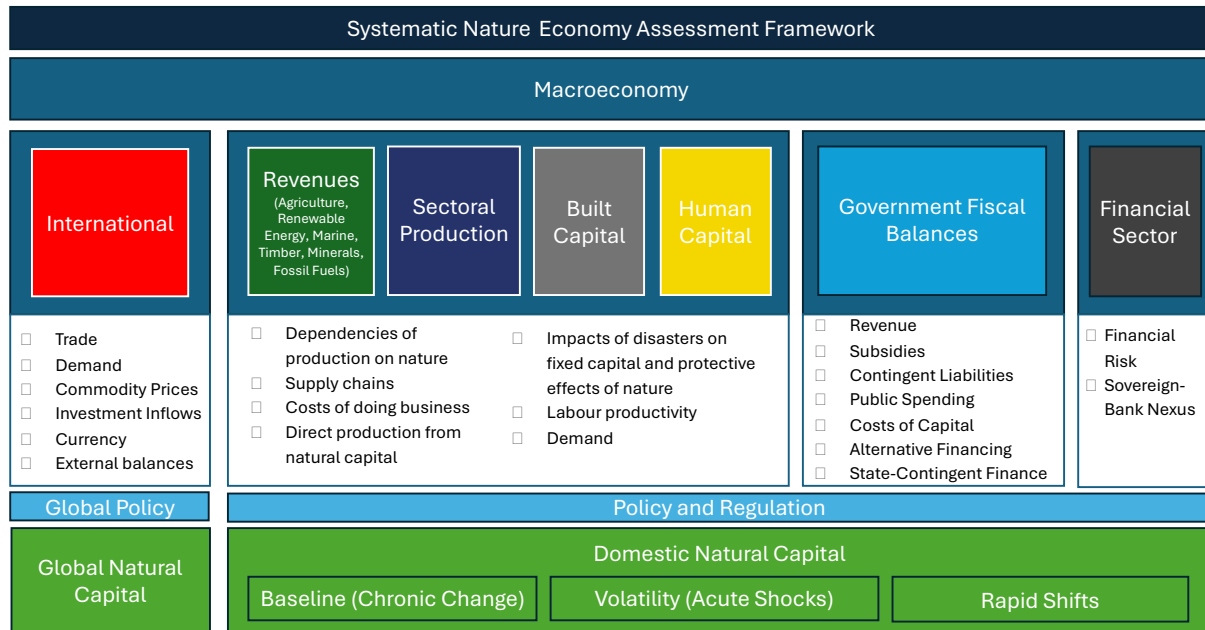
- **Develop a basic framework to incorporate natural capital more fully into macroeconomic models used in CCDRs.** These should capture not just revenues from more traditional activities (e.g. timber, enhanced agricultural output, carbon sequestration), but also the resilience benefits of investing in nature-based solutions and more sustainable practices as well as restoring degraded lands, and also the important dependencies of the key productive sectors (including e.g. manufacturing and services) on nature, as outlined in Ranger et al. 2025 (Figure 12). This would better capture the macroeconomic value of natural capital. Developing equal opportunities and benefits for communities at micro level should also be addressed.
- **Developing an inventory of other data, models and tools** that can be accessed by the World Bank to fill some of the current gaps in terms of risks, opportunities and impacts, with a GEDSI approach. This could include third-party data and models accessed through partnerships.

The goal of this toolkit is to increase the ease of integration of nature into the CCDRs and support teams.

- ▶ **Enhance understanding and analytical capability with clients on nature through the CCDRs and develop educational toolkits to share knowledge with the wider development community.** This could include producing simple dashboards from data and tools noted above.
- ▶ **Develop an easy-to-use template and framework for World Bank teams and their clients to identify priority policy and finance recommendations relating to nature.** This template and framework should integrate climate and nature policies, including the new NBSAPs to create a strong basis for clients to take an integrated approach to strategic planning and investment choices in client countries.

It is recommended that these approaches be piloted within two to three countries in 2025, with progress updates provided at the World Bank Annual Meeting and COP30.

Figure 15. A new comprehensive nature–economy assessment framework. (Source: Ranger et al. 2015)



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Annexures

Annex 1: CCDR DEEP DIVE ANALYSES

INDONESIA

| Area | Integration of Nature | Comments |
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| <p>Nature-related risks.</p> <p>Critical sectors analysed for dependencies on natural capital</p> | <p>No systemic and explicit assessment of nature-related risks, however several aspects of nature-related risks are covered, for example:</p> <ul style="list-style-type: none"> - Health damages from smoke associated with forest clearing for agriculture (estimated to cost US\$23.5 billion over 2008-2017, associated with increased agricultural production of US\$48 billion - Fires associated with forest clearing. The CCDR reports that the 2019 fires cost US\$5.2 billion (0.5% GDP) through their impact on agriculture, forestry, tourism, transportation, health, and school closures - Heat stress in urban areas driven by urban development patterns - Rising risks of water scarcity, due to growth in demand for water outstripping infrastructure improvements - Increased runoff and vulnerability to floods associated with urbanisation and removal of forests. Between 1990-2021, Indonesia experienced 200 flooding events affecting more than 11 million people. - Groundwater extraction leading to land subsidence– thereby compounding the flood risks by lowering the height of land | <p>Key aspects are mentioned but not well tied to narrative on economic development</p> |
| <p>Drivers</p> | <ul style="list-style-type: none"> - Agriculture and forestry activities were primary drivers of land cover change, notably export-orientated timber extraction, and pulp and paper plantations (rapid expansion 1980s-90s) and oil palm (1990s-2000s). Large impacts on peatlands. 20-30% land conversion in past two decades due to oil palm plantations. - Mangrove conversion for agriculture and aquaculture in coastal areas - Tightened forest and peat protection has slowed deforestation, including peat rewetting and fire suppression - Impacts of economic development on water supplies, leading to increased water crises - Urbanisation: between 2000 and 2014, Indonesian cities expanded by 3.9%, with nearly three-quarters of this expansion on cultivated land or natural ecosystems. In DKI Jakarta, for example, the vegetated area decreased from 60 to 29 percent between 1990 and 2018, increasing runoff rates and vulnerability to floods. - Urbanization trends driving groundwater extraction | <p>Good coverage</p> |

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| | <ul style="list-style-type: none"> - Climate change will increase fire, flood and drought risk. Pest and disease outbreaks—often induced by higher temperatures—are expected to intensify along with the impact of floods, droughts, and saltwater intrusion. | |
| Nature impacts | <ul style="list-style-type: none"> - No mention of impacts of activities on biodiversity - Impacts on peatlands, mangroves and forests are discussed extensively but mainly from a GHG emissions perspective | Missing. GHG focus only |
| Livelihoods, jobs and growth | <ul style="list-style-type: none"> - Little explicit mention beyond emissions reductions. Does not that oil palm smallholder production has considerable scope for increasing yields within the existing production area, enhancing livelihoods while reducing forest loss. | Missing. GHG focus only |
| Nature-based solutions | <p>Some explicit mention of nature-based solutions, e.g.</p> <ul style="list-style-type: none"> - Identifies that restoration and rewetting of drainage-based agricultural cultivation in low-lying areas of Sumatra and Kalimantan will help reduce flood risks that are further compounded by sea-level rise. - Halting mangrove loss for aquaculture development (concentrated in Kalimantan and Sulawesi) and for oil palm (concentrated in Sumatra) will strengthen the protective benefits that intact mangroves provide for communities and infrastructure along coastlines. | <p>No systemic assessment, No quantification</p> <p>Missing e.g. urban solutions</p> |
| Synergies and trade-offs nature, adaptation and mitigation | <ul style="list-style-type: none"> - Deforestation and fires have accounted for around 42% of GHG Emissions. More than 60 percent of the emission reduction target in Indonesia’s Enhanced NDC is intended to be met through actions in the FOLU sector. The government further aims to make FOLU a carbon sink by 2030 (that is, negative net emissions) under its FOLU Net Sink 2030 plan. This includes restoring 2.7 million hectares of peatlands, rehabilitating 5.3 million hectares of degraded forestlands, and continuing progress in reducing deforestation and forest degradation rates. Reforestation, peatland restoration, and mangrove restoration targets are also included in the RPJMN 2020-24. FOLU Net Sink 2030 activities are also expected to have important co-benefits for biodiversity and soil and water management - The vulnerability of Indonesia’s cities could decrease through improved patterns of land use and reduced groundwater extraction | Adaptation and mitigation well covered. Nature not mentioned |
| Treatment of international risks | <ul style="list-style-type: none"> - Identifies commodity risks related to oil palm. In 2019, Indonesia produced 52 million tons of palm oil product—mainly from plantations in the lowlands of Kalimantan and Sumatra —contributing 72 percent of global supply and 4.5 percent of Indonesia’s GDP. Palm oil faces growing global demand, but the low-carbon transition implies restrictions on the supply of new land and rising costs of fuel and fertilizer. Land availability may decrease as forested areas are more strongly protected. Producers will need to use existing land, fuel, and fertilizer more efficiently. | Limited treatment of international risks |

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| Policy | <p>Several policies and commitments related to natural capital are highlighted, for example:</p> <ul style="list-style-type: none"> - The protective benefit of mangroves is recognized by the government in its recent commitment to restore 600,000 hectares of mangroves by 2024—the largest such effort in the world. - In 2011 the government placed a moratorium on new licenses for forest conversion in primary forests and peat and in 2016 strengthened the moratorium for areas of deep peat. These moratoriums protect a combined 66 million hectares. - The government’s commitment to land rights reform is noted in the context of reducing land-based emissions. | Good coverage |
| Financing | <ul style="list-style-type: none"> - No explicit inclusion | Missing |
| Quantified analyses | <ul style="list-style-type: none"> - Land-related scenarios and policies are modelled from an emissions perspective, including co-benefits in avoided fire damages to crops, food prices and health impacts. Scenarios include current restoration policies, peatland restoration, extended forest and peatland moratoriums, land-based emissions tax. | Limited inclusion |
| GEDSI | <ul style="list-style-type: none"> - The report recognizes that climate shocks are disproportionately felt by the poor and vulnerable. Given the country's geographic location, there is an emphasis on disaster risk management (DRM), and mention is made of the increased risk for women, girls, poor people and people with disabilities. Disaster-response planning is often male dominated. - Proposes DRM processes to address the needs of diverse and vulnerable groups. Develop targeted mitigation and preparedness initiatives for people of all ages, abilities, and genders; and ensure inclusive response and recovery programs. - Climate Smart Agriculture faces challenges: fragmented land holdings and gender barriers that limits women’s access to extension services and new technologies. - Access to green jobs is not equal because they tend to demand science, technology, engineering, and mathematics qualifications that women are less likely to pursue. - The report stresses the importance of introducing climate change education in schools as a means to help young Indonesians understand risk uncertainty and rapid change, in addition to promoting the acquisition of transversal skills essential for green jobs. - There are not explicit references to GEDSI and nature. The report states that agriculture is vulnerable to climate change impacts with implications for food and nutrient security. Data from 2021 show that a quarter of children under 5 years of age suffer from stunting. | |

BRAZIL

| Area | Integration of Nature | Comments |
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| <p>Nature-related risks.</p> <p>Critical sectors analysed for dependencies on natural capital</p> | <ul style="list-style-type: none"> - The CCDR stresses the vital ecosystem services provided by Amazon and Cerrado Biomes for Brazil - Water features clearly. It highlights that increasingly frequent and intense water crises are already being experienced. Growing competition for water will pose threats to all water dependent sectors including power and mining, exposing risks to growth - Hydropower is main source of electricity (83% in 2021), but concerns about reliability with growing water scarcity. - Extreme heat due to native vegetation loss cost the soy industry US\$99 per hectare of lost revenues (2005 dollars). - Identifies tipping point beyond which large parts of the Amazon basin no longer have sufficient rainfall to support native ecosystems and forests and irreversible damage to the biome. | <p>Limited coverage. E.g. linkages to flood and landslide risks missed, food security, pollution risks etc.</p> |
| <p>Drivers</p> | <p>Pressures of economic development in Brazil are a main driver, which has mainly driven by the agriculture and extractives (oil, gas, mining), with the following specific issues:</p> <ul style="list-style-type: none"> - Expected increase in water for irrigation will likely result in growing competition over water for agriculture and hydropower. - Deforestation recently began trending upward, after long term declines in rates between 2004 and 2012. Illegal logging, agriculture (including cattle ranching), and land grabbing, responding to weak law enforcement, poor land governance, and macroeconomic drivers (commodity prices and demand, exchange rates), have all been identified as drivers of deforestation. Vast majority of deforestation activity is considered illegal as part the Forest Code. Incentives to deforest for agriculture also come from subsidies, rural credit policies, and the structure of the rural land tax. - Deforestation in the Amazon is negatively impacting rainfall patterns across large parts of Brazil. Loss of native vegetation in the Cerrado where the main aquifers are located is increasing aridity and leaving water bodies unprotected - Climate change, growing demand and land degradation are and will put considerable stress on water. - Growing demand for manganese linked to green transition, much of which has occurred in the state of Pará, has resulted in illegal mining, including on Indigenous territories in the state. Evidence shows that mining activities have caused significant deforestation, both within and outside mining lease boundaries. | <p>Good coverage</p> |

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| Nature impacts | <ul style="list-style-type: none"> - Clearly highlights the impacts of climate change, economic development and illegal activities on the Amazon and Cerrado biomes, yet focus is on the implications for mitigation and to a lesser extent, resilience. No mention of biodiversity. | Limited |
| Opportunities livelihoods, jobs and growth | <ul style="list-style-type: none"> - Not directly discussed. The CCDR does note briefly that further preserving Brazil's natural landscapes, and curbing deforestation, would contribute to more resilient agriculture and land use, including stabilising temperatures, water supplies, hydropower, soil erosion, nutrient loss and the financial sector. - Notes the opportunity for inclusive growth in rural areas through forest-based economic activities (not details). - Boosting agricultural productivity reduces pressure on land. | Limited. Main analysis is carbon focussed |
| Nature-based solutions | <ul style="list-style-type: none"> - No detailed analysis but mentions the 2022 NDC includes reference to promoting ecosystems-based adaptation for extreme events. The NDC and NAP does not quantify targets or set any action plan for adaptation. | Limited. Missing aspects. |
| Synergies and trade-offs nature, adaptation and mitigation | <ul style="list-style-type: none"> - Adaptation: CCDR highlights strong linkages between resilience and preserving natural capital - Mitigation: LULUCF emissions are the largest component of Brazil's greenhouse gas emissions (52%) and includes substantial removals by Brazil's natural ecosystems (600Mt CO₂e). The Amazon acts as a huge carbon sink. - Highlights biofuels commitment but no discussion of trade-offs - Crossing a tipping point in the Amazon could lead to the loss of colossal quantity of carbon dioxide, the economic impacts of which could lead to \$184bn loss for Brazil alone (10% GDP in 2022). - Critical minerals: Brazil is the world's largest producer of niobium, the second largest producer of iron ore and manganese, and among the largest producers of bauxite and tin. Minerals, such as manganese and rare earths, are crucial for technologies that support global decarbonization, and demand for them is projected to increase in the coming decades. Brazil also is currently competitive in several critical materials used in EV batteries and electric and hydrogen-fuelled buses. While the graphite market is largely dominated by China, Brazil has the third-largest graphite reserves in the world and is the second-largest producer of natural flake graphite. Brazil is also competitive in calcined petroleum coke, the anode material in lithium battery. But the environmental footprint is significant. Climate-smart mining practices can reduce the footprint of mining activities. | Good but does not fully capture trade-offs with resilience and natural capital |
| Treatment of international risks | <ul style="list-style-type: none"> - Vulnerability to global commodity prices. Dominance of commodity exports: share of agriculture and extractives in exports grew from 9% and 7% in 2000 to 39% and 36% in 2021. Notes impact of the end of the commodity supercycle on Brazil's economic development ambitions - Highlights vital ecosystem services provided by Amazon and Cerrado Biomes for the South American region and globally | Limited |

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| <p>Policy</p> | <p>Notes several policies with a link to natural capital, e.g.</p> <ul style="list-style-type: none"> - 2022 NDC calls for a strengthening of the forest code (zero illegal deforestation, restoring 12 mha of forests by 2030, and enhancing sustainable forest management systems), sustainable biofuels and strengthening the Low Carbon Agriculture Program (ABC Plan), restoring 15 mha degraded pasturelands by 2030 and enhancing 5mha integrated cropland-livestock-forestry systems. - Documents legislative and judiciary frameworks protecting the Amazon and its indigenous peoples (pg. 19/20). - Documents weakening of institutions responsible for environmental protection (including budget cuts, regulatory changes and interference by special interest groups). - Need to address harmful subsidies is discussed - Contains extensive discussion around avoiding deforestation. Stopping illegal deforestation (Forest Code) and boosting land-based and forest carbon removals. Strengthening institutions and monitoring. | <p>No discussion around managing harmful impacts of mining and extractives or managing illegal activities</p> |
| <p>Financing</p> | <ul style="list-style-type: none"> - Mentions potential role for payment for environmental services but no details are given. - Fossil fuel subsidies and incentives documented. - Taxes, subsidies and credit schemes promote extensive agriculture and carbon intensive practices, e.g. cattle ranching. - Notes that making forest protection compatible with economic development requires a recognition of the public-goods nature of natural forests, where the value of ecosystem services considerably exceeds the private exploitation values. For example, performance-based financing can help generate a political economy more conducive to forest protection - Significant opportunities related to carbon markets. Brazil is the fourth largest global seller of Certified Emissions Reductions (CERs) and third largest country for registered CDM project activities, as well as a main player in voluntary carbon markets. Article VI could increase flows in the coming decades (\$300bn to \$1trillion globally by 2050). | <p>Limited</p> |
| <p>Quantified analyses, including macro modelling</p> | <ul style="list-style-type: none"> - CGM model quantifies impacts of scenarios including forested land and mining exports. Scenarios assume changes in sectoral growth, productivity and demand. Finds e.g. an increase in global food demand would increase GDP but at the expense of natural forests and would depress mining (due to competitiveness of exports). Assumed increase in productivity of manufacturing would increase forested land by reducing competitiveness of extractive sectors and agriculture, as well as lower emissions. - GHG modelling (figure 10) suggests carbon removals can be increased significantly and LULUCF emissions reduced. - Integrated Economic-Environmental Model (IEEM) platform used to model benefits of land-use change scenarios for emissions, GDP and social gains. Shows Brazil can reach its climate commitments and boost GDP and inclusive development through a combination of effective law enforcement, forest governance and | <p>Limited</p> |

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| | diversified land-based economic activity, including forest-based activities and increased productivity of agriculture. The model also shows the benefits for water runoff under the scenario. | |
| GEDSI | <p>The report recognizes existing inequalities in Brazil from an intersectional perspective. It mentions income, regional disparities, racial and age factors as drivers of inequality, yet most analysis is not nature specific.</p> <ul style="list-style-type: none"> Poverty is considered transversally in the report. It is recognized that climate change has an impact on both these documents already contain GEDSI criteria that could be incorporated into the proposed actions. <p>responsive activities.</p> <p>exceeds the private exploitation values. Nevertheless, the links between GEDSI and Nature are not clearly country's extensive forests. GEDSI can be integrated into the design, implementation and monitoring of carbon</p> | |

MOROCCO

| Area | Integration of Nature | Comments |
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| Nature-related risks | <ul style="list-style-type: none"> Morocco is one of the most water-scarce countries globally. The link between water scarcity, macroeconomic volatility, economic development, energy and food security are strong recognized. Risks are significant to both agriculture, energy and wider macroeconomic volatility. Morocco is estimated to hold approximately 75 percent of the world's phosphate reserves and has become the fifth largest exporter of fertilisers. The phosphate industry is both energy and water intensive, creating economic risks. | Limited. Links to flood risk missing. Issues around soil quality, soil erosion, pollution |

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| | - No explicit mention of nature-related financial risks, despite high physical climate risks (35% assets directly or indirectly exposed) | all missing. |
| Drivers | <ul style="list-style-type: none"> - Overexploitation of ground water – linked to population growth and economic development - is noted as an important contributor of water stress, despite infrastructure investment. Pressure on groundwater resources has significantly increased to a level of exploitation estimated at almost 30 percent. - Loss of volumes of water in reservoirs due to siltation caused by erosion from upstream watersheds. - Overconsumption of water and increased intensity of land use is linked to shift to more water intensive crops as irrigation has become more widespread as well as artificially low water tariffs. - Expansion of mining and quarrying – but no detailed analysis of the risks or impacts. - Several missing aspects in the CCDR (based on rapid literature review): air pollution, industrial and urban pollution management; salinisation and desertification linked to intensive agriculture. Impacts of industrial and human waste on marine ecosystems, including fisheries. Broader issues of uncontrolled waste | Incomplete |
| Nature impacts | None | |
| opportunities livelihoods, jobs and growth | None | |
| Nature-based solutions | None | |
| Synergies and trade-offs nature, adaptation and mitigation | <ul style="list-style-type: none"> - Discusses Morocco’s ambitious reforestation program (Forêts du Maroc 2020-2030) involving 600,000 hectares of forests from emissions reduction perspective. - Highlights water-energy nexus – i.e. the significant opportunities for Morocco from its generous endowment in sources of renewable energy – and potential to export electricity – yet the water dependence of these ambitions. - Notes trade-offs between adaptation, mitigation and nature, e.g. unconventional water sources (desalination and wastewater reuse, both of which are energy intensive) and green hydrogen, which could further amplify impacts on Morocco’s water resources. | Exploration of potential of reforestation programme for resilience and livelihoods |

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| International risks | <ul style="list-style-type: none"> - The report notes Morocco’s susceptibility to global food price shocks, particularly when this compounds with local drought conditions. No explicit link to nature is made. | |
| Policy | <ul style="list-style-type: none"> - Highlights need for more focus on water demand management, including that priority should be given to efforts to save water and energy throughout the water sector value chain. - Highlights Plan Maroc Vert – the large-scale expansion of drip irrigation - NDC and NSAP focusses on agriculture, water, fisheries and aquaculture and forestry. - Integrated planning in place? E.g. 2020 Commission on Climate Change and Biodiversity | |
| Financing | <ul style="list-style-type: none"> - Importance of reflecting the true value of water and water tariff and tradeable quotas is discussed - Discussion of green finance does not mention natural capital - Does not mention environmentally damaging subsidies beyond fossil fuels - No reference to public expenditure related to natural capital | |
| Quantified analyses, modelling | <ul style="list-style-type: none"> - Modelling of the impacts of droughts on agriculture, employment, non-agricultural output and water scarcity includes consideration of scenarios and interventions related to demand (GTAP Bio-Water) only - Flood modelling no consideration of nature-based solutions | |
| GEDSI | <p>The report emphasizes some GEDSI aspects in the economy, agriculture and disaster risks, but doesn’t mention nature or the links when addressing preservation of water and natural resources. Lack of access to jobs constitutes the most powerful force for social exclusion in contemporary Morocco, a problem that is particularly acute for women and the youth. At just 22 percent, Morocco’s female labour force participation is among the lowest in the world. Water scarcity combined with climate change could further exacerbate its labour market challenges. The report presents a review of literature regarding gender differentiated impacts of climate change in Morocco:</p> <ul style="list-style-type: none"> - Women suffer greater exposure and greater vulnerability and have a more limited level of preparedness and coping capacity compared to men in case of disaster. Women are more likely than men to lose their jobs during dry events - During periods of drought, women’s workload rises (mainly to ensure access to water) - In some regions, farm households rely on internal migration to mitigate the consequences of climate change. Men tend to migrate first. A high prevalence of women relative to men in the agricultural sector makes them | |

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| | <p>more vulnerable to the effects of climate change, such as drought and land degradation</p> <ul style="list-style-type: none"> - Climate change is expected to heighten existing gender-equality gaps in employment and income levels; women’s access to and control over productive assets and natural resources; their access to services, skills, and capacity; and their mobility, as well as agency and decision-making power. - Agriculture production is heavily correlated to rainfalls and food security can be challenged during dry years. This scenario requires GEDSI lens. - Poor households tend to be systematically more vulnerable to climate events, but also to the impact of climate policies. Compensatory measures need to be carefully crafted to avoid exacerbating social disparities, and to contribute to an equitable and inclusive transition. - Climate change can undermine the livelihoods in some rural and urban areas, fuelling internal migration and exacerbating issues of social exclusion. - The development of new green sectors of the economy could generate new formal jobs, facilitating the inclusion of women and the youth in the labour market. | |
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DEMOCRATIC REPUBLIC OF CONGO

| Integration of Nature | | Comments |
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| <p>Nature-related risks.</p> <p>Critical sectors analysed</p> | <p>No assessment of nature-related risks and dependencies and not included in quantitative climate risk assessment</p> <ul style="list-style-type: none"> - Notes forests provide livelihoods for 59 percent of DRCs population who are rural - Highlights increases risks of fragility, conflict and violence due to climate change increasing competition over food and jobs, but does not link to nature risks - Highlights the link between climate and poverty drivers but not natural capital - Discusses link between disease and climate, but no mention of nature. - Highlights that DRC needs to protect and manage its forests because if climate impacts – soil degradation, declining vegetation, biodiversity threats, heat, abnormal rainfall – accelerate impacts on livelihoods, people could turn to conflict | <p>Moderate.</p> <p>Emphasis on risks of flood and drought but misses nature-related drivers of these risks, inc. deforestation</p> |

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| | - No mention of health risks related to contaminated land and mining. | |
| Drivers | <ul style="list-style-type: none"> - Forest loss due to biomass for energy: Forest biomass accounts for 94% of total primary energy supply (almost 99% household consumption), driving 18.4 million hectares forest loss 2001-2022 - Notes poor natural resource management and high dependence on mineral exports (link to pollution and health not made) - Notes decline in renewable natural capital since 2000 (water, forests, cropland, wildlife, fisheries, protected areas) - Highlights growing emissions from deforestation under current scenarios and lost value of carbon sink - Footnote (only) – land degradation is reducing soil fertility and ecosystem services such as water, flood mitigation, erosion control, biodiversity and carbon storage (pg. 61) - | No mention of pollution and contamination linked to mineral extraction |
| Nature impacts | - Footnote mentions DRC is one of the world’s mega-biodiverse countries and the threats of illegal wildlife trade (pg. 26) | |
| Nature-related opportunities for livelihoods, jobs and growth | <p>DRC is endowed with huge renewable and non-renewable natural capital with the potential for very significant benefits for livelihoods, jobs and growth:</p> <ul style="list-style-type: none"> - Hydropower could supply all of Sub-Saharan Africa’s energy (excluding South Africa) - Carbon: Peatlands 29Gt sub-soil carbon and forests 85Gt sequestered carbon - Huge agricultural potential, yet DRF is currently a net food importer - 143 million hectares of forest valued at \$6.4 trillion – could generate up to \$400 billion a year from stored carbon and ecosystem services, including flood avoidance, timber production - Job creation through sustainable management of forests, and potential for \$1.76-\$3.8 billion from forest-based ecosystem services. For every \$1 invested in landscape and forest restoration, DRC stands to gain \$15 benefits by 2050. - Forests provide timber, food production, fuelwood, erosion and sedimentation control, regulate and purify water | Carbon/economy focus |
| Nature-based solutions | <ul style="list-style-type: none"> - Notes ecosystem services from forest including flood protection, timber, carbon sinks - Includes discussion and quantification on the benefits of land and forest restoration in terms of flood mitigation. | |
| Synergies | - LULUCF 92% of GHG Emissions | - No explicit discussion of |

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| and trade-offs nature, adaptation and mitigation | <ul style="list-style-type: none"> - DRCs forests one of the few areas of the world that acts as a net carbon sink (822MtCO₂e per year). Opportunities through high carbon sequestration from vast forest resources - Discusses transformation of mining sector due to low-carbon transition as an opportunity. - Notes hydropower fuelled mining ensure low GHG emissions - Clean cooking to avoid deforestation - Emphasizes benefits of reversing landscape degradation and forest loss for resilience and productivity - Irrigation can boost productivity without encroaching on ecosystems or threatening water security - Notes climate-mining-conflict-poverty confluence as a powder keg | <p>implications for people or nature from expansion of mining and how this can be managed</p> |
| Treatment of international risks | <ul style="list-style-type: none"> - Net food importer – vulnerability to food insecurity due to external trade shocks - Exposure to the volatility of global commodity prices due to changing global demand, as export economy (minerals) - Notes global public good provided by DRCs forests. Forests provide 50% of the rainfall that falls in surrounding areas. | |
| Policy | <ul style="list-style-type: none"> - Highlights that to guarantee sustainable management of forests and protect peatlands, DRC needs to prioritize conservation and restoration of its degraded forests by prioritising and managing timber concessions - Highlights commitments by government to forest management. - Highlights collaboration with Brazil and Indonesia on forest conversation - Highlights work to increase conservation and protection of peatlands - Alignment of NDCs – land and ecosystem degradation included in the NAPA. REDD+. Emissions reductions from responsible forest management and land-use included in the NDC. 2022-26 NAP includes forestry and biodiversity and water management in 9 objectives. | <p>Does not link to national biodiversity strategy</p> |
| Financing | <ul style="list-style-type: none"> - Restoring and conserving forest and landscapes could cost DRC \$3.19 bn by 2030 - \$234 million a year for clean cooking - Landscape restoration ‘aspirational scenario’ for restorative and integrated land management will cost US\$3.2 billion by 2030 - Recommends to address funding gap for adaptation and low-carbon, DRC should seek international payments for its global ecosystem services. - Analysis of financial risks does not capture potential nature-related risks, which could be more sizeable than climate risks (e.g. increasing costs to mining-related economy due to global shift toward lower impacting activities). Flagging potential nature-related risks to the Central Bank of Congo as it builds capacity would be advantageous. - Nature-finance opportunities are included, e.g. forest bonds and blue bonds, REDD+ and voluntary carbon markets. - Challenges of REDD+ experience are documented and recommendations given | <p>Lacks discussion of valuation of other forms of ecosystem services beyond sequestration and how these can be monetised/intern alised Missing</p> |

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| | - Importance/opportunity through valuing natural capital to foster DRCs development is recognized, though most discussion is around carbon sequestration as the main value. | roadmap related to nature finance (beyond credits mentioned). |
| Quantified analyses, including macro modelling | <ul style="list-style-type: none"> - Environmental degradation included through socioeconomic scenarios in modelling - Modelling how irrigation can boost agricultural production while avoiding expansion into forests and ecosystems and not impacting water scarcity - Modelling of changes in water resources including changing water demand - Modelling includes a forest restoration scenario to estimate the ecosystem services benefits of investment in landscape and forest restoration, and the benefits for flood risk mitigation - Uses Long-Term Growth Model Natural Resource Extension (LTGM-NR) (including mining as resource sector, not forests) | Incorporate ecosystem services from forests into the model |
| GEDSI | <p>The report makes a socio political and economic analysis linked to climate change and it emphasizes on the link between poverty, social exclusion and climate change. While many issues will be analogous for nature, this isn't explicitly drawn out in general. For example:</p> <ul style="list-style-type: none"> • The report affirms that those people who are dependent on rainforest and biodiversity resources, face increased poverty due to droughts and heatwaves. • The report mentions that the conflict–climate change nexus in DRC manifests in two main ways: conflict-affected persons, especially women and girls, are particularly vulnerable to climate change impacts; second, climate impacts often compound the drivers of conflict, leading to a further entrenchment of the conflict cycle. • In several sections the report uses the GEDSI approach. It affirms that in DRC the rural and urban poor, women and children, indigenous peoples, and people with disabilities all have heightened vulnerability to the negative impacts of climate change. • The report highlights that women are particularly vulnerable to climate change, as they struggle to secure agricultural incomes due to educational, financial, and government service access disparities. • The report recognizes the valuable traditional knowledge and practices of indigenous people for climate mitigation and adaptation, with indigenous women playing a key role in preserving this traditional knowledge • The report mentions the increasing climate change displacement and involuntary migration and the related risks such as deepening impoverishment, exploitation, and sexual violence. There is a need to strengthen efforts to prevent and respond to GBV, particularly during periods of climatic stress | Limited nature specific |

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| | <ul style="list-style-type: none"> • In several sections the report refers to the links climate change / health / education / Infrastructure. It puts • The recommendations emerging from this CCDR emphasize on the needs to strengthen support to local <p>tailored to the unique vulnerabilities of excluded groups.</p> <p>opportunities to local communities for effective climate action.</p> | |
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PAKISTAN

| Integration of Nature | | Comments |
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| <p>Summary</p> <p>The role of environmental degradation in creating climate vulnerability and holding back growth and development, is a key theme of the Pakistan CCDR. This is driven by the visible impacts of environmental degradation, including in the recent 2022 devastating floods that led to X death and Xbn in damages, as well as health impacts related to pollution and lack of agricultural productivity. Efforts to curb environmental degradation, including through tackling harmful subsidies and incentives, and accelerate nature-based solutions are therefore clear within Pakistan’s own climate policies and the CCDR recommendations. Tight interplay between environmental degradation, rising climate risks, and existing institutional and fiscal challenges in Pakistan is clear, as well as the central role of interventions in fiscal policies, planning, services in building resilience.</p> | | |
| <p>Nature-related risks.</p> <p>Critical sectors analysed for</p> | <p>- Water quality: Bacterial contamination of water: Studies have shown that between one-third and one-half of water used for drinking is bacterially contaminated with e. coli at source, and this includes piped water. The near-absence of in-home water treatment increases the bacterial contamination to between 60 and 75 percent when water is tested at point-of-use. Nitrate contamination is also endemic in rural areas because of the excessive use of chemical fertilisers and the lack of wastewater treatment. This is responsible for adverse health outcomes across the population but manifests particularly perniciously in the persistence of stunting among children, despite the decline in extreme poverty.</p> | <p>Lots of discussion and quantification of risks related to nature – e.g. drought and flood – but focus is on the</p> |

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| <p>dependencies on natural capital</p> | <ul style="list-style-type: none"> - High air pollution levels exerts a significant drag on human health and economic performance equivalent to approximately 10 percent of GDP. Air pollution shortens the average Pakistani's life expectancy by 4.3 years, relative to what it would have been if the WHO guideline on air pollution was met. In the highly urbanized cities, especially Lahore, Karachi, and Peshawar, more than 1 million citizens are at increased mortality risk from air pollution. The most harmful emissions are fine particulate matter, or PM2.5, and NOX. Pakistan's PM2.5 concentrations levels, on average, are estimated at five times higher than the WHO's recommended limits and pose a serious health hazard. Damage from air pollution is estimated to impose an additional loss of 6.5 percent of GDP per year. - Water scarcity, with intersectoral trade-offs likely made at the expense of water for agriculture. The use of water for non-agricultural purposes is likely to increase significantly with climate change. Water demand is projected to increase by almost 60 percent, with the highest rates of increase coming from the domestic and industrial sectors. Water availability for irrigation is due to decline, with impacts on agricultural production. Heightened demand for water will result in unintended consequences that deprive downstream areas of water rights. - Livestock productivity is expected to decline further because of reduced water availability, deterioration in fodder and feed quality and quantity, the increased risk of disease epidemics, and increased costs of feed, water, energy and cooling systems. Over 40 percent of livestock feed comes from pastures and rangelands, which are facing accelerating degradation, raising serious concerns about ecosystem integrity and functionality - Changing natural capital contributes to growing disaster risks. Urban sprawl, the absence of green spaces, and the poor state of basic services accentuate people's vulnerability to shocks if, and when, they occur. - The combined risks from the intensification of climate change and environmental degradation, unless addressed, will further aggravate Pakistan's economic fragility; and could reduce annual GDP by 18 to 20% per year by 2050 | <p>response to climate change and not other drivers.</p> |
| <p>Drivers</p> | <ul style="list-style-type: none"> - Pakistan ranks among the top 10 countries in the world most impacted by the loss of biodiversity and ecosystem services (BES): loss of vegetation cover has exacerbated soil degradation and diminished its water- retention capacity; unmanaged grazing has put stress on rangelands; the expansion of crop areas has destroyed ecosystem services and its ability to mitigate floods; and the excessive use of chemical fertilizers and pesticides has damaged soil fertility and biodiversity and contaminated ground water. All of these issues are compounded by extremely high levels of environmental pollution due to a lack of waste management infrastructure, unplanned urban sprawl, and unchecked pollution from industrial processes - The impacts of climate change on Pakistan's natural capital are likely to be severe. | |

- Loss of **vegetation cover** including shrubs and forest over the past few decades carries large environmental and biodiversity costs and impact numerous ecosystem services, including regulation of waterflow, the conservation of soil, protection from land erosion, the conservation of biodiversity and carbon sequestration (0.5 ton per ha per year). The extreme climate vulnerability of the food system to the loss of natural vegetation cover and the associated regulation of water flows was highlighted in the catastrophic floods of 2022.
- Agricultural growth has been driven by the **intensification of water, fertilizer, and pesticide use**, and by bringing **new land under cultivation**. This process is rapidly approaching its natural limits. It is under stress from environmental degradation and the increasing need of water and land for non-agricultural uses
- **Agriculture-linked degradation** is pushing water and land resources beyond the threshold of safe use and causing ecosystem decline across landscapes. **Some 35 percent of irrigated land is waterlogged and 30 percent highly saline**, making it unfit for agricultural production. Uneven, inefficient, and excessive use of **synthetic fertilizer**, dominated by urea (nitrogen), has culminated in soil nutrient imbalances and low levels of soil organic matter.
- **Fisheries:** the formerly productive Indus Delta marine fisheries have been reduced in productivity. Marine and inland fisheries could add more value to the agri-food system, but with the degradation of wetlands and marine-coastal ecosystems, the resource is unsustainable.
- While the area of **mangrove forests** initially shrunk, they are now being actively replanted and expanded. The annual cost of environmental damage to the delta is estimated at between US\$1 billion and US\$2 billion.
- **Unmanaged grazing** together with **fuel wood harvesting** is impairing the health of rangelands and diminishing a wide range of other critical ecosystem services, including the regulation of water flow, the conservation of soil and biodiversity, protection from land erosion, and carbon sequestration. Rangelands and forests combined contribute services estimated at 13 percent of GDP. But rangeland productivity has slumped to just 20–50 percent of its potential, and it is estimated that 25 million ha of land are degraded, impacting a range of other ecosystem services.
- **Inefficient and wasteful use of water**, environmentally damaging **agronomic practices and crops**, and inadequately developed **value chains** have diminished the agriculture-food system's contribution to sustainable growth, poverty reduction, and food security.
- **Water and food:** maintaining the current levels of groundwater overuse in agriculture will limit its role as a buffer during water-scarce and drought years. About one-tenth of current irrigation withdrawals—12 billion cubic meters (BCM)—will need to be reallocated in the next three decades. The performance of the Indus Basin Irrigation System (IBIS) will be a critical lever for that. Stored groundwater in the Indus Basin is a buffer against low precipitation, unreliable surface water flows, and drought. The need for this will increase with rising temperatures and irregular precipitation patterns, but unregulated pumping is threatening the resource, creating depletion and salinity.

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| | <ul style="list-style-type: none"> - Low density urban sprawling – the average city has grown spatially at 6.8 percent annually but at just 1.9 percent in population. Low-density expansion leads to the transformation of agricultural land into peri-urban land. - A further loss of ecosystem services is likely due to climate change, while demand for these same services will increase because of population growth, economic growth, and urbanization | |
| Nature impacts | Mention of biodiversity impacts, but little specifics. Notes that excessive pesticide application (especially for cotton) harms biodiversity. High surface water withdrawals and polluted return flows affect river ecology and reduce the water available for downstream environmental use | |
| Nature-related opportunities for livelihoods, jobs and growth | <ul style="list-style-type: none"> - Pakistan is endowed with considerable renewable natural capital, equivalent to an estimated 13-15% per capita wealth but much of it is at risk. - The national emphasis on building climate resilience through NBSs provides an entry point for scaling up water management and climate-smart practices. Regenerative agriculture and livestock management focuses on improving farm and rangeland productivity through practices that reverse soil degradation and increase biodiversity. - The increase in soil organic carbon (SOC) enhances soil's water-holding capacity and hydrological function, as well as its resistance to temperature extremes, floods, and droughts. Regenerative practices can therefore increase agricultural productivity and exports while reducing the need for irrigation water and purchased chemical inputs. A shift to a climate smart regenerative agri-food system thus has enormous potential for enhancing farm incomes and reducing rural poverty. It could also contribute significantly to reducing GHG emissions - Lower levels of pollution would improve health outcomes, with associated gains in labour productivity and household income from fewer lost days of work, lower healthcare costs, and lower costs of production. | |
| Nature-based solutions | <p>No comprehensive analyses or quantification of nature-based solutions</p> <ul style="list-style-type: none"> - Notes that there is a strong emphasis on nature based solutions (NBS) within national policy – see above. - Mentions Ten Billion Tree Tsunami Program (TBTTP), a four-year project that will have the quadruple benefits of natural capital restoration, carbon sequestration, and livelihood improvements, especially for poor households. - Highlights that NBSs should be prioritized in all urban areas with wide benefits: carbon sequestration, local climate regulation, and the reduction of air pollution, enable adaptation, cool down UHIs, relieve water scarcity, and lessen flood risk by facilitating thermal regulation, rainwater harvesting, and stormwater management. Floodplains and bypasses, inland wetlands, stream beds and banks, and upland forests can help regulate river flow. | |

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| Synergies and trade-offs nature, adaptation and mitigation | <ul style="list-style-type: none"> - AFLOU (Agriculture, Forestry and Other Land Use) contribute 46% of annual GHG emissions. - Expanding the forest cover to 15 percent of total land cover (or 16 billion trees) through the TBTP (6 percent forest cover) could achieve a total sequestration of 800 million MtCO₂e between 2020 and 2040. - Pakistan has the world's fifth-largest beef herd and produces 6 percent of the world's milk supply | |
| Treatment of international risks | <ul style="list-style-type: none"> - Vulnerability to global prices – e.g. rising global commodity prices in 2022 - have exacerbated the macro-fiscal risks facing the economy and highlighted its underlying structural fragility | |
| Policy | <ul style="list-style-type: none"> - Recognizes that ecosystem and landscape restoration is a foundational necessity that needs to be a policy and investment priority. Without it, the natural capital required to sustain an agri-food transformation will not exist. - Emphasis on the role of policy reforms e.g. to incentivise water conservation and increase water use efficiency in the agricultural sector and a shift away from water thirsty crops as well as better environmental management. - High priority adaptations in the NDC 2021 incorporate natural capital: ‘Recharge Pakistan Program’ (including enhancing water recharge at six sites in the Indus and strengthening vulnerable ecosystems) and expanding protected areas. The NDC has commits the government to continue investments in nature-based solutions (NBSs) such as the Ten Billion Tree Tsunami Program (TBTP). - Investment in water management and regenerative and climate-smart agriculture (CSA) practices could reverse the decline in productivity and enhance the viability of the agri-food system by revitalising the degraded ecosystems on which it depends. - Better Cotton Initiative (BCI) has helped 400,000 BCI-licensed farmers (30 percent of cotton farmers) to save 15 percent of irrigation water, reduce pesticide use by 10–15 percent, and cut GHG emissions in half. - Key policy priority on reforming harmful subsidies - Densification of secondary cities is a key to managing climate risks and improving livelihoods. Most Pakistani cities are experiencing lower-density expansion on their fringes | |
| Financing | <ul style="list-style-type: none"> - Discussion of large and unproductive subsidy regimes in the energy, agriculture, and irrigation sectors, which underlie the chronic fiscal stress faced by the country | |

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| | <ul style="list-style-type: none"> - Notes that the agri-food system is awash with inefficient, costly, inequitable subsidies that are an economic burden and create a distorted incentive structure, which plays a significant role in the sector's poor performance. In recent years, direct and indirect subsidy support to agriculture and irrigation in Punjab and Sindh has amounted to about US\$2.2 billion to US\$2.7 billion in public spending per year. This includes direct subsidy programs, tax relief for inputs, import and export subsidies, and revenue gap financing. structure of the irrigation tariff (abiana) provides no incentive for conserving water. - Distortions in groundwater management. Unsustainable usage is encouraged by the absence of regulations to limit extraction. The electricity tariff subsidy for tubewells compounds the problem - Excessive fertilizer use in agriculture is driven by distortionary and outdated policies and subsidies that were initially introduced to lower production costs and food prices. Today, they deliver negligible monetary benefit to households, degrade resources, generate high GHG emissions, and impose a heavy fiscal burden on the government. Costs US\$1.1 billion per year through subsidized natural gas, tax relief, and import subsidies. Disincentivises balanced and efficient use of chemical fertilizers and switch to alternatives. - Notes need and opportunity to strengthen green finance frameworks, but no mention of nature. E.g. the adoption of globally accepted environmental and social risk management (ESRM) systems is very low, and there is a lack of institutional capacity at the regulatory, sectoral, and corporate levels. It recommends Guidelines and mandating their adoption to allow the banking sector to develop much-needed ESRM framework | |
| Quantified analyses | Quantification of flood, drought and heat impacts due to physical climate change does not include scenarios related to environmental degradation. | |
| GEDSI | <p>The report makes a socio political and economic analysis linked to climate change and it emphasizes on the link between poverty, social exclusion and climate change. While many issues will be analogous for nature, this isn't explicitly drawn out in general. For example:</p> <ul style="list-style-type: none"> • The report affirms that those people who are dependent on rainforest and biodiversity resources, face increased poverty due to droughts and heatwaves. • The report mentions that the conflict–climate change nexus in DRC manifests in two main ways: conflict-affected persons, especially women and girls, are particularly vulnerable to climate change impacts; second, climate impacts often compound the drivers of conflict, leading to a further entrenchment of the conflict cycle. • In several sections the report uses the GEDSI approach. It affirms that in DRC the rural and urban poor, women and children, indigenous peoples, and people with disabilities all have heightened vulnerability to the negative impacts of climate change. | |

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| | <ul style="list-style-type: none"> • The report highlights that women are particularly vulnerable to climate change, as they struggle to secure agricultural incomes due to educational, financial, and government service access disparities. • The report recognizes the valuable traditional knowledge and practices of indigenous people for climate mitigation and adaptation, with indigenous women playing a key role in preserving this traditional knowledge • The report mentions the increasing climate change displacement and involuntary migration and the related risks such as deepening impoverishment, exploitation, and sexual violence. There is a need to strengthen efforts to prevent and respond to GBV, particularly during periods of climatic stress <p>community governance engagement (local representatives, women, and socially excluded groups) to increase</p> <p>transport improvement using climate resilient standards may all need to be adjusted to ensure that they can</p> | |
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MALAWI

| Area | Integration of Nature | Comments |
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| <p>Nature-related risks.</p> <p>Critical sectors analysed</p> | <ul style="list-style-type: none"> - Land degradation is flagged as a major risk, especially soil erosion. It is represented as a major threat to agriculture and water infrastructure but is examined mainly in terms of its implications for crop yields, water storage, and hydropower reliability. E.g., About 80% (7.7 million hectares) of Malawi’s land area is estimated to be in need of restoration. - Flood and drought risks are intensifying, threatening agriculture (particularly rainfed crops), disrupting infrastructure, and impacting ecosystem services. - Water scarcity and lowered water quality (due to runoff, soil erosion) undermine resilience. | <p>Well-covered.</p> <p>Risks are often discussed individually across sectors, especially in agriculture and infrastructure.</p> |

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| Drivers | <ul style="list-style-type: none"> - Deforestation and overreliance on wood fuels: over 97% of households use biomass (firewood, charcoal) for cooking, contributing to forest loss and degradation.²⁰ - Unsustainable agricultural practices (e.g., low-input, single rainfed season, minimal soil and water conservation) exacerbate soil erosion, deplete fertility. - Increasing population pressure on land, coupled with limited urbanization, drives expansion into marginal lands. | Well-covered. Strong links to energy, agriculture, and demography. |
| Nature impacts | <ul style="list-style-type: none"> - Soil erosion has a major negative effect on agricultural yields and watershed functions. - Watershed degradation leads to sedimentation of rivers/reservoirs, affecting water supply and hydropower performance. - Forest and biodiversity loss not explicitly analysed in depth, but recognized as part of broader land-use change and degradation trends. | Moderately covered. |
| Livelihoods, jobs, and growth | <ul style="list-style-type: none"> - Agriculture remains the predominant livelihood (<u>over 70% of employment</u>), highly sensitive to land degradation and water scarcity. - Deforestation and degraded landscapes undermine productivity, food security, and labour incomes. - Climate stressors (e.g., heat stress, floods) adversely affect labour productivity, especially for poorer rural communities that rely on outdoor work. - The role of nature in underpinning livelihoods is well established, especially in rural areas. However, the CCDD does not elaborate on biodiversity-based economic opportunities (e.g. ecotourism, NTFPs). Links between restoration and job creation are implied but not quantified. | Moderately covered. |
| Nature-based solutions | <ul style="list-style-type: none"> - The Malawi CCDD clearly sees forest/land restoration as core to climate resilience, highlighting, <i>for example</i>, the Bonn Challenge pledge to restore 4.5 million hectares.²¹ However, the document notes that NBS projects have not yet been fully integrated or funded at scale. - CCDD emphasizes the importance of landscape restoration (e.g., <u>soil and water conservation, agroforestry, forest management</u>) for increasing resilience. - Watershed rehabilitation (protecting upstream forests, wetlands) is noted as critical for reducing flood risk, ensuring reliable hydropower, and improving water availability. | Well-covered. Nature-based solutions are well covered, especially in rural and watershed contexts. |

²⁰ The Sustainable Development Report data dashboard estimates that 1.9 percent of the population has access to clean cooking fuels and stoves:

²¹ Efforts to restore 4.5 million hectares under the Bonn Challenge and the African Forest Landscape Restoration Initiative, along with policies to reduce the dependence on biomass, could increase carbon stocks by 148 Mt by 2050, equivalent to about 24 percent on average of the total projected emissions for Malawi under current policies by 2050.

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| | | Implementation, governance, and financing constraints are acknowledged. |
| Synergies and trade-offs nature, adaptation and mitigation | <ul style="list-style-type: none"> - The CCDR presents relatively good alignment with adaptation and mitigation via improved land management, reforestation, and agroforestry. - Land restoration can both reduce emissions (through carbon sequestration) and enhance resilience (better soil fertility, reduced flood risks). - Protecting forests and wetlands secures water regulation services that protect infrastructure. - Emissions from Malawi are low, but LUCF (land use change and forestry) remains a significant source, meaning forest protection and restoration are major mitigation options. - Trade-offs (e.g., potential loss of farmland in short term) noted, but emphasis is on co-benefits for productivity and resilience. | Moderately/well-covered. |
| Treatment of international risks | <ul style="list-style-type: none"> - Global decarbonization could affect Malawi's mining sector (both opportunities for minerals for clean tech and potential environmental risks). - International demand for carbon offsets is discussed as a possible avenue to finance forest/land restoration. - Regional energy trade (Southern Africa Power Pool) can enhance resilience but may shift land-use dynamics for new infrastructure. - Mentions are brief and mostly revolve around potential climate finance (voluntary carbon markets) and cross-border power interconnections. | Limited inclusion. |
| Policy | <ul style="list-style-type: none"> - Malawi's main policy frameworks (e.g., MGDS III, Malawi 2063) acknowledge land restoration and natural resource management as priorities. - The updated Nationally Determined Contribution (NDC) and the National Adaptation Plan (NAP) identify restoration of forests and degraded lands as core mitigation-adaptation strategies. - Efforts to improve governance (land tenure reform, forest law enforcement) are deemed crucial. - Policy intent is strong, with clear alignment across national and climate plans. However, the CCDR highlights significant implementation gaps, weak coordination, and lack of enforcement particularly at subnational levels. Biodiversity policies are less visible. | Moderately/well-covered. |
| Financing | <ul style="list-style-type: none"> - The CCDR highlights carbon finance (e.g., forest carbon credits), global climate funds, and results-based financing as options. - Carbon finance potential (additional carbon sequestered that could be linked to the voluntary carbon markets) Land restoration investments will create opportunities for carbon credits but will require targeting | Moderately covered. |

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| | <p>investments in the watershed to optimize carbon capture. Analysis done for this CCDR has shown that the potential value of additional carbon sequestered that could be linked to the voluntary carbon markets ranges from US\$24.8 million to US\$74.3 million per year if Malawi meets forest/land restoration targets (depends on global carbon price).</p> <ul style="list-style-type: none"> - Urges the use of public-private partnerships, climate funds, and innovative schemes (e.g., payment for ecosystem services) to fill financing gaps. - The CCDR also emphasizes that halting degradation now is less costly than delaying action. - Malawi's fiscal space is constrained by high public debt and limited domestic revenue. - Notes the importance of private sector participation, possibly through PPPs in watershed restoration, reforestation, or sustainable charcoal production. | <p>However, private sector mobilization is discussed conceptually but not well developed.</p> |
| <p>Quantified analyses</p> | <ul style="list-style-type: none"> - Quantification focuses on emissions, flood risk, and yields. Nature-specific valuations (e.g. biodiversity, tourism, pollination) are missing. Figure 5 (page 40) shows the projected economic loss due to climate change, with land degradation a core driver of damages. (In the high-emissions scenario (RCP8.5), in 2050, increased land degradation and climate change impacts combined increase losses by almost 25 percent.) | <p>Limited inclusion.</p> |
| <p>GEDSI</p> | <ul style="list-style-type: none"> - The report recognizes that the poorest households, that rely on agriculture and informal labour, will be disproportionately affected by climate change (drought and floods), which will further reduce their incomes. - Climate-related disasters can push affected people into poverty. A GEDSI perspective is needed to address Disaster Risk Management. - Women and girls in Malawi are particularly vulnerable to climate shocks. The report informs the findings of a 2018 study: temperature-related shocks affected overall household consumption, food consumption, non-food consumption, and caloric intake more in households in which the land was managed solely by women than in those households in which the land was managed by men or managed jointly. - It is of extreme importance to halt and reverse land degradation. Malawi needs to reduce the pressure on forests from the collection of firewood and the production of charcoal. This requires accelerating the transition to clean and efficient cookstoves and instituting a forest management certification scheme to increase sustainably sourced firewood and charcoal. This would foster forest protection, reduce indoor air pollution and bring important health benefits, particularly to women, girls, and children. | |

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| | <ul style="list-style-type: none">- Women and girls in Malawi face significant disadvantages that hinder their ability to accumulate human capital and rise out of poverty: high fertility rate, high levels of teenage pregnancy and marriage, and inadequate access to reproductive healthcare and family planning are key factors.- The report presents data that show the disadvantages women face in education, employment, productivity and access to information and technology.- In the carbon capture proposals, the report recommends an ecosystem services-based approach in the watershed management guidelines. There is no reference to GEDSI. | |
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Annex 2: Methodology for screening assessment

A structured text analysis approach is applied to systematically assess the inclusion of nature-related themes across CCDRs.

Selection of CCDRs

The analysis includes all 71 CCDRs available on the official [World Bank website](#)¹, ensuring broad representation across multiple dimensions. Reports cover regions including Africa, Asia, Latin America, Europe, the Middle East, and Small Island Developing States (SIDS) to account for regional variations. The selection spans agriculture-driven, energy-intensive, and service-oriented economies, facilitating sectoral comparisons.

Extracting and Analyzing Text

Each CCDR is processed using automated text analysis techniques to identify relevant references to nature, climate, economy, and social inclusion. The objective is to determine the extent to which CCDRs explicitly discuss key themes, ensuring consistency and comparability across reports.

Evaluating Key Themes

The reports are then assessed against the questions outlined in the Terms of Reference (ToR). Each overarching question and its corresponding sub-questions are analysed separately, preventing overlap between categories. A thematic keyword framework guides this process, ensuring that key concepts such as nature-related risks, economic dependencies, and policy alignment are consistently captured.

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| <p>Nature-Related Risks, Dependencies, Impacts, and Opportunities:</p> <p>This framework evaluates how CCDRs integrate nature-related risks and dependencies into economic and</p> | <ul style="list-style-type: none">○ Economic Risks: Assesses threats such as reduced agricultural productivity, fiscal instability, rising insurance costs, disrupted supply chains, infrastructure damage, displacement, crop yield declines, and economic losses from extreme weather events. <i>(Category: Q1 Nature Risks - Economic)</i>²○ Social Risks: Evaluates livelihood loss, climate migration, food insecurity, public health crises, water contamination, disaster vulnerability, and mental health effects from environmental degradation. <i>(Category: Q1 Nature Risks -</i> |
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| <p>social planning, while identifying opportunities for sustainable development</p> | <p><i>Social)</i></p> <ul style="list-style-type: none"> ○ Opportunities: Identifies green economy prospects, eco-tourism, sustainable agriculture, carbon farming, circular economy solutions, nature-based enterprises, and financing models for ecosystem restoration. <i>(Category: Q1 Nature Opportunities)</i> ○ Impacts²²: Analyses biodiversity collapse, habitat destruction, declining fish stocks, marine ecosystem toxicity, coral bleaching, forest dieback, and species extinction risks. <i>(Category: Q1 Nature Impacts)</i> |
| <p>Drivers of Nature Loss and Resilience Building</p> | <ul style="list-style-type: none"> ○ Key drivers of environmental degradation, including land-use change, pollution, resource exploitation, and invasive species are assessed, while capturing CCDR strategies for mitigating degradation. Importantly, we also evaluate if resilience benefits are incorporated, particularly for marginalized and vulnerable communities, ensuring an inclusive approach to adaptation. <i>(Category: Q1.1 Drivers Nature Loss / Q1.2 Resilience Benefits / Q1.2 Vulnerable Groups)</i> |
| <p>Nature-Based Economic Growth and Equitable Access</p> | <ul style="list-style-type: none"> ○ NbS contribute to climate adaptation and mitigation while also creating economic opportunities in forestry, conservation, and sustainable agriculture. This assessment evaluates how CCDRs integrate green jobs and NbS industries, and whether barriers to access prevent equitable distribution of benefits across social and economic groups. <i>(Category: Q2 Nature Based Economy / Q2 Access Barriers)</i> |
| <p>Integration of Nature and Climate Risks in Macroeconomic Assessments</p> | <ul style="list-style-type: none"> ○ Macroeconomic modelling plays a crucial role in shaping climate policy. This methodology assesses whether CCDRs incorporate nature-related risks into GDP and economic impact assessments, ensuring biodiversity loss and ecosystem degradation are factored into national economic strategies. <i>(Category: Q3 Integrated Assessments in GDP Assessment)</i> |
| <p>Synergies, Trade-offs, and Financial Viability</p> | <ul style="list-style-type: none"> ○ Balancing climate adaptation, mitigation, and economic development while maintaining ecological integrity |

²² The differentiation between risks and impacts is intentional: risks refer to consequences for human systems (economic and social), while impacts capture the degradation of natural systems themselves (like biodiversity loss or coral bleaching), which may not be immediately framed as "risks" in the CCDRs but are often precursors

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| | <p>presents policy challenges. This assessment examines how CCDRs address synergies and trade-offs, identifying financially viable nature-based solutions that align with broader development goals. <i>(Category: Q4 Synergies / Q4 Trade Offs / Q4 Financial Viability)</i></p> |
| <p>International Risks and Market Implication</p> | <ul style="list-style-type: none"> Given the global nature of trade and finance, this methodology explores how CCDRs address cross-border risks, commodity price shocks, and market responses to environmental changes. Understanding these linkages is key to designing climate-resilient economic policies. <i>(Category: Q5 Global Economic Shocks / Q5 Cross Border Non-Economic Risks / Q5 Market Responses)</i> |
| <p>Nature-Climate Feedback Loops and Ecosystem Interactions</p> | <ul style="list-style-type: none"> The framework examines how CCDRs incorporate ecosystem-climate interactions, reinforcing feedback loops, and potential ecological tipping points to ensure a comprehensive understanding of cascading environmental risks. <i>(Category: Q6 Feedback Loops / Q6 Tipping Points / Q6 Ecosystem Interactions)</i> |
| <p>Integration of Nature-Based Solutions (NbS) into Policy and Planning</p> | <ul style="list-style-type: none"> NbS are increasingly recognized as cost-effective approaches to climate resilience, emissions reduction, and sustainable development. This methodology assesses how CCDRs integrate NbS across terrestrial, coastal, and urban settings, and their contribution to adaptation and mitigation strategies. <i>(Category: Q7 NbS (various subcategories))</i> |
| <p>Policy Alignment and Engagement with International Financial Institutions</p> | <ul style="list-style-type: none"> Successful mainstreaming of nature-based strategies requires alignment with NDCs, NAPs, and NBSAPs. The assessment also reviews CCDRs' engagement with International Financial Institutions (IFIs) and development partners, ensuring coherence with global climate financing mechanisms. <i>(Category: Q8 NDCs NAPs / Q8 Policy Integration / Q8 IFIs Engagement)</i> |
| <p>Forestry, Ecosystem Services, and Carbon Markets</p> | <ul style="list-style-type: none"> For forested economies, the methodology examines the role of forests in job creation, carbon sequestration, and economic resilience, while assessing how ecosystem services are valued and integrated into economic planning. <i>(Category: Q9 Forestry Jobs / Q9 Carbon Sequestration / Q9 Ecosystem Services)</i> |

| | |
|---|--|
| Financing Mechanisms, Gaps, and Investment Priorities | <ul style="list-style-type: none"> ○ Effective nature-based strategies require adequate financing mechanisms. This assessment identifies funding gaps, explores existing financial frameworks, and evaluates the integration of innovative financing mechanisms such as green bonds, blended finance, and ecosystem service payments. <i>(Category: Q10 Financing Mechanisms, Gaps, Priorities)</i> |
| Gender Equality, Social Inclusion, and Marginalized Groups (GEDSI) | <ul style="list-style-type: none"> ○ Recognizing that nature-related risks and opportunities affect different social groups unequally, this methodology assesses how CCDRs incorporate gender equality and social inclusion. It evaluates whether policies protect vulnerable populations and promote inclusive economic and social outcomes. <i>(Category: Q11 GEDSI)</i> |

Applying a Traffic Light Scoring System

To provide a consistent and measurable evaluation, a traffic light system is used to classify the extent of coverage for each theme in the CCDRs:

| Score | Meaning |
|---------------------------|--|
| Well Covered | <i>The topic is frequently discussed (>10 times per 1000 words)</i> |
| Moderately Covered | <i>The topic is mentioned but not in depth (2-10 times per 1000 words)</i> |
| Weak or Absen | <i>The topic is missing or barely mentioned (<2 times per 1000 words)</i> |

Refinement and Validation Process

To enhance the accuracy and reliability of the text analysis, keywords were iteratively refined to ensure comprehensive identification of nature-related risks, opportunities, and policy integration. A validation process cross-checked automated findings against a sample of CCDRs, with manual reviews refining scoring thresholds and minimizing the risk of undercounting relevant content. Natural language processing (NLP) techniques were also applied to systematically classify key themes based on presence, frequency, and contextual relevance, enabling a consistent and objective assessment across reports.

By integrating automated analysis with expert validation, this methodology offers a

rigorous, transparent, and replicable approach to evaluating the inclusion of nature-related considerations in CCDRs.

Limitations

- Some CCDRs did not quantify ecosystem service contributions, limiting economic valuation comparisons.
- Financing mechanisms for NbS were inconsistently detailed, making cross-country financial assessments difficult.
- Biodiversity and ecosystem protection strategies were often implicit, requiring inference from sectoral policies.
- Feasibility of nature-based policies given financial, governance, and socio-economic constraints. (For example, Yemen and Zimbabwe faced governance barriers limiting NbS implementation).

Areas for Improvement

- Developing a standardized NbS assessment index to compare across CCDRs.
- Linking climate vulnerability indices with nature-based investment needs.
- Quantifying the avoided economic losses from NbS adoption to strengthen cost-benefit analyses

Table 5. NLP Keywords²³

| To what extent are nature-related risks, dependencies, impacts and opportunities incorporated in the CCDRs? | |
|---|--|
| Q1 | <p>Q1 Nature Risks Economic: reduced agricultural productivity, fiscal risks, rising insurance costs, supply chain disruptions, infrastructure damage, desertification-driven displacement, land degradation and poverty, crop yield declines, loss of arable land, soil erosion and flooding, disruptions to fisheries and aquaculture, economic losses from extreme weather, increased energy costs due to climate variability, financial instability from ecosystem collapse</p> <p>Q1 Nature Risks Social: loss of livelihoods, climate migration, increased food insecurity, public health crises from contamination, toxic exposure, heavy metal poisoning, groundwater contamination, disaster risks, extreme weather vulnerability, flood risks, flooding, waterborne diseases, heat-related illnesses, displacement due to ecosystem degradation, mental health stress from environmental disasters</p> <p>Q1 Nature Opportunities: green economy, nature-based jobs, sustainable livelihoods, eco-tourism, rewilding, blue economy, sustainable agriculture, nature-positive investments, climate adaptation financing, ecosystem restoration funding, nature-based enterprises, sustainable land management, carbon farming, agroforestry for soil health, flood resilience infrastructure, circular economy solutions, nature-based insurance models, bioengineering for climate resilience, biodiversity and resilience, ecosystem-based adaptation, nature-positive solutions, soil carbon sequestration, soil moisture retention, flood mitigation</p> <p>Q1 Nature Impacts: biodiversity collapse, biodiversity loss, habitat loss, marine ecosystem toxicity, declining fish stocks, ecosystem degradation, coral bleaching, forest dieback, pollinator decline, wetland degradation, species extinction risk, loss of keystone species</p> |
| Q1.1 | <p>Drivers of nature loss e.g. Land-use change, pollution, exploitation of natural resources, invasive species, and the impacts on different groups of people</p> <p>Q1.1 Drivers Nature Loss: land-use change, deforestation, desertification, pollution, overfishing, resource extraction, overextraction, invasive species, habitat fragmentation, agricultural expansion, intensive agriculture, unsustainable land practices, loss of keystone species, fertilizer runoff, chemical waste, industrial discharge, toxic spills, plastic pollution</p> |
| Q1.2 | <p>To what extent do CCDRs capture the benefits of avoiding environmental degradation for resilience? i.e. resilience built via avoiding pollution (beyond just deforestation). Does this consider building resilience for marginalised groups?</p> <p>Q1.2 Resilience Benefits: clean air pollution, clean water pollution, disaster resilience, disaster resilience through ecosystem protection, wetland loss conservation, climate adaptation, soil restoration, bioremediation, pollution filtration, phytoremediation, nature-based pollution control, natural flood management for disaster risk reduction, natural flood management, nature-based pollution control in urban areas, natural flood management for disaster risk reduction, nature-based cooling solutions, tree canopy cooling, green infrastructure for urban cooling</p> |

²³ Keyword-based text analysis is driving most of the results, also identifying the relevant sections. This is then complemented by an NLP component that helps interpret the context and meaning within those sections.

Q1.2 Vulnerable Groups: marginalized communities, indigenous populations, rural poor, women, smallholder farmers, displaced communities, children, disabled, girls, inclusive green growth

To what extent do CCDRs explore development and economic growth opportunities related to nature? Does this consider who is able to access these opportunities and who might face barriers in accessing these opportunities?

Q2 Nature Based Economy: eco-tourism, green jobs, regenerative agriculture, sustainable forestry, circular economy, bioeconomy, biodiversity-driven economy, forest-based economy, blue economy, marine-based economy, carbon farming, landscape restoration economy, watershed protection economy, carbon markets, payment for ecosystem services

Q2 Access Barriers: barriers to nature-based economy, barriers to biodiversity finance, limited access to nature investments, inclusive green growth, nature-positive financial access, policy incentives for nature economy, land tenure rights for conservation, community participation in nature conservation, local community access to nature finance, barriers to nature-based solutions implementation, equitable access to green jobs, marginalized groups in nature finance, nature-based employment barriers

To what extent is the relationship of climate and nature-related risks incorporated into impact assessments including headline Gross Domestic Product (GDP) impact numbers?

Q3 Integrated Assessments in GDP Assessment: climate-economy modelling, macroeconomic projections, cost-benefit analysis, natural capital accounting, ecosystem services valuation, economic cost of nature-based adaptation, impact of ecosystem degradation on GDP, forest loss and carbon market dynamics, economic returns from conservation

To what extent do CCDRs address the synergies and perceived trade-offs between nature, adaptation, mitigation and inclusive development? What are the economically and financially viable solutions?

Q4 Synergies: nature-based adaptation, ecosystem services and adaptation, nature-climate synergies, forests and carbon storage, wetlands for flood mitigation

Q4 Trade Offs: land competition, food security, conservation, deforestation, biodiversity loss and economic growth, climate trade-offs in land use, nature-based solutions vs. infrastructure development

Q4 Financial Viability: cost-effectiveness, investment returns, blended finance, carbon markets and reforestation, ecosystem service payments, nature-positive economic models, green finance for ecosystem restoration

To what extent do CCDRs address the potential for international risks associated with climate and nature (e.g. global commodities shocks, changing in demand etc)

Q5 Global Economic Shocks: commodity price volatility, food security, agricultural supply chains, nature-related supply chain disruptions, climate shocks to global trade, deforestation-driven commodity risks, global markets and biodiversity loss, climate-driven trade disruptions, ecosystem collapse and trade impacts, critical supply chains and climate risks

Q5 Cross Border Non Economic Risks: transboundary pollution, illegal wildlife trade, climate migration, cross-border water conflicts, regional biodiversity loss and ecological instability, nature-driven fragility and instability, ecosystem degradation and geopolitical tensions, climate-driven displacement, forest loss and regional conflicts, biodiversity loss and regional security threats

Q5 Market Responses: carbon border adjustment mechanisms (CBAMs), trade restrictions, nature-based trade policies, geopolitical instability and environmental policies, global value chains and biodiversity, financial risks from deforestation-linked trade, carbon pricing and international markets, climate-linked financial fragility, nature-positive trade agreements, regional risks in sustainable resource management

To what extent and how are nature-related feedbacks considered and integrated which could significantly amplify climate impact estimates?

Q6 Feedback Loops: deforestation feedbacks, peatland degradation, wildfire-carbon feedbacks, ocean deoxygenation, soil carbon loss, land-use feedbacks, boreal forest decline, wetland methane release, bio geophysical feedbacks, savannization of rainforests, boreal forest shift, hydrological cycle intensification

Q6 Tipping Points: permafrost thaw, amazon dieback, coral reef collapse, ice sheet melt, Atlantic meridional overturning circulation (AMOC) slowdown, west Antarctic ice sheet collapse, Greenland ice sheet loss, tropical forest collapse, Siberian permafrost thaw, deep ocean circulation disruption, arctic amplification, permafrost carbon release

Q6 Ecosystem Interactions: carbon sinks, compound risk, natural buffers, hydrological cycles, vegetation-atmosphere feedback, biogeochemical cycles, terrestrial carbon flux, marine biological pump, forest-climate feedbacks, soil moisture-climate interactions, land-ocean carbon exchange, desertification-climate feedback, climate-biodiversity interactions, cryosphere-climate linkages

What Nature based solutions feature in the analysis and how do they contribute to development, mitigation and adaptation goals.

Q7 NbS Terrestrial Ecosystem Restoration: reforestation, afforestation, agroforestry, silvopasture, regenerative agriculture, sustainable land management, forest landscape restoration

Q7 NbS Coastal and Marine Protection: mangrove restoration, coral reef restoration, blue carbon solutions, living shorelines, nature-based coastal protection

Q7 NbS Wetland and Freshwater Solutions: wetland restoration, peatland restoration, riparian buffer zones, natural flood management

Q7 NbS Urban and Infrastructure-Related: urban green infrastructure, eco-engineering for resilience

Q7 NbS Benefits Mitigation: carbon sequestration, pollution filtration, improved soil health

Q7 NbS Benefits Adaptation: disaster risk reduction, flood mitigation, coastal erosion control, microclimate regulation

Q7 NbS Benefits Development: water retention, biodiversity conservation, habitat restoration for endangered species, ecosystem resilience, temperature regulation in urban areas, pest control through biodiversity, enhanced water quality, soil stabilization

Q7 NbS Financing: green bonds, carbon markets, public-private partnerships, biodiversity credits, payment for ecosystem services (PES), climate adaptation finance, blended finance for NbS, sustainable forestry investments, NbS venture capital funding, corporate natural capital investment, conservation trust funds, results-based climate finance, sovereign sustainability-linked bonds, nature-positive investment frameworks

How can CCDRs support the development and delivery of coordinated and aligned Nationally Determined Contributions (NDCs),

National Adaptation Plans (NAPs) and National Biodiversity Strategies and Action Plans (NBSAPs)? This could include how examining how well the CCDRs are currently operationalized in national planning processes and by other international finance institutions (IFIs) and development partners.

Q8

Q8 NDCs NAPs: National Adaptation Plans (NAPs), Nationally Determined Contributions (NDCs), National Biodiversity Strategies and Action Plans (NBSAPs), Biodiversity strategy, climate-aligned biodiversity plans, integration of biodiversity in NDCs, nature-based commitments in national plans

Q8 Policy Integration: cross-sectoral coordination, mainstreaming biodiversity, integration of nature in climate policy, ecosystem-based governance, national nature strategy, environmental policy alignment, biodiversity and climate adaptation policies

Q8 IFIs Engagement: development partner coordination, climate finance mobilization, biodiversity finance in international policy, World Bank and nature finance, multilateral biodiversity initiatives, alignment of CCDRs with environmental treaties, global environmental policy and climate action

For forested countries, what are the links between forestry, jobs, mitigation and resilience (including for marginalised groups) and how does this link to key ecosystem services?

Q9

Q9 Forestry Jobs: sustainable forest management, community forestry, green jobs, forest-dependent livelihoods, indigenous forestry practices, non-timber forest products, timber certification programs, forest conservation employment, smallholder forestry, nature-based employment, forest restoration workforce, biodiversity-friendly agriculture

Q9 Carbon Sequestration: REDD+, afforestation, carbon credit markets, forest carbon sinks, carbon sequestration potential, mangrove carbon storage, tropical forest mitigation, reforestation carbon benefits, forest soil carbon sequestration, forest-based carbon offsets, carbon-neutral forestry, landscape-scale carbon sequestration

Q9 Ecosystem Services: watershed protection, pollination services, erosion control, climate regulation, air quality improvement, flood prevention, drought resilience, biodiversity refuges, forest hydrology, microclimate stabilization, pest control by forest biodiversity, soil fertility enhancement, habitat connectivity, buffer zones for biodiversity conservation, riparian forest protection, forests and water security

What is the analysis of financing needs (e.g. focus is on land-use and forestry and no discussion of other natural capital at present).

Q10

Q10 Financing Mechanisms: green finance, blended finance, debt for nature swaps, sustainability-linked finance, sustainability-linked bonds, green bonds, resilience bonds, nature-positive investment, conservation finance, biodiversity credits, nature-based financial instruments, green banking, sovereign sustainability-linked finance.

Q10 Sectoral Focus: land-use finance, forestry investments, biodiversity finance, climate-resilient infrastructure investments, ocean and blue economy finance, natural capital investments, water conservation finance, ecosystem restoration funding

Q10 Gaps Priorities: investment shortfalls, adaptation finance, cost-benefit analysis, finance gap, nature-based finance deficit, lack of biodiversity investment, funding gap in conservation, limited access to resilience finance, challenges in scaling up nature finance, biodiversity

finance barriers, sustainable finance access for developing economies.

Q10 International Financing Initiatives: Resilience and Sustainability Facility (RSF), Resilience and Sustainability Trust (RST), multilateral development banks and nature finance, sovereign sustainability-linked finance, climate finance mobilization, public-private finance partnerships for nature, sustainable finance mechanisms in emerging markets, nature-focused financial policies.

(Extra)

Q11

Q11 GEDSI: Gender equality, women participation, indigenous rights, social inclusion, vulnerable communities, marginalized groups, displaced populations, rural poor, inclusive development, girls, gender-sensitive policies, children, disabled.

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Creation Date: 10/6/25 10:13:00 AM
Change Number: 4
Last Saved On: 10/6/25 10:26:00 AM
Last Saved By: Hilary Juries
Total Editing Time: 3 Minutes
Last Printed On: 10/6/25 10:26:00 AM
As of Last Complete Printing
Number of Pages: 102
Number of Words: 35,058 (approx.)
Number of Characters: 199,835 (approx.)