Measuring performance
in achieving SDG targets

GREEN GROWTH INDEX 2024

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Green Growth Index

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Acronyms and Abbreviations

AB	Access to Basic Services and Resources
ACBF	African Capacity Building Foundation
AF	Population-attributable Fraction
AfDB	African Development Bank
AFOLU	Agriculture, Forestry, and Other Land Use
AI	Artificial Intelligence
APEC	Asia-Pacific Economic Cooperation
ARO	Africa Regional Office
ASEAN	Association of Southeast Asian Nations
AU	African Union
AUC	African Union Commission
BAU	Business-As-Usual
BAFU	Federal Office for the Environment, Switzerland
BE	Biodiversity and Ecosystem Protection
BMR	Baseline Mortality Rate
BP	BP and Shift Energy Data Portal
CAID	Climate Action and Inclusive Development
CH_4	Methane
CGED	Centre for Green Economy Development
COP	Community of Practice
CO_2	Carbon Dioxide
CO_2eq	Carbon Dioxide Equivalent
COMESA	Common Market for Eastern and Southern Africa

COVID-19	Coronavirus disease
CPF	Country Planning Framework
CRA	Comparative Risk Assessment
CRF	Concentration-Response Function
CSAYN	Climate-Smart Agriculture Youth Network
CV	Cultural and Social Value
CW	Climate Watch
DALY	Disability-Adjusted Life Year
DRI	Development Research Institute
EA	Early Action
EAC	East African Community
EBD	Environmental Burden of Disease
EE	Efficient and Sustainable Energy
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African
EIA	U.S. Energy Information Administration
ENEA	Italian National Agency for New Technologies, Energy and Sustainable Economic Development
EQ	Environmental Quality
ESRU	Efficient and Sustainable Resource Use
EU	European Union
EW	Efficient and Sustainable Water Use
FAO	Food and Agriculture Organization of the United Nations
FEEM	Fondazione Eni Enrico Mattei

F-gas	Fluorinated gas
GAC	Global Affairs Canada
GB	Gender Balance
GCB	Global Carbon Budget
GCF	Green Climate Fund
GDP	Gross Domestic Product
GE	GHG Emissions Reduction
GEAPP	Global Energy Alliance for People and Planet
GEO	Green Economic Opportunities
GEP	Green Economy Progress
GESI	Gender Equality and Social Inclusion
GGGI	Global Green Growth Institute
GG-NAP	Green Growth National Action Plans
GGPM	Green Growth Performance Measurement
GGP&I	Green Growth Planning and Implementation
GGSim	Green Growth Simulation Tool
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GJ	Green Employment
GNI	Gross National Income
GN	Green Innovation
GRAP	Green Recovery Action Plan
GSAF	Green and Sustainable Agriculture Framework
GT	Green Trade
GV	Green Investment
GW	Gigawatt
Gwh	Gigawatt hours
HDI	Human Development Index
ICT	Information and Communication Technology
IEA	International Energy Agency
IHME	Institute for Health Metrics and Evaluation
ILO	International Labour Organization
IMF	International Monetary Fund
IPSD	Investment and Policy Solutions Division
IRENA	International Renewable Energy Agency
ISO	International Organization for Standardization
ITU	International Telecommunication Union
IUCN	International Union for Conservation of Nature
KG	Kilogram
Lao PDR	Lao People's Democratic Republic
LASES	Lao Academy of Social and Economic Science
LDCs	Least Developed Countries
LNG	Liquefied Natural Gas
LSB	Lao Statistics Bureau
LT-LEDS	Long-Term Low-Emission Development Strategy
LWU	Lao Women's Union
MAF	Ministry of Agriculture and Forestry
ME	Material Use Efficiency
MEM	Ministry of Energy and Mines
MERCOSUR	Mercado Común del Sur
MES	Ministry of Education and Sports
MF	Material Footprint
ML	Machine Learning
MOE	Ministry of Environment
MOFA	Ministry of Foreign Affairs
MOH	Ministry of Health
MOIC	Ministry of Industry and Commerce
MoICT	Ministry of Information, Culture and Tourism
MoLSW	Ministry of Labour and Social Welfare
MoNRE	Ministry of Natural Resources and Environment
MoPS	Ministry of Public Security
MOCCAE	Ministry of Climate Change and Environment
MPI	Ministry of Planning and Investment
MPI-DRI	MPI's Development Research Institute
MPWT	Ministry of Public Works and Transport
MSW	Municipal Solid Waste
$MtCO_2eq$	Metric tons of carbon dioxide equivalent
MTC	Ministry of Technology and Communication
N_2O	Nitrous Oxide
NAFTA	North American Free Trade Agreement
NAP	National Adaptation Plan

NBSAP	National Biodiversity Strategy and Action Plan
NCP	Natural Capital Protection
NCCAP	National Climate Change Action Plan
NDC	Nationally Determined Contributions
NDP	National Development Plan
NEET	Not in education, employment, or training
NERI	National Economic Research Institute
NGGS	National Green Growth Strategy
NGO	Non-governmental Organizations
NLP	Natural Language Processing
NSEDP	National Socio-Economic Development Plan
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OECS	Organisation of Eastern Caribbean States
OML Center	Oscar M. Lopez Center
PEFC	Programme for the Endorsement of Forest Certification
PES	Payment for Ecosystem Services
PFM	Public Financial Management
$PM_{2.5}$	Particulate matter with a diameter of less than 2.5 micrometers
PV	Photovoltaic
PS	Programmatic Solutions
R&D	Research and Development
RECs	Regional Economic Communities
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RR	Relative Risks
SAARC	South Asian Association for Regional Cooperation
SADC	Southern African Development Community
SC1	Alternative Scenario
SDG	Sustainable Development Goal
SDSN	Sustainable Development Solutions Network
SE	Social Equity
SEBE	Sustainable Environment and Blue Economy
SI	Social Inclusion
SL	Sustainable Land Use
SOs	Strategic Outcomes
SP	Social Protection
STB	ST Bank Laos
Sum4All	Sustainable Mobility for All
TCFP AU-GRAP	Transformative Climate Finance Program of the African Union Green Recovery Action Plan
UAE	United Arab Emirates
UHC	Universal Health Coverage
UN	United Nations
UN ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
UN COMTRADE	United Nations Commodity Trade Statistics Database
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UN ECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
UNICEF	United Nations International Children's Emergency Fund
UNIDO	United Nations Industrial Development Organization
UNOSSC	United Nations Office for South-South Cooperation
UNSTATS	United Nations Statistics Division
USD	United States Dollar
UK	United Kingdom
WB	World Bank
WEF	World Economic Forum
WFN	Water Footprint Network
WHO	World Health Organization
WSM	Weighted Sum Method
WGYD	Women, Gender, and Youth Directorate

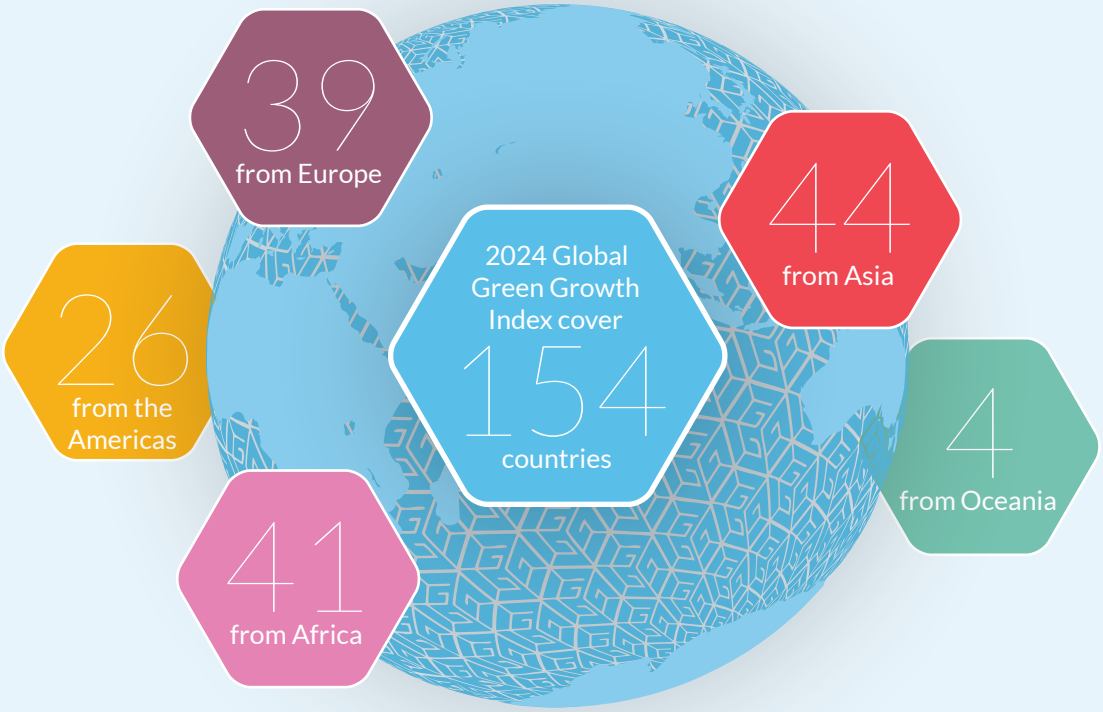
Executive Summary

1 About the 2024 Green Growth Index

The Green Growth Index is a policy tool measuring countries' progress in four sustainability dimensions: resource efficiency, natural capital protection, green economic opportunities, and social inclusion. The 2024 Green Growth Index presents scores from 2010 to 2023 and compares growth performance in 154 countries globally, including 41 in Africa, 26 in the Americas, 44 in Asia, 39 in Europe, and 4 in Oceania (Figure C1). In addition to the annual global report, the GGGI applies the Green Growth Index at regional and national levels. This year, GGGI publishes the regional Green Growth Index for selected African Least Developing Countries, including Burkina Faso, Ethiopia, Mozambique, Rwanda, Senegal, Togo, Uganda, and Zambia. In this report, the Lao PDR Green Growth Index is featured, and its report was published this year.

The Green Growth Index framework is built on GGGI's definition of green growth, emphasizing environmentally sustainable and socially inclusive economic development. GGGI, in collaboration with international experts, continuously refines the Green Growth Index indicator framework to ensure accuracy and relevance through annual reviews of Sustainable Development Goals (SDG) databases. Significant progress has been made since 2019 by replacing six proxy variables with SDG indicators. This year, "universal access to sustainable transport" was replaced with an SDG indicator, namely "proportion of the population with convenient access to public transport," further enhancing alignment with SDG targets. About 71 percent of the 48 green growth indicators in the Green Growth Index represent the SDGs. The natural capital protection dimension has the most SDG-based indicators, and green economic opportunities have the fewest. Benchmarking follows global standards, using SDG targets for SDG indicators; scientific benchmarks and top-performing countries' averages for non-SDG indicators. This approach ensures policy relevance and effective cross-country comparisons.

Figure C1. Global and regional coverage of the 2024 Green Growth Index



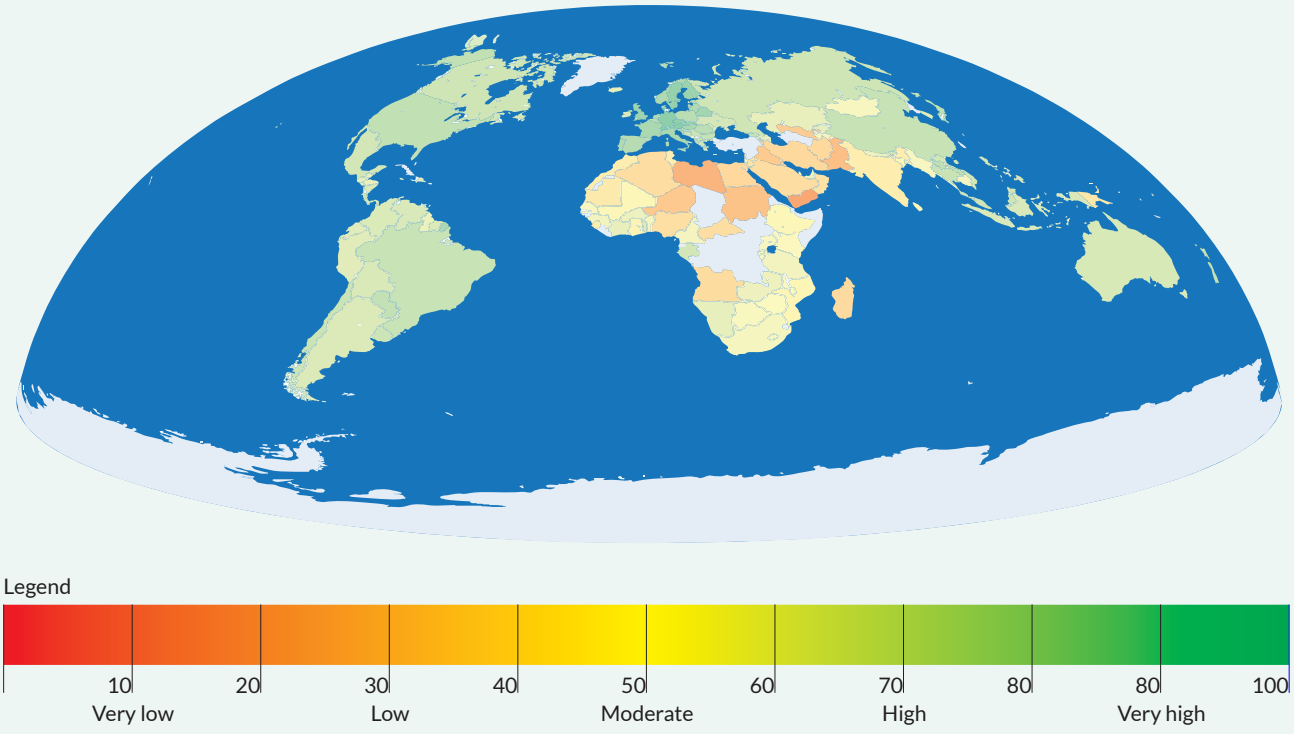
The Green Growth Index measures a country's performance in achieving sustainability targets, including Sustainable Development Goals (SDGs), the Paris Climate Agreement, and Aichi Biodiversity Targets. The Green Growth Index scores range from 1 to 100, classifying 1-20 as very low, 21-40 as low, 41-60 as moderate, 61-80 as high, and 81-100 as very high green growth performance. The highest score of 100 indicates that sustainability targets were achieved because the green growth indicators were benchmarked against these targets.

2 Global Overview

The Green Growth Index reveals a moderate global performance, with no country scoring extremely low or high. About 32 percent of the 154 ranked countries scored between 60 and 80, indicating high performance. These countries, mainly in Europe, cover 84 million km² and are home to three billion people. Moderate performers, scoring between 40 and 60, are represented by 96 countries, covering 50 million km² with a population of four billion. Eight countries, mainly in Asia, scored between 20 and 40, representing seven million km² and 3.8 billion people. Switzerland achieved the highest score (77.14), while Yemen ranked lowest (31.08), highlighting a gap from the sustainability target of 100. From 2010 to 2023, most countries improved their Green Growth Index scores. Moderate gains (0-10 percent) were observed in 104 countries, covering 93 million km² and 6.1 billion people. Nine countries experienced substantial increases (10-20 percent), while Iceland led with over a 20 percent improvement, driven by investments in renewable energy, electric vehicle adoption, and supportive policies.

The number of countries assessed differs by dimension: 188 in efficient and sustainable resource use, 195 in natural capital protection, 154 in green economic opportunities, and 182 in social inclusion. Global performance varies across different dimensions. In the efficient and sustainable resource use dimension, scores range from moderate to high, indicating highly variable performance across countries. Natural capital protection has a concentration of high scores, reflecting more vigorous global efforts in this area. However, green economic opportunities show significant disparities, with several countries scoring low, highlighting challenges in the green growth transition. Social inclusion performs well, with many countries achieving very high scores.

Figure C2. Global overview of the Green Growth Index performance, 2023

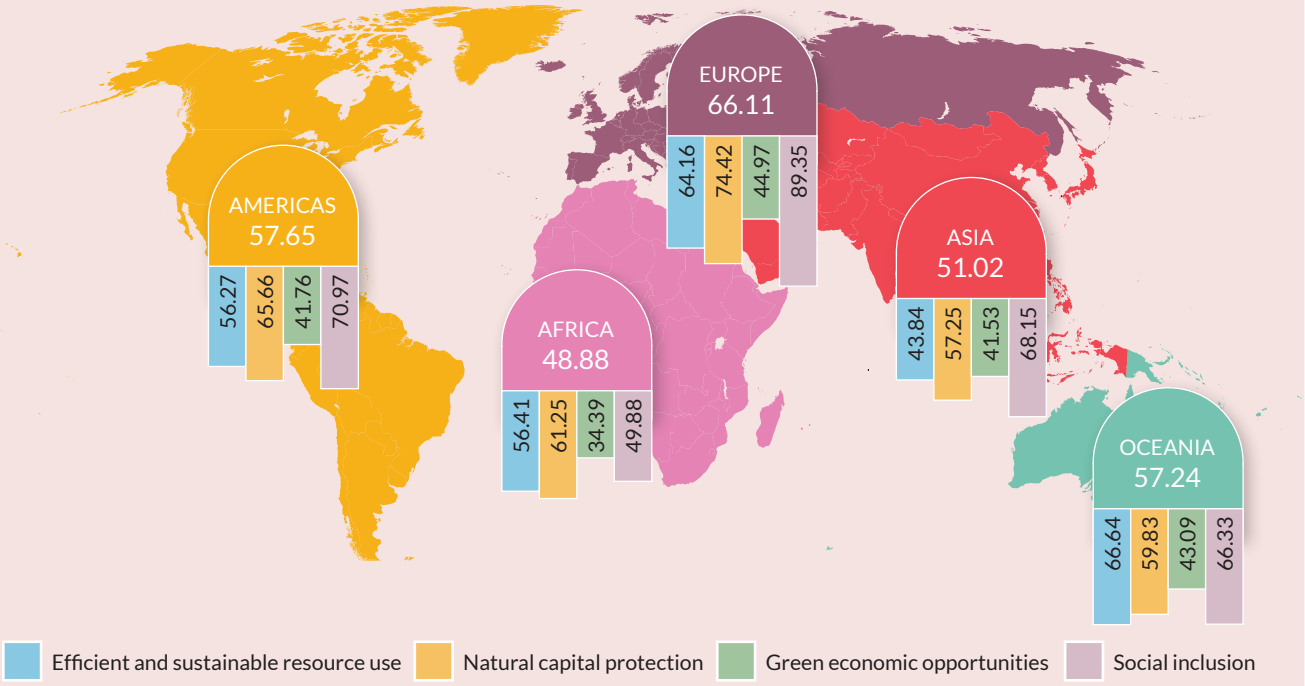


3 Regional Outlook

The Green Growth Index scores diverge substantially across regions, with Europe achieving the highest overall score of 66.11 (Figure C3). The Americas and Oceania are the second best-performing regions, scoring about 57. While Asia scores moderately at 51.02, Africa has the lowest regional Index score of 48.88, facing the most challenges in achieving sustainable targets. When comparing performance across dimensions, Europe consistently leads, scoring highest in natural capital protection (74.42) and social inclusion (89.35) while also performing high in efficient and sustainable resource use and moderate in green economic opportunities. Oceania follows efficient and sustainable resource use closely, scoring high at 66.64. However, compared with Europe, it lags in natural capital protection (59.83) and green economic opportunities (43.09). The Americas demonstrate a balanced performance, scoring high in social inclusion (70.97) and natural capital protection (65.66). However, the region lags in green economic opportunities, with scores lower than those in Europe and the Americas at 41.76. Asia shows strengths in social inclusion (68.15) but scores only moderately in efficient and sustainable resource use and green economic opportunities. With the lowest score in green economic opportunities and modest scores in other dimensions, particularly social inclusion, Africa achieved the slowest progress in the green growth transition.

The Green Growth Index trends from 2010 to 2023 also show variations across regions, with some progressing and others facing persistent challenges. Europe leads with scores improving from 63.51 in 2010 to 66.11 in 2023, driven by strong governance, ambitious policies like the European Green Deal, and investments in climate neutrality and biodiversity. The Americas and Oceania followed with moderate performances. The Americas rose slightly from 56.97 to 57.65, supported by renewable energy and conservation efforts. Oceania increased marginally from 56.21 to 57.24, with Australia and New Zealand leading despite challenges for smaller island nations. Asia's green growth scores improved slowly from 49.45 to 51.02 because regional resource management and socio-economic disparities offset its renewable energy progress. Africa remains the lowest-performing region, rising modestly from 47.5 to 48.88 due to infrastructure gaps, limited renewable investments, and political instability. These trends highlight Europe's leadership, the moderate stability of the Americas and Oceania, and the need for targeted strategies to address barriers in Asia and Africa for accelerated green growth

Figure C3. Green growth performance across dimensions by region, 2023

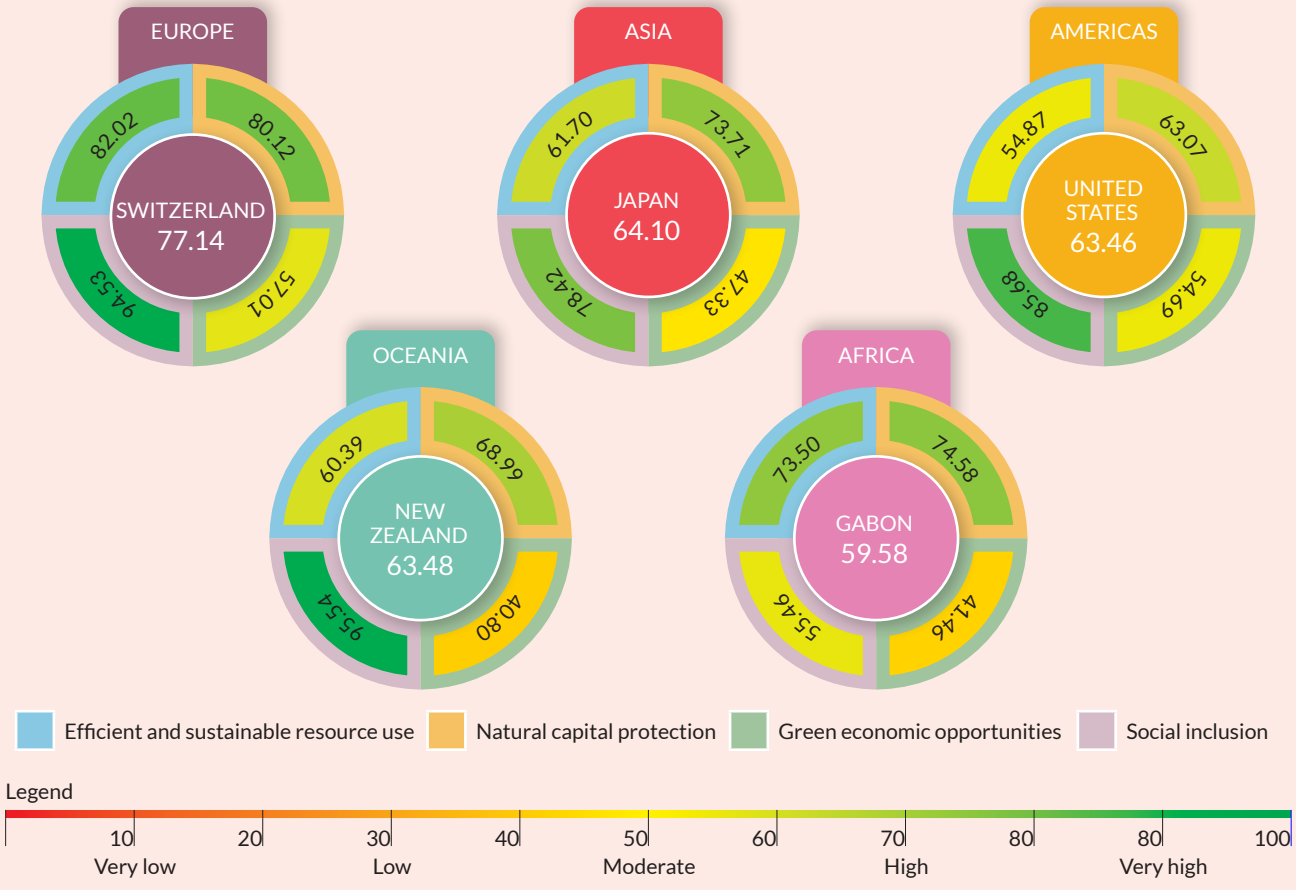


4 Best country performers

In the 2024 Green Growth Index, the top-performing countries by region were Switzerland (77.14) in Europe, Japan (64.10) in Asia, the United States (63.46) in the Americas, New Zealand (63.48) in Oceania, and Gabon (59.58) in Africa (Figure C4). Switzerland led globally, excelling in environmental governance, sustainable resource management, and advanced water efficiency. Japan performed well in social inclusion and environmental quality but faced challenges in gender equality and renewable energy adoption. The United States showed strengths in social inclusion but encountered obstacles in renewable energy employment and sustainable fisheries due to fragmented regulations and reliance on capital-intensive technologies. New Zealand excelled in social inclusion and cultural conservation but faced overfishing, unsustainable fisheries practices, and challenges in scaling its organic agriculture sector. Gabon was Africa's leader, recognized for sustainable resource use and natural capital protection, though it lagged in fostering green economic opportunities and industrial innovation.

Performance in dimensions diverged across the top-performing countries. Switzerland, the top performer globally, showed exceptional performance across all dimensions, with the highest scores in efficient and sustainable resource use at 82.02 and social inclusion at 94.53. Gabon leads Africa with strong scores in natural capital protection, a score of 74.58, and efficient and sustainable resource use, a score of 73.50. However, it lags in green economic opportunities and social inclusion, signaling areas for improvement in economic innovation and equity. In Asia, Japan scored highly in natural capital protection at 73.71 and social inclusion at 78.42, driven by environmental quality and inclusive policies. Challenges remained in improving performance in green economic opportunities in Japan. The United States excelled in social inclusion with a score of 85.68. Still, it showed a mixed performance in efficient and sustainable resource use and natural capital protection, with regulatory barriers impacting green economic opportunities. New Zealand, Oceania's top performer, ranks highest in social inclusion at 95.54, highlighting social equity and cultural conservation strengths. However, its low green economic opportunities score, only 40.80, reflects challenges in sustainable fisheries and organic agriculture.

Figure C4. Best-performing countries by region and across dimensions, 2023

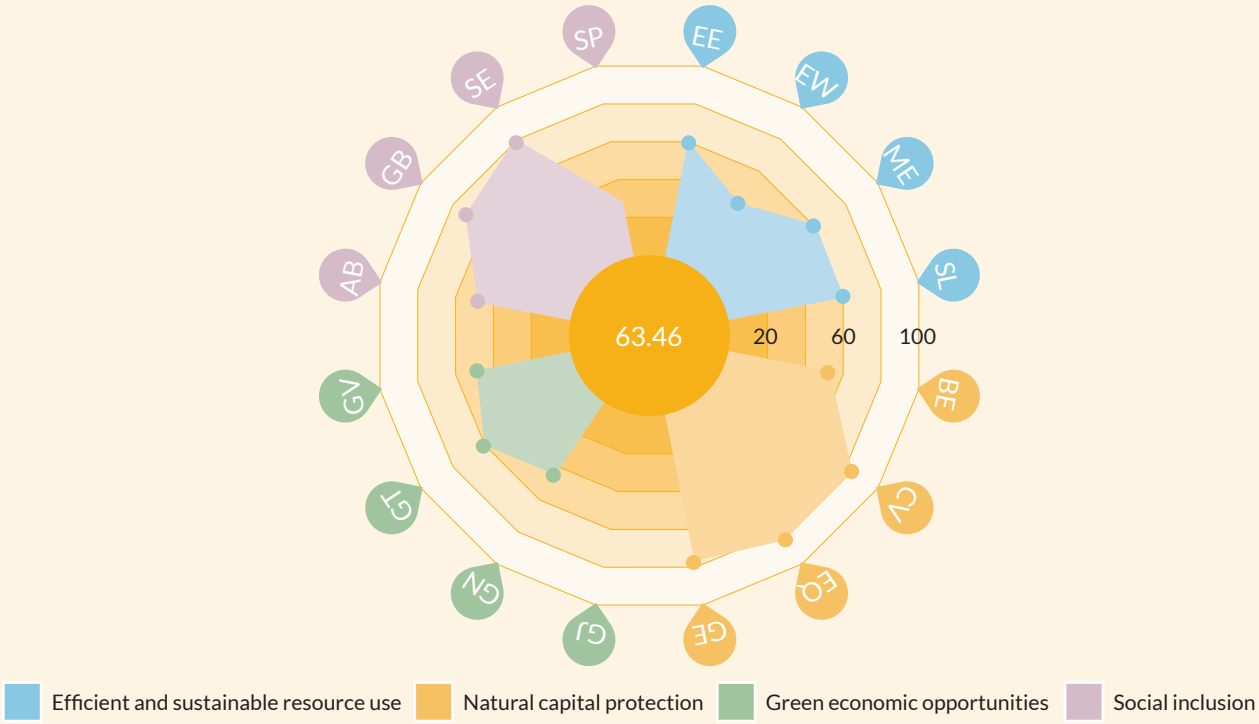


5 Featured Country: Lao PDR

The 2024 Green Growth Index features Lao PDR's National Green Growth Index. The development of the Lao PDR Green Growth Index was a collaborative initiative led by the Global Green Growth Institute (GGGI) and the Ministry of Planning and Investment (MPI), launched on July 1, 2022. The project engaged 159 national experts from 20 institutions, including government agencies, NGOs, academia, and the private sector, through participatory activities such as webinars, surveys, workshops, and consultations. This inclusive process resulted in selecting 80 policy-relevant indicators across four dimensions of green growth—efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion—tailored to Lao PDR's national context and priorities. Key contributors included the Ministry of Agriculture and Forestry (MAF), with 25 participants, and the MPI's Development Research Institute (DRI), which actively participated in five activities. Contributions from other ministries, such as Energy and Mines and Natural Resources and Environment, further enriched the Index. The participatory process facilitated the experts' capacity building, enhancing their expertise in green growth methodologies. Moreover, the collaborative and context-specific approach ensures the development of an analytically robust and policy-relevant Green Growth Index for guiding Lao PDR's green growth transition.

Figure C5 highlights Lao PDR's progress toward green growth targets, using circular diagrams to illustrate proximity to goals—longer bars indicate closer achievement, while shorter bars highlight areas for improvement. The comparison between Lao PDR's national Green Growth Index (80 indicators) and the global Green Growth Index (40 indicators) reveals an overall close alignment, with scores of 68.24 and 63.36, respectively, but significant variations in pillar-level performance. These differences are attributed to the context-specific approach to the national Index, prioritizing indicators relevant to Lao PDR and benchmarking against ASEAN leaders, compared to the Global Green Growth Index using global targets. Lao PDR excels in efficient and sustainable water use (EW) and GHG emissions reduction (GE), achieving national scores of 85.55 and 85.5, higher than its global scores of 50.78 and 78.95. Similarly, progress in gender balance (GB) is evident, with a national score of 84.3 compared to the global score of 76.5. However, challenges persist in areas like cultural and social value (CV), where the national score of 45.08 falls far below the global score of 86.36, reflecting gaps in eco-tourism and conservation financing. While Lao PDR performs moderately in social protection (SP) with a national score of 66.32, exceeding the global score of 36.75, disaster preparedness and social security programs require further improvement. Additional challenges include green innovation (GN) and green trade (GT), with national scores of 55.78 and 58.68, constrained by limited environmental exports and high-tech industries. Addressing these gaps through targeted investments in eco-tourism, green manufacturing, and technological innovation will be critical for enhancing Lao PDR's green growth trajectory.

Figure C5. Lao PDR's distances to sustainability targets and green growth performance, 2023

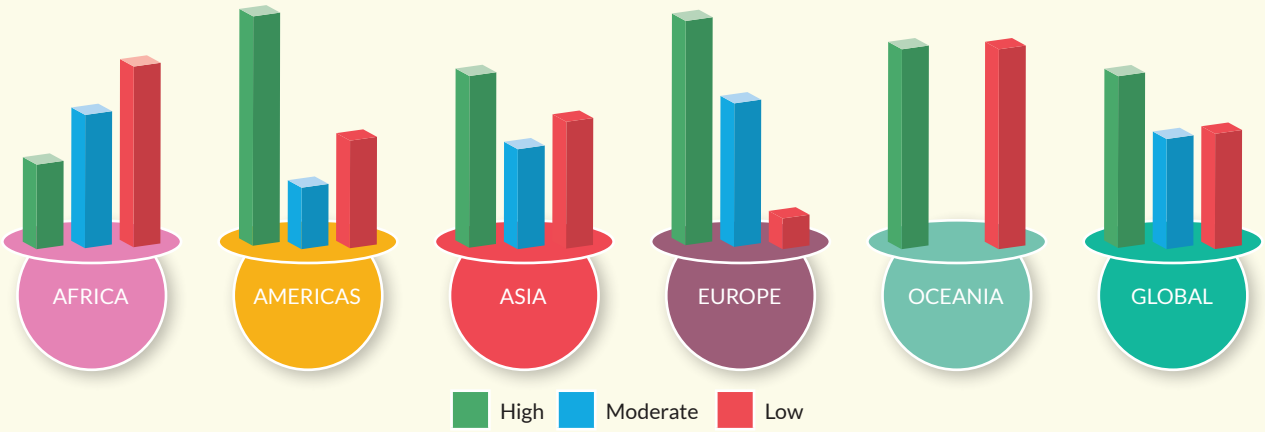


6 Next steps forward

Significant progress was made in improving the indicator quality of the Green Growth Index, including replacing proxy variables with more robust metrics as data availability improves. However, as in past reports, the 2024 Green Growth Index highlights data availability as a critical factor influencing the comparability and interpretability of green growth performance across regions and countries. Most data were sourced from international organizations for consistency, but gaps persist, requiring imputation for indicators like municipal solid waste (EQ3) and sustainable transport efficiency (EE3). Due to data limitations, the 2024 Green Growth Index includes only 154 countries, allowing up to 25 percent of missing data for aggregation. Confidence levels of the Green Growth Index scores are provided for each country's overall index and dimensions, providing the level of uncertainty in interpretation and flagging the critical data gaps to be addressed. Globally, 43.23 percent of countries exhibit high confidence, while moderate and low confidence levels account for 27.74 and 29.03 percent, respectively (Figure C6). Regionally, Europe and the Americas demonstrate strong data availability, with 56.41 and 57.69 percent of countries achieving high confidence, respectively, and minimal low-confidence levels in Europe (7.69 percent). Asia shows a balanced distribution, with 43.18 percent high, 25 percent moderate, and 31.82 percent low confidence, reflecting uneven data coverage. In contrast, Africa and Oceania face more substantial challenges; Africa has the highest share of low-confidence countries (45.24 percent), while Oceania shows an even split between high and low confidence (50 percent each). The confidence level disparities across regions emphasize the need to improve data collection and reporting, particularly in Africa, Oceania, and parts of Asia, to make the Green Growth Index a more effective tool for tracking performance in global green growth transitions.

Among the four green growth dimensions, natural capital protection shows the highest global confidence, with about 70 percent of countries having substantial data availability, particularly in the Americas (nearly 90 percent). Social inclusion indicators also exhibit high confidence in the Americas and Europe, where over 90 percent of countries are well-represented. However, confidence levels are moderate in Africa and low in Oceania. In contrast, green economic opportunities face the most critical data gaps, with only about 45 percent of countries in the Americas showing high confidence, while Europe and Oceania have low confidence levels in nearly all countries. For efficient and sustainable resource use, Europe and the Americas lead with over 50 percent of countries rated with high-confidence, while Oceania has moderate levels, and Africa records the highest share of low-confidence countries (over 30 percent). The confidence levels provided critical information for improving data gaps, especially in green economic opportunities, to enhance the comparability of dimension scores. GGGI conducts annual data availability assessments, focusing on SDG indicators, to address these issues and improve the Green Growth Index.

Figure C6. Distribution of confidence levels of the Green Growth Index scores based on data availability, 2010-2023

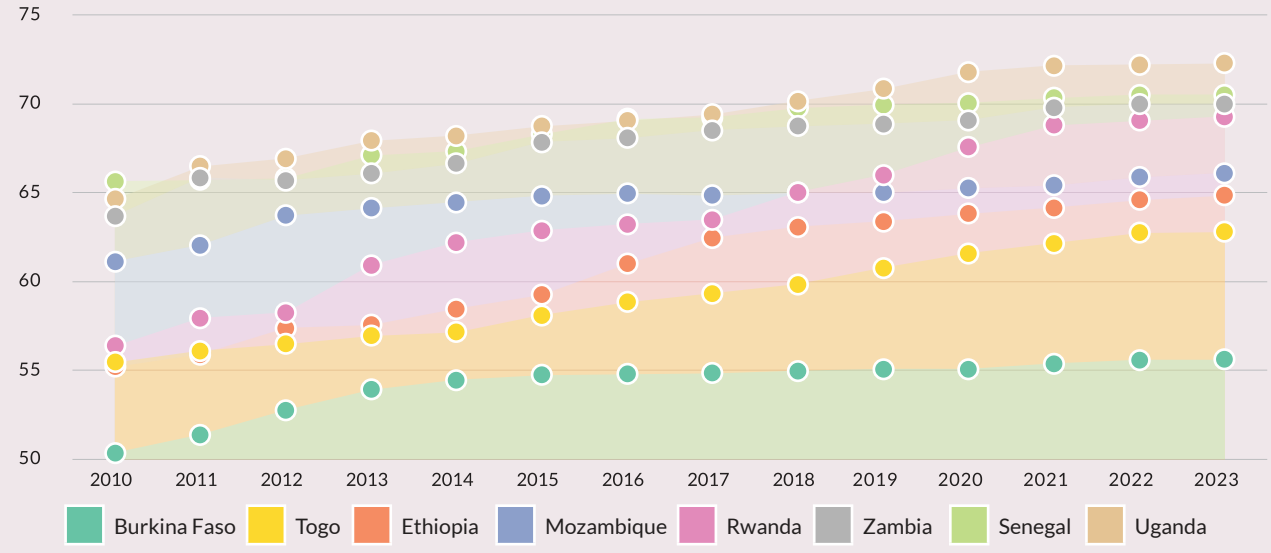


7 Green Growth Index projects

The 2024 Green Growth Index projects demonstrate significant progress in rolling out applications at the regional and national levels to assess SDG alignment of green growth performance and advancing methodologies to link with the Green Growth Simulation Tool (GGSim) to assess SDG co-benefits of climate actions. This year, six projects were completed, including one regional, four national, and one AI-related. The Africa LDC Green Growth Index assesses the green growth performance of eight Least Developed Countries (LDCs), revealing gradual improvements from 2010 to 2023, with Senegal, Uganda, and Rwanda leading and Burkina Faso and Togo facing challenges (Figure C7). The Lao PDR Green Growth Index, featured in this report, is aligned with the National Green Growth Strategy to monitor green investments, mainstream green growth into policies, and evaluate progress toward enhancing green growth transition. Moreover, the GGSim application in Lao PDR explores climate adaptation measures and their socio-economic impacts, highlighting policy-driven improvements in SDG indicators in the AFOLU and water sectors. The GGSim application for Strategic Outcomes is a new initiative to evaluate the effects of climate policies, testing the applicability of the GGSim Models to assess policy impacts of GGGI's country projects. The UAE Air Quality and Health Impact Assessment developed an official guideline for the government to measure and track the health impacts of air pollution, strengthening evidence-based policymaking. Lastly, the Data and AI for Green Growth Phase I project explored AI applications in green growth domains, presenting innovative solutions like AI-supported tools for climate action and green growth.

Moreover, several ongoing projects in 2024-2025 further reflect GGGI's commitment to advancing green growth through innovative, participatory, and data-driven approaches. The African Green and Inclusive Gender Index, developed in collaboration with the African Union and other partners, aims to support policymakers in measuring and accelerating gender and social inclusion in green growth, with regional consultations ensuring regional-specific relevance. Similarly, the AI Pilot Project – Gender Inclusiveness in Africa integrates AI-based models into GGGI's GGSim to assess gender inclusiveness, leveraging advanced analytics for targeted interventions. The Togo National Green Growth Index engages 49 experts from 32 institutions to align indicators with national priorities, fostering ownership and capacity building for policy planning. The Data and AI for Green Growth Phase II focuses on identifying AI applications for climate action and resource mobilization, with efforts to position GGGI as a leader in AI-driven sustainability solutions. In Jordan, the Sectoral Green Growth National Action Plans (GG-NAP) review and update existing action plans across six sectors, providing insights into green growth transition effectiveness and developing a new Green Growth Index to guide future strategies. These projects showcase GGGI's strategic emphasis on participatory and data-driven approaches and align them with national and regional green growth priorities.

Figure C7. Green Growth Index scores for the Africa LDCs, 2010-2023




GGGI
Global Green Growth Week
Global Green Growth Week 2024
Green Growth in Times of Uncertainty
Oct. 14 ~ 18, 2024 | Seoul, Republic of Korea & Oct. 22, 2024 | Cali, Republic of Colombia
Malle Fofana
Lilibeth Acosta
Helena McLeod
Kyung Nam Shin
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Global Green Growth Week
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Global Green Growth Week 2024
Green Growth in Times of Uncertainty

1 Introduction

1.1 About the Green Growth Index

The Global Green Growth Index (GGGI) is a comprehensive tool designed to measure and track countries' progress toward sustainable development through a green model of growth. It evaluates performance across four key dimensions of green growth: efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. By providing a standardized framework, the Green Growth Index serves as a benchmark for policymakers and stakeholders, helping to guide strategies toward greener and more inclusive economic pathways. Since its first publication in 2019, the Index has aimed to foster informed decision-making that integrates economic development with environmental sustainability and social well-being. Its insights are particularly crucial in addressing the challenges and opportunities presented by rapidly changing climate conditions, economic dynamics, and technological advancements. The 2024 edition marks the sixth consecutive year of its publication, underscoring its critical contribution to advancing global green growth objectives.

The 2024 Global Green Growth Index incorporates updated data for 154 countries (41 in Africa, 26 in the Americas, 44 in Asia, 39 in Europe, and 4 in Oceania), delivering a detailed evaluation of their sustainability performance and highlighting trends in green growth worldwide. This year's assessment offers a nuanced perspective on how countries navigate the complexities of sustainable development, with the Index serving as a vital tool for benchmarking progress and identifying areas for improvement. Key findings, accessible through this interactive dashboard, reveal that nearly half of the countries achieved moderate scores. These results indicate meaningful advancements in some areas while pointing to persistent gaps that demand further action. A significant enhancement in this year's report is the inclusion of the "Global Influence of the Index" section, which demonstrates how the Index has been widely utilized and recognized by the international community and scientific institutions. This addition showcases its growing role as an essential resource for evaluating green growth transitions and shaping informed sustainability policies on a global scale.

The GGGI applies the Green Growth Index at three distinct levels: global, regional, and national, each serving unique purposes. At the global level, as showcased in this report, the Index provides a holistic perspective on international trends, enabling cross-country comparisons and the identification of global priorities. Regionally, the Index supports targeted analyses to address specific sustainability challenges within geographic contexts. For example, it evaluates the synergy between green and blue economies in the OECS Green-Blue Growth Index, explores green growth transition challenges in the Azerbaijan and Central Asian Green Growth Index, emphasizes inclusive growth priorities in the Africa Least Developed Countries (LDCs) Green Growth Index, and highlights gender inclusiveness in the Green and Gender Inclusive Index for African Regional Economic Communities (RECs). At the national level, the Index supports governments in designing and evaluating green growth policies aligned with local contexts and national development plans. GGGI has actively supported governments in Zambia, Kenya, Ghana, Togo, and Lao PDR in developing their National Green Growth Index through participatory approaches involving at least 30 ministries and line agencies. These multi-level applications demonstrate the versatility and impact of the Green Growth Index in driving sustainable transformation globally.

1.1.1 Conceptual framework

The Green Growth Index framework is anchored in the GGGI's holistic definition of green growth: "*Green growth is a development approach that seeks to deliver economic growth that is both environmentally sustainable and socially inclusive. It seeks opportunities for economic growth that are low-carbon and climate resilient, prevent or remediate pollution, maintain healthy and productive ecosystems, and create green jobs, reduce poverty and enhance social inclusion.*"[1] GGGI's definition emphasizes a dual focus on environmental sustainability and socio-economic equity, highlighting the interdependence of ecological health and human well-being. By integrating environmental considerations with economic and social dimensions, green growth surpasses traditional development models, which often prioritize short-term economic gains at the expense of natural resources and social fairness. Instead, it offers a transformative approach, aiming to balance these critical aspects for long-term prosperity. The Green Growth Index framework further recognizes that economic growth must not only address environmental degradation and climate impacts but also foster opportunities accessible to all segments of society, particularly the most vulnerable. It emphasizes the importance of innovation, green investments, and systemic changes to drive inclusive and sustainable development. By ensuring that no one is left behind, green growth becomes not merely an aspiration but a practical roadmap for achieving Sustainable Development Goals (SDGs) and tackling global challenges such as climate change, biodiversity loss, and inequality.

The Green Growth Index framework is multi-dimensional, reflecting GGGI's comprehensive definition of green growth by capturing the interconnected and complex nature of sustainability challenges and opportunities. This multi-dimensionality is crucial because sustainable development cannot be achieved by focusing on single issues in isolation; instead, it requires a holistic approach that integrates economic, environmental, and social priorities. By incorporating diverse aspects such as resource efficiency, ecosystem health, inclusivity, and resilience, the Green Growth Index provides a more thorough and actionable assessment of a country's progress toward green growth. The framework integrates four interlinked green growth dimensions, which are grounded in the sustainability

concepts of a low-carbon economy, ecosystem health, inclusive growth, and a resilient society (Figure 1). Efficient and sustainable resource use supports natural capital protection while advancing a low-carbon economy. Resources such as water, energy, land, and materials are pivotal for climate mitigation, while safeguarding natural capital ensures a healthy ecosystem that enhances economic productivity and fosters opportunities such as green jobs, trade, investment, and innovation. Social inclusion plays a central role in enabling all members of society to contribute to and benefit from these opportunities, thus ensuring inclusive growth and strengthening societal resilience. Green growth also prioritizes equitable access to resources and services, gender equality, and social protection, all of which are critical for climate adaptation.

Each dimension is represented by four sustainability pillars, or indicator categories, which form the foundation of the Green Growth Index. These pillars guide the transition toward sustainable resource use, enhanced natural capital protection, green economic opportunities, and social inclusion. Box 1 outlines these pillars, while Section 1.1.2 provides a detailed discussion of the green growth indicators underpinning them. The indicators are benchmarked against global sustainability targets (see Section 6.3 and Annex 1), where a score of 100 indicates that a country has fully achieved the target. Scores are categorized as follows:

- **81–100:** Very high, indicating the target is achieved or nearly achieved.
- **61–80:** High, reflecting significant progress with strategic alignment toward the target.
- **41–60:** Moderate, showing a balanced approach to progress while avoiding setbacks.
- **21–40:** Low, signaling the need for policies to better align development with the target.
- **1–20:** Very low, requiring substantial actions to improve performance relative to the target.

This scoring system provides an actionable framework for countries to assess their green growth performance and identify pathways for improvement.

1.1.2 Indicator framework

GGGI, in collaboration with international experts, has continuously refined the indicator framework for the Green Growth Index to enhance its accuracy and relevance. This iterative process involves an annual review of SDG databases to evaluate whether data availability for SDG indicators relevant to green growth has improved. Regular updates to the framework ensure that the Green Growth Index reflects the most current and reliable data while keeping up with the latest developments in sustainability measurements and indicators.

Figure 1. Conceptual Framework for the Green Growth Index

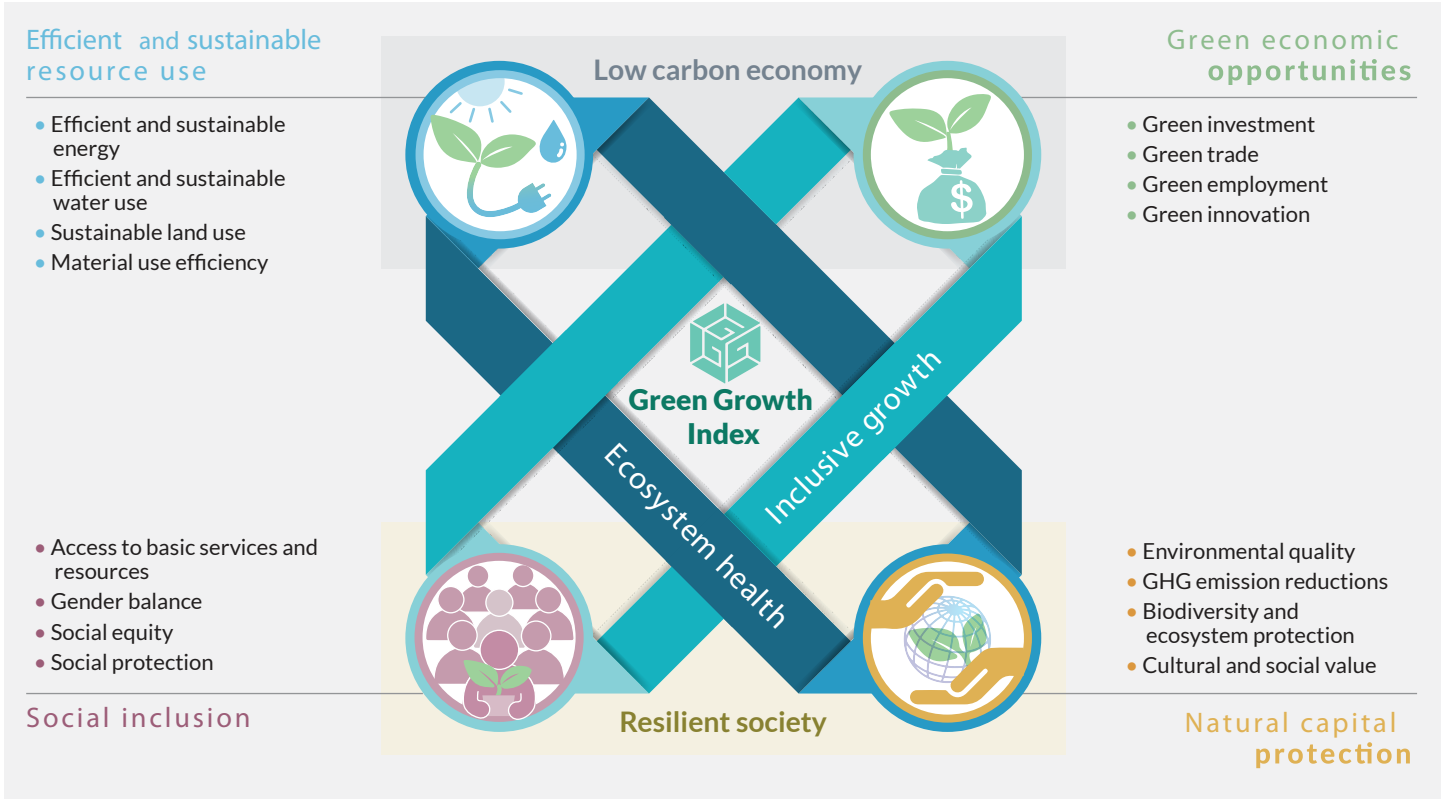


Figure 2. Indicator Framework for the 2023 Green Growth Index

Dimensions [Goals]	Indicator categories [Pillars]	Indicators [metrics]	
Green Growth Index			
Efficient and sustainable resource use 	Efficient and sustainable energy	EE1	Ratio of total primary energy supply to GDP (MJ per $2011 PPP GDP)
		EE2	Share of renewable to total final energy consumption (Percent)
		EE3	Logistics performance, efficiency in sustainable transport (Score)
	Efficient and sustainable water use	EW1	Water use efficiency (USD per m^3)
		EW2	Share of freshwater withdrawal to available freshwater resources (Percent)
		EW3	Sustainable fisheries as a proportion of GDP (Ratio)
	Sustainable land use	SL1	Nutrient balance per unit area (Tons per hectare)
		SL2	Share agriculture organic to total agriculture land area (Percent)
		SL3	Livestock units per agricultural land area (LSU/ha)
	Material use efficiency	ME1	Domestic material consumption per unit of GDP (Kilograms per constant 2015 USD)
		ME2	Total material footprint (MF) per capita (Tons per capita)
		ME3	Average of food loss to production and food waste to consumption (Percent)
Natural capital protection 	Environmental quality	EQ1	$PM_{2.5}$ air pollution, mean annual population-weighted exposure (Micrograms per m^3)
		EQ2	DALY rate due to unsafe water sources (DALY lost per 100,000 persons)
		EQ3	Municipal solid waste (MSW) generation per capita (Tons per year per capita)
	Greenhouse gas emissions reductions	GE1	Ratio of CO_2 emissions to population, including AFOLU (Metric tons per capita)
		GE2	Ratio of non-CO_2 (CH_4, N_2O and F-gas) emissions to population, excluding AFOLU (CO_2eq tons per capita)
		GE3	Ratio of non-CO_2 (CH_4, N_2O and F-gas) emissions in agriculture to population (CO_2eq tons per capita)
	Biodiversity and ecosystem protection	BE1	Average proportion of Key Biodiversity Areas covered by protected areas (Percent)
		BE2	Share of forest area to total land area (Percent)
		BE3	Above-ground biomass in forest (Tons per hectare)
	Cultural and social value	CV1	Red List Index (Score)
		CV2	Tourism and recreation in coastal and marine areas (Score)
		CV3	Share of terrestrial and marine protected areas to total territorial areas (Percent)
Green economic opportunities 	Green investment	GV1	Ratio of adjusted net savings to GNI, including particulate emission damage (5 yrs moving ave.)
		GV2	Degree of integrated water resources management implementation, financing (Percent)
		GV3	Total amount of funding to promote environmentally sound technologies per GDP (Ratio)
	Green trade	GT1	Share of export of environmental goods to total export (Percent)
		GT2	CO_2 emissions embedded in trade (Percent)
		GT3	Water virtual trade flows (Tons per hectare)
	Green employment	GJ1	Share of green manufacturing employment in total manufacturing employment (Percent)
		GJ2	Ratio of renewable energy employment to renewable energy production (Ratio)
		GJ3	Employed population below international poverty line (Percent)
	Green innovation	GN1	Development of environment-related technologies, share of patents (Percent)
		GN2	University-industry collaboration in Research & Development (Score)
		GN3	Installed renewable energy-generating capacity (Watts per capita)
Social inclusion 	Access to basic services and resources	AB1	Population with access to basic services, i.e. Water, sanitation, electricity, and clean fuels (Percent)
		AB2	Prevalence of undernourishment (Percent)
		AB3	Proportion of population with convenient access to public transport (Percent)
	Gender balance	GB1	Proportion of seats held by women in national parliaments (Percent)
		GB2	Gender ratio of an account at a financial institution or mobile-money-service provider (Ratio)
		GB3	Getting paid, covering laws and regulations for equal gender pay (Score)
	Social equity	SE1	Inequality in income based on Palma ratio (Ratio)
		SE2	Population with access to basic services by urban/rural, i.e. electricity (Ratio)
		SE3	Share of youth (aged 15-24 years) not in education, employment or training (Percent)
	Social protection	SP1	Proportion of population above statutory pensionable age receiving pension (Percent)
		SP2	Universal health coverage (UHC) service coverage (Score)
		SP3	Proportion of urban population living in slums (Percent)

Box 1. Definitions of the green growth pillars in Figure 1

1. Efficient and sustainable energy refers to delivering more services or products per unit of energy used and meeting present needs by using renewable sources to ensure sustainability of energy for future use (IRENA & C2E2, 2015; Kutscher, Milford, & Keith, 2018).
2. Efficient and sustainable water use refers to delivering more services or products per unit of water used, reducing environmental impact resulting from water scarcity and pollution, and improving water allocation among competing uses (UNEP, 2014; Wang, Yang, Deng, & Lan, 2015).
3. Sustainable land use refers to delivering more services or products for a fixed amount of land used and without compromising many ecosystem services provided by land (Auzins, Geipele, & Geipele, 2014; Smith, 2018).
4. Material use efficiency refers to delivering more services or products per unit of raw material used and reducing material demand through increased recycling, longer-lasting products, and component re-use, among others (Allwood, Ashby, Gutowski, & Worrell, 2011; Lifset & Eckelman, 2013).
5. Environmental quality refers to properties and characteristics of the environment which may affect the health of human beings and other organisms, including air, water and noise pollution, access to open space, and visual impacts of buildings (EEA, 2015, 2017).
6. Greenhouse gas (GHG) emission reduction refers to the reduction and removal of CO_2 and non-CO_2 emissions from the atmosphere in order to address climate change (IPCC, 2013; Symon, 2013).
7. Biodiversity and ecosystem protection refers to the protection of species, habitats, and ecosystems as well as the services they provide, with protected areas as an important measure to achieve biodiversity conservation (UNEP-WCMC & IUCN, 2016; IPBES, 2018).
8. Cultural and social value refers to the societal value given to natural capital due to its importance to communities and their local culture, which encourages sustainable use and protection of natural resources (Small, Munday, & Durance, 2017; da Rocha, Almassy, & Pinter, 2017).
9. Green investment refers to public and private investment that promotes, in a direct or indirect manner, sustainable resource use, including material, water, energy, and land, and natural capital protection, such as environmental protection and climate action, advancing sustainable development and green growth (Eyraud, Wane, Zhang, & Clements, 2011; Lović Obradović, 2019).
10. Green trade refers to the competitiveness of a country to produce and export environmental goods that can contribute to environmental protection, climate action, green growth, and sustainable development (PAGE, 2017a; European Parliament, 2019).
11. Green jobs refer to employment created and sustained by economic activities that are more environmentally sustainable; contribute to protecting the environment and reduce people's environmental footprint; and offer decent working conditions (UNEP, ILO, IOE, & ITUC, 2008; ILO, 2015).
12. Green innovation refers to product, process, and service innovations such as energy-saving, pollution-prevention, waste recycling, green product designs, or corporate environmental management that yields environmental benefits (Schiederig, Tietze, & Herstatt, 2011; Gao et al., 2018).
13. Access to basic services refers to the general availability of services, such as telecommunications, financial, water and sanitation, and energy services, to people regardless of income and location, and which requires an effective governance at multiple scales due to the local nature of these services (OECD & WB, 2006; UCLG, 2014).
14. Gender balance refers to equality based on gender in terms of rights, resources, opportunities, and protection, and the ability to use them to make strategic choices and decision. Women's social and economic empowerment at work, home, and communities increases inclusive growth and reduces poverty (UNICEF, 2011; UN Women, 2018).
15. Social equity refers to a fair and equitable public and social policy, giving equal opportunities to all by a fair allocation of and access to resources that take into account social inequalities. Addressing and embedding equity issues in the design of a policy will lead to sustainable economic growth over the long term (Clench-Aas & Holte, 2018; OECD, 2018).
16. Social protection refers to programs designed to provide benefits to ensure income security and access to social services, contributing to social equity and inclusive society and reducing poverty and exposure to risks (UNRISD, 2010; ESCWA, 2015).

In last year's report, additional indicators were added to the green economic opportunities dimension, resulting in an equal distribution of indicators across all pillars and dimensions. However, many indicators still rely on proxy variables due to data limitations. Proxy variables are indirect measures or substitutes used when direct data for a specific indicator is unavailable or insufficient. Although they do not measure the intended concept directly, these proxies are carefully selected to approximate the desired data as closely as possible, maintaining the robustness and relevance of the Index despite gaps in data availability. The proxy variables in the 2024 Green Growth Index include:

- **Efficient and Sustainable Resource Use Dimension**: Efficiency in sustainable transport (EE3) and ruminant livestock per agricultural area (SL3).
- **Natural Capital Protection Dimension**: PM2.5 air pollution (EQ1), DALY rate due to unsafe water sources (EQ2), share of forest area to total land area (BE2), Red List Index (CV1), tourism and recreation in coastal and marine areas (CV2), and share of terrestrial and marine protected areas to total territorial areas (CV3).
- **Green Economic Opportunities Dimension**: Ratio of adjusted net savings to GNI (including particulate emission damage, GV1), employed population below the international poverty line (GJ3), and installed renewable electricity-generating capacity (GN3).
- **Social Inclusion Dimension**: Proportion of urban population living in slums (SP3).

Progress has been made in replacing proxy variables with more precise green growth indicators. Between 2019 and 2021, six proxy variables were replaced with direct indicators, primarily sourced from the UNSTATS database.[2] One proxy variable in the social inclusion dimension was replaced this year, i.e., universal access to sustainable transport (AB3), which source of data was the Sum4All. The new indicator is the proportion of the population with convenient access to public transport, which is an SDG indicator.

1.1.3 Link to the SDGs

Of the 48 indicators in the Green Growth Index, 34 (71 percent) are directly sourced from SDG indicators. However, three composite indicators—ME3 (food loss and food waste), BE1 (marine, freshwater, terrestrial, and mountain ecosystems), and AB1 (access to water, sanitation, electricity, and clean fuels)—combine multiple SDG indicators into single green growth indicators. As a result, the total number of SDG indicators represented in the Index increases to 41 (Figure 3.A). Among the green growth dimensions, the natural capital protection dimension includes the highest number of SDG indicators, while the green economic opportunities dimension includes the fewest. Notably, four of the eight new indicators added to the green economic opportunities dimension in recent years are SDGs, such as the degree of integrated water resources management implementation (GV2), funding for environmentally sound technologies (GV3), employed population below the international poverty line (GJ3), and installed renewable energy capacity (GN3). Moreover, GJ1 (share of green employment in total manufacturing) is linked to SDG 9.2.2 on manufacturing employment but emphasizes the "green" aspects of this indicator.

The remaining 29 percent of the Green Growth Index indicators are non-SDGs, but they still contribute to the achievement of the SDGs (Figure 3.B). Many non-SDG indicators may eventually be incorporated into SDG frameworks as UN Member Countries and international organizations continue to refine and expand SDG databases. For example, there are discussions around adopting the Palma Ratio, a measure of income inequality, as part of SDG 10.[3] Currently, SDG 10.4.2 uses the Gini Index to measure income inequality[4], but its limitations suggest a need for complementary indicators to fully address Goal 10's aim of reducing inequality. Similarly, transport-related SDG indicators have seen updates, such as the recent inclusion of SDG 11.2.1 on access to public transport[5], though data availability remains limited. SDG 9.1.2, which covers passenger and freight volumes by transport mode, relates to the efficiency in sustainable transport (EE3) indicator, which is currently a proxy and will be replaced as data availability improves in the coming years.

Including SDG indicators in the Green Growth Index provides significant policy relevance, offering well-established targets for benchmarking green growth indicators. However, certain SDG indicators lack globally agreed climate targets, such as GHG emissions reduction, where countries rely on their nationally determined contributions (NDCs). To enable cross-country comparisons, national targets are not used. Instead, sustainability targets for all green growth indicators are determined using the following criteria:

For SDG Indicators:

1. **Adopt SDG targets**, both explicit and implicit, as suggested by Organisation for Economic Co-operation and Development (OECD)[6] and UN Sustainable Development Solutions Network (SDSN)[7] reports. If interpretations of implicit targets vary, SDSN global values are prioritized.
2. **Top-performing countries**: Where no explicit targets exist, the average value of the top five performers globally is used as a benchmark.

For Non-SDG Indicators:

3. **Scientific and organizational benchmarks**: Targets suggested in scientific literature and international organization reports are adopted where available.
4. **Top-performing countries**: For indicators without available targets, the average value of the top five performers is applied.

These methods align with approaches used in other global indices, such as the Sustainable Development Solutions Network (SDSN) SDG Index[8] and Dashboard and the United Nations Environment Programme (UNEP) Green Economy Progress (GEP) Index[9]. Detailed explanations of the sustainability targets used in the 2024 Green Growth Index are presented in Section 6.3..

Figure 3. Links of the Green Growth Index to Sustainable Development Goals

A. Sustainable Development Goals (SDG) indicators used in the Green Growth Index

	Dimensions		Indicators [metrics]	Sustainable Development Goals (SDG)*		
				Goal	Target	Indicator
Green Growth Index	Efficient and sustainable resource use	EE1	Ratio of total primary energy supply to GDP	Affordable and clean energy	7.3	7.3.1
		EE2	Share of renewable to total final energy consumption	Affordable and clean energy	7.2	7.2.1
		EW1	Water use efficiency	Clean water and sanitation	6.4	6.4.1
		EW2	Share of freshwater withdrawal to available freshwater resources	Clean water and sanitation	6.4	6.4.2
		EW3	Sustainable fisheries as a proportion of GDP	Life below water	14.7	14.7.1
		ME1	Domestic material consumption per unit of GDP	Decent work and economic growth	8.4	8.4.2
				Responsible consumption and production	12.2	12.2.2
		ME2	Total material footprint per capita population	Decent work and economic growth	8.4	8.4.2
		ME3	Share of food loss to production and food waste to consumption	Responsible consumption and production	12.3.1	12.3.1(a) 12.3.1(b)
	Natural capital protection	EQ1	$PM_{2.5}$ air pollution, mean annual population-weighted exposure	Good health and well-being	3.9	3.9.2
		EQ2	DALY rate due to unsafe water sources	Responsible consumption and production	12.4	12.4.2
		EQ3	Municipal solid waste generation per capita	Industry, innovation and infrastructure	9.4	9.4.1
		GE1	Ratio of CO_2 emissions to population, including AFOLU	Climate action	13.2	13.2.2
		GE2	Ratio of non-CO_2 emissions to population, excluding AFOLU to population	Climate action	13.2	13.2.2
		GE3	Ratio of non-CO_2 emissions in agriculture and LUCF to population	Life below water	14.5	14.5.1
		BE1	Proportion of KBAs covered by protected areas	Life on land	15.1 15.4	15.1.2 15.4.1
		BE2	Share of forest area to total land area	Life on land	15.1	15.1.1
		BE3	Above-ground biomass in forest	Life on land	15.2	15.2.1
		CV1	Red List Index	Life on land	15.5	15.5.1
		CV3	Share of terrestrial and marine protected areas to total territorial areas	Life below water	14.5	14.5.1
	Green economic opportunities	GV2	Degree of integrated water resources management implementation, financing	Clean water and sanitation	6.5	6.5.1
		GV3	Total amount of funding to promote environmentally sound technologies per GDP	Partnerships for the goals	17.7	17.7.1
		GJ1	Share of green employment in total manufacturing	Industry, innovation and infrastructure	9.2.2	6.4
		GJ3	Employed population below international poverty line	No poverty	1.1	1.1.1
		GN3	Installed renewable energy-generating capacity (Watts per capita)	Affordable and clean energy	7.b	7.b.1
				Responsible consumption and production	12.a	12.a.1

* Details on SDG targets and indicators are available on these links: https://unstats.un.org/sdgs/indicators/database/; https://unstats.un.org/sdgs/metadata/

Figure 3. Links of the Green Growth Index to Sustainable Development Goals *(continued)*

B. Link of green growth indicators to SDGs and other sustainability targets

	Dimensions		Indicators [metrics]	Sustainable Development Goals (SDG)* Goal	Target	Indicator
Green Growth Index	Social inclusion	AB1	Population with access to basic services	Clean water and sanitation	6.1 6.2	6.1.1 6.2.1
				Affordable and clean energy	7.1	7.1.1 7.1.2
		AB3	Universal access to sustainable transport	Industry, innovation and infrastructure	11.2	11.2.1
		AB2	Prevalence of undernourishment	Zero Hunger	2.1	2.1.1
		GB1	Proportion of seats held by women in national parliaments	Gender equality	5.5	5.5.1
		GB2	Gender ratio of an account at a financial institution or mobile-money-service	Decent work and economic growth	8.10	8.10.2
		SE2	Population with access to basic services by urban/ rural, i.e. electricity	Affordable and clean energy	17.1	7.1.1
		SE3	Share of youth not in education, employment or training	Decent work and economic growth	8.6	8.6.1
		SP1	Proportion of population above statutory pensionable age receiving pension	No p overty	1.3	1.3.1
		SP2	Universal health coverage service coverage index	Good health and well-being	3.6	3.6.1
		SP3	Proportion of urban population living in slums	Sustainable cities and communities	11.1	11.11.1

* Details on SDG targets and indicators are available on these links: https://unstats.un.org/sdgs/indicators/database/; https://unstats.un.org/sdgs/metadata/

B. Link of green growth indicator s to SDGs and other sustainability targets

Dimensions		Indicators [metrics]	Link to SDGs and other targets: Sustainable Development Goals (SDGs)*		other targets
Efficient and sustainable resource use	EE3	Efficiency in sustainable transport	Industry, innovation and infrastructure	9.1	
	SL1	Soil nutrient budget	Life on land	15.3.1	Aichi
	SL2	Share of organic agriculture to total agricultural land area	Zero Hunger	2	Aichi
	SL3	Share of ruminant livestock population to agricultural area	Climate action	13.2	Climate
Natural capital protection	CV2	Tourism and recreation in coastal and marine areas	Responsible consumption and production	12.B	
	CV3	Share of terrestrial protected areas to total territorial areas	Life on land	15.1	Aichi
Green economic opportunities	GV1	Ratio of adjusted net savings to GNI, including particulate emission damage	Responsible consumption and production	12	
	GT1	Share of export of environmental goods to total export	Responsible consumption and production	12	
			Partnerships for the goals	17.7.1	
	GT2	CO_2 emissions embedded in trade	Climate action	13.2	Climate
Social inclusion	GB3	Laws and regulations for equal gender pay	Gender equality	5.C	
			Reduced equality	10.2	
	SE1	Inequality in income based on Palma ratio	No poverty	1.1.1 1.2.1	
			Reduced equality	10.1.1	

* Details on SDG targets and indicators are available on these links: https://unstats.un.org/sdgs/indicators/database/; https://unstats.un.org/sdgs/metadata/

1.2 Updates to the 2023 Green Growth

The scores in the 2024 Green Growth Index, as presented in this report, reflect updates and improvements to the data sources and indicator frameworks, making them more robust and aligned with the latest sustainability metrics. However, these enhancements mean that the 2024 scores are not directly comparable to those in the 2023 Green Growth Index. The key reasons for this are outlined below:

1. **Introduction of a new indicator (AB3)**: The indicator "Proportion of the population with convenient access to public transport (percent)" replaces the proxy variable "universal access to sustainable transport." The previous proxy variable relied on 2020 data published by Sum4All, while the new indicator is an SDG indicator with data spanning multiple years (2012, 2016–2023), providing improved consistency and comprehensive coverage.

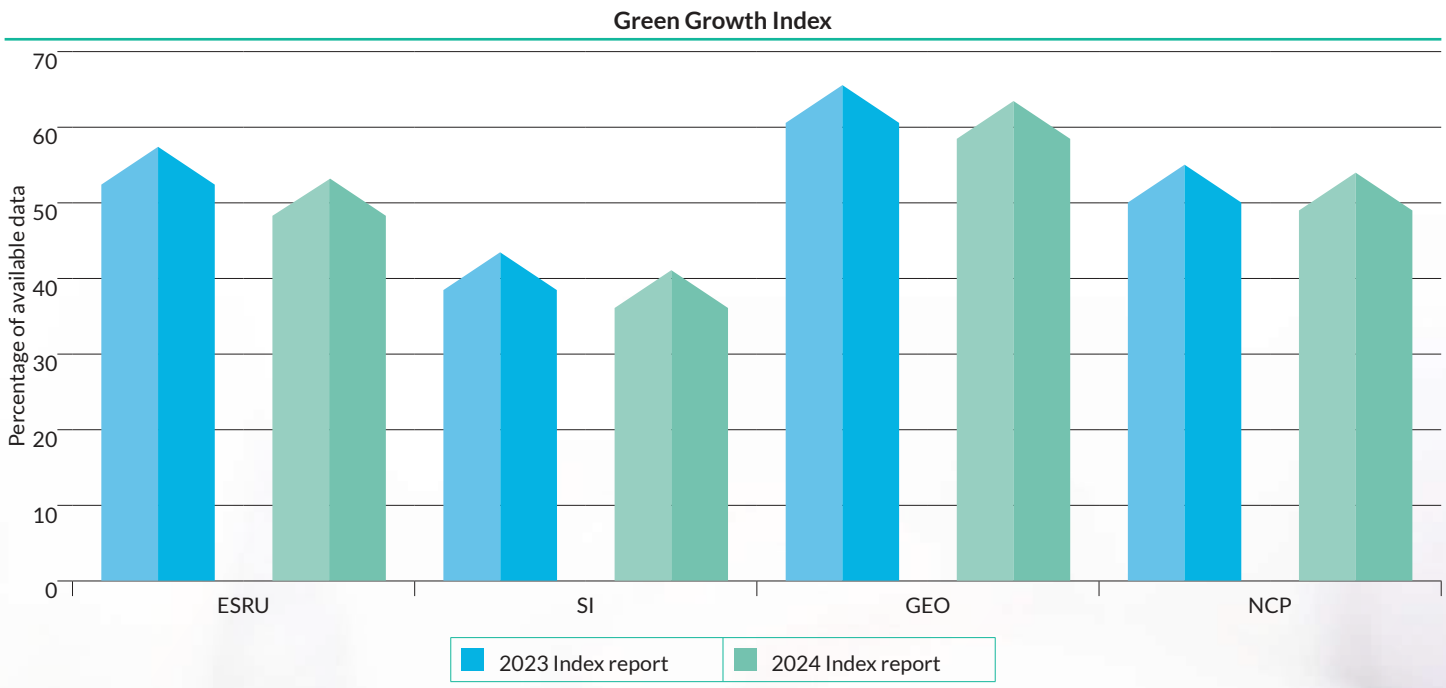
2. **New data source for GT1**: The data source for the indicator "Share of export of environmental goods to total export (percent)" has shifted to the International Monetary Fund (IMF). Previously, data were sourced from UNCOMTRADE, which provided only raw data for all goods and services. GGGI processed the data using OECD and APEC classifications of environmental goods. The IMF data source offers improved availability and reliability compared to UNCOMTRADE.

3. **Database updates**: Many indicators underwent database updates, leading to changes in their values for both recent and historical years. These changes reflect the incorporation of new knowledge and corrections in the datasets. Figure 4 provides a detailed overview of the data variations across the four green growth dimensions from 2010 to 2023.

4. **Decreased data points in 2024**: The number of data points for several indicators has declined, affecting scores for certain countries. Figure 4 illustrates the reduction in data availability, with the most significant decrease observed in the efficient and sustainable resource dimension. Section 6.2 offers a detailed discussion of this issue.

These updates demonstrate ongoing efforts to enhance the Green Growth Index's accuracy and relevance to policymaking. At the same time, they highlight the importance of interpreting scores within the evolving context of data and methodologies.

Figure 4. Percentage change in data availability for the indicators, by dimension



1.3 Purpose and structure of the report

As outlined in the previous section, the Index scores presented in this report are not directly comparable to those in the 2023 Green Growth Index Report due to methodological and data updates. To enable comparisons of scores and rankings over time, the 2024 Green Growth Index includes historical data for 154 countries (41 in Africa, 26 in the Americas, 44 in Asia, 39 in Europe, and 4 in Oceania) from 2010 to 2022. The report highlights key differences in green growth performance among countries and regions, as well as across dimensions and indicators. The first edition of the report provides a detailed explanation of the concept and methodology used to develop the Green Growth Index[10], with Annex 1**.** summarizing the methods for calculating the Index.

The structure of this report is as follows:

Chapter 1 Introduces the concept of the Green Growth Index and outlines improvements to its indicator framework. This chapter also briefly discusses the alignment of the indicators with the Sustainable Development Goals (SDGs).

Chapter 2 Provides a global overview of the Green Growth Index, using maps to offer a high-level perspective on countries' green growth performance. It also includes country and subregional dashboards for the Index, dimensions, and indicators, highlighting geographical differences in performance.

Chapter 3 Presents a regional analysis of green growth performance, focusing on the four dimensions of green growth across five regions (Africa, the Americas, Asia, Europe, and Oceania). This chapter also examines the trends in performance across the regions from 2020 to 2023.

Chapter 4 Analyzes the distribution of Green Growth Index scores by region and highlights the top-performing countries in each region.

Chapter 5 Features a detailed national Green Growth Index for Lao PDR, showcasing the 80 green growth indicators selected by national experts through participatory processes.

Chapter 6 Explores future developments for the Global Green Growth Index, including plans to replace proxy variables, improve data availability and confidence levels, and refine sustainability targets.

Chapter 7 Highlights GGGI projects that have applied the Green Growth Index and its Simulation Tool to support Member Countries and Regional Partners. These applications include greening National Development Plans and Frameworks and assessing the co-benefits of Low-Emission Development Strategies.

Chapter 8 Presents detailed statistical tables, providing comprehensive results for each country's Green Growth Index. These tables include scores for the Index, dimensions, indicator categories, and normalized indicators, and classify countries by region. They also include data for countries that could not be ranked due to insufficient data availability for certain indicators.

2 Global Overview

2.1 Maps

Figure 5 illustrates the maps summarizing the 2023 scores for the four dimensions of green growth: efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. Box 2 provides a detailed classification and interpretation of the dimension scores, categorized as follows: very low (1-20), low (20-40), moderate (40-60), high (60-80), and very high (80-100). Global performance across dimensions demonstrates moderate-to-high variability in efficient and sustainable resource use, a concentration of high scores in natural capital protection, notable disparities and many low-scoring countries in green economic opportunities, and a significant number of very high-scoring countries in social inclusion. The coverage of countries for each dimension varies, with scores available for 188 countries in efficient and sustainable resource use, 195 in natural capital protection, 154 in green economic opportunities, and 182 in social inclusion. These classifications and coverage reflect the diverse performance levels across regions and dimensions, providing a comprehensive global overview of green growth.

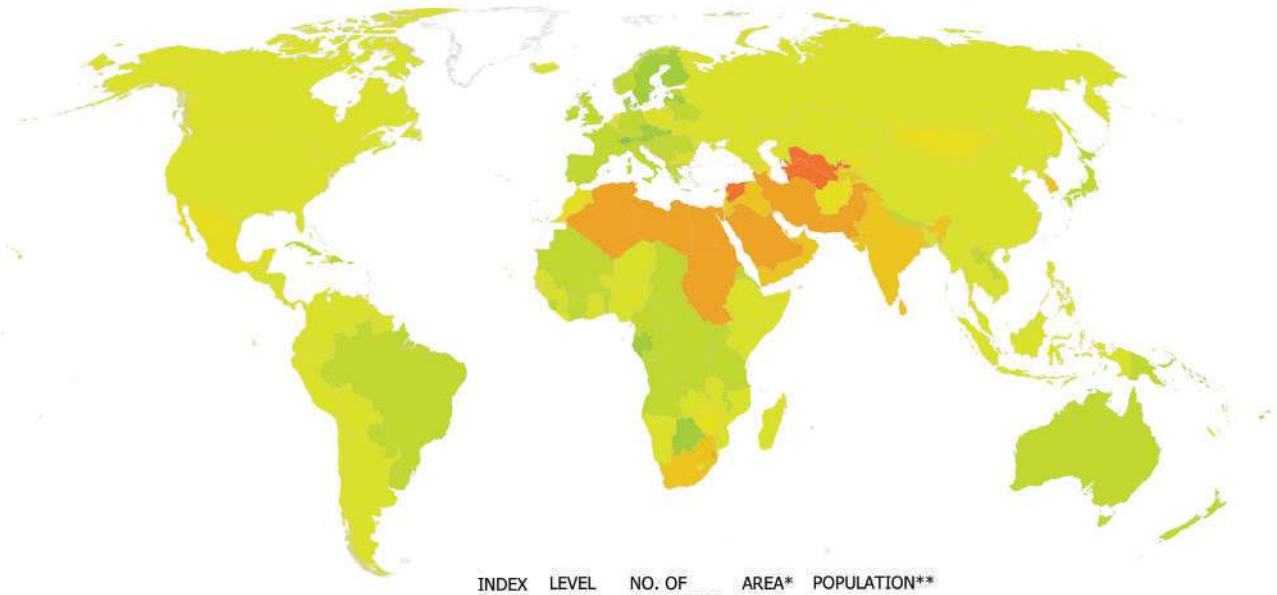
Of the 188 countries assessed for **efficient and sustainable resource use**, 40 percent achieved high scores, covering a land area of 32 million km² and representing 1.3 billion people, while 43 percent received moderate scores, spanning 96 million km² and approximately 4 billion people (Figure 5). Europe emerges as the best-performing region, with countries like Switzerland and Scandinavian nations such as Sweden and Denmark leading due to advanced environmental policies and robust governance frameworks. Switzerland, with a leading score of 82.02 in efficient and sustainable resource use, excels due to its inward urban development strategy aimed at optimizing land use and curbing urban sprawl[11], its integration of environmental issues across sectors through its Sustainable Development Strategy[12], and its strong commitment to water management, biodiversity conservation[13], renewable energy and energy efficiency[14]. In contrast, Africa and Asia exhibit considerable disparities. While countries like Gabon in Africa demonstrate strong environmental management, others, including Syria in Asia and Egypt in Africa, struggle due to conflict, weak infrastructure, and governance challenges. Notably, Syria holds the world's lowest ESRU score at 12.85, reflecting severe infrastructure damage and prolonged resource mismanagement caused by the ongoing civil war since 2011. Oceania and the Americas exhibit moderate ESRU scores, where larger nations with established sustainability frameworks, such as Brazil in the Americas and Australia in Oceania, outperform smaller or less developed countries. The results underscore the critical role of governance, economic stability, and effective resource management in driving regional efficient and sustainable resource use performance.

Among the 195 countries assessed for **natural capital protection**, the majority clustered in the high-score range, with 61 percent achieving high scores, covering a cumulative land area of 62 million km² and representing 4.3 billion people (Figure 5). Additionally, 28 percent of countries received moderate scores, spanning 85 million km² and representing 2.8 billion people. Europe ranks highest globally in natural capital protection (NCP), driven by strong environmental regulations, biodiversity policies, and consistent conservation investments. Slovakia, Europe's top performer with a score of 84.66, leads globally due to its robust environmental policies[15], biocultural landscape management integrating natural and cultural heritage[16], and an extensive network of protected areas, including national parks and landscape regions[17]. Africa and Asia show wider score variability; leading nations like Seychelles and Bhutan excel due to effective conservation frameworks, while others face challenges such as deforestation, desertification, and biodiversity loss. Oceania and the Americas generally achieve moderate scores, with top performers like New Zealand and Panama setting sustainability benchmarks. However, smaller and less developed nations struggle with environmental management due to limited resources and climate vulnerabilities. Small high-income countries such as Bhutan and Seychelles exemplify how targeted policies and conservation investments can yield exceptional environmental outcomes. In contrast, nations like Bahrain and Libya highlight how economic priorities, rapid urbanization, and conflict can hinder biodiversity and ecosystem protection. Bahrain, with a score of 23.11, ranks as the global lowest-performing country in natural capital protection due to extensive coastal development leading to significant habitat loss[18], reliance on desalination that generates harmful brine discharge on marine ecosystems[19], and limited establishment of protected areas alongside weak conservation policies[20].

Among the 154 countries assessed in **green economic opportunities**, 53 percent achieved moderate scores, covering approximately 98 million km² and 3.8 billion people, while 27 percent recorded low scores, spanning 42 million km² and 3.4 billion people (Figure 5). Europe dominates globally in GEO scores, with nations like Denmark and Germany excelling due to robust green innovation and investment policies. Denmark's high score of 61.16 in green economic opportunities reflects its leadership in green innovation, exemplified by its status as a global leader in wind energy[21], advancements in green technologies like energy-efficient solutions and sustainable construction[22], and implementation of progressive policies such as renewable energy subsidies and strong public-private partnerships, further fostering green innovation and employment[23]. Africa and Asia exhibit significant variability; while countries such as Burkina Faso and South Korea show strong performance, others like Niger and Timor-Leste face challenges stemming from resource constraints and gaps in policy implementation. Timor-Leste's very low score of 16.41 in green economic opportunities results from its dependency on oil and gas revenues, limiting

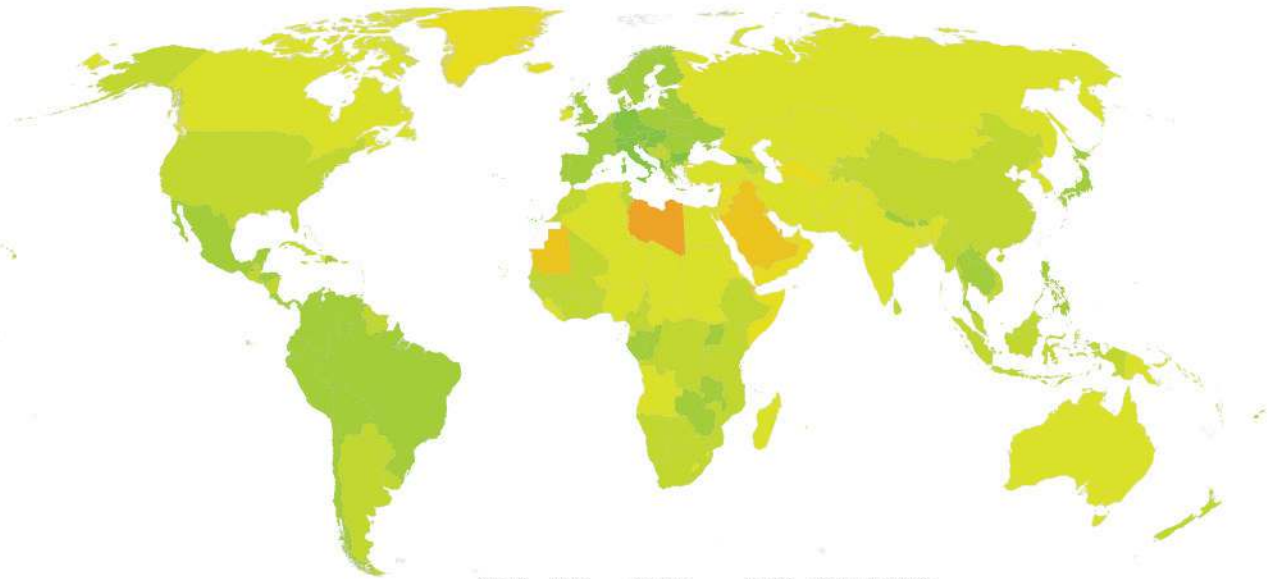
Figure 5. Sub-indices of the green growth dimensions for different countries, 2023

Efficient and Sustainable Resource Use



INDEX	LEVEL	NO. OF COUNTRIES	AREA*	POPULATION**
100	Very high	3	0.05	8.68
80	High	76	31.93	1298.41
60	Moderate	81	96.16	3950.08
40	Low	25	16.12	2115.03
20	Very low	3	1.16	55.97
0				

Natural Capital Protection

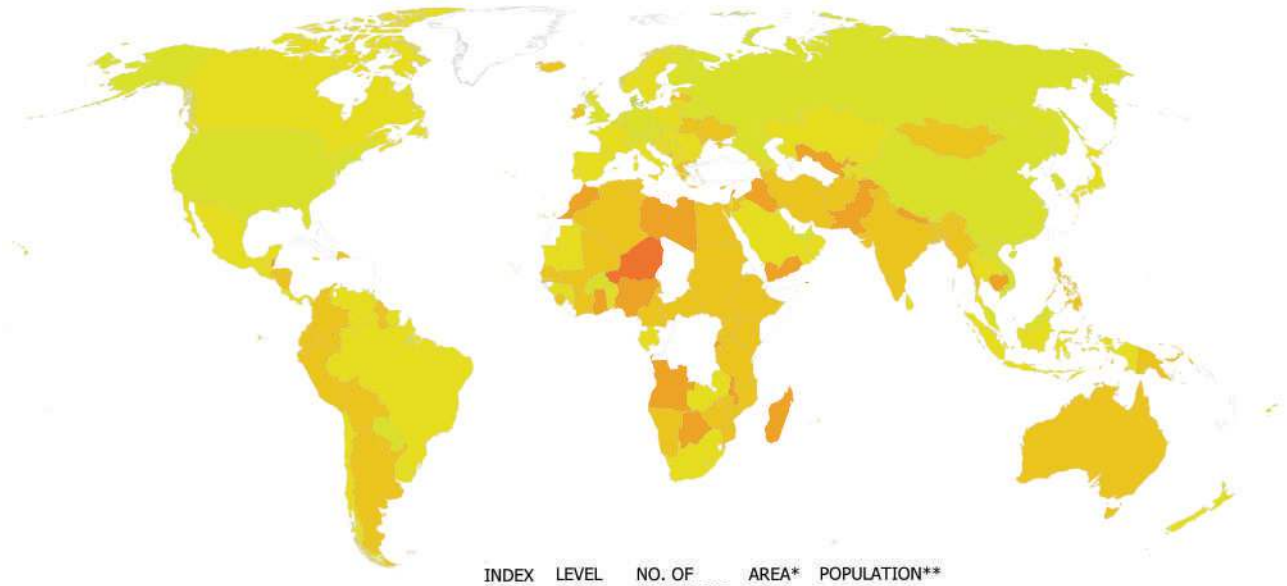


INDEX	LEVEL	NO. OF COUNTRIES	AREA*	POPULATION**
100	Very high	10	1.32	190.36
80	High	120	61.72	4334.41
60	Moderate	54	84.58	2809.76
40	Low	9	4.57	92.25
20	Very low	2	0.01	0.20
0				

* Million sq. km
** Million persons

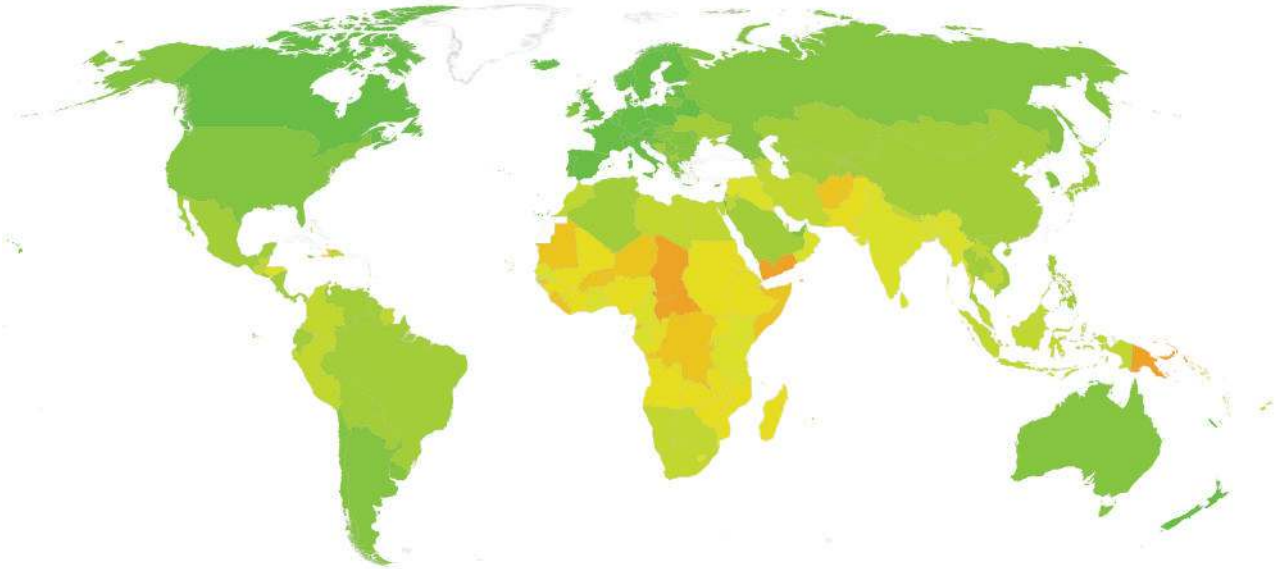
Figure 5. Sub-indices of the green growth dimensions for different countries, 2023 *(continued)*

Green Economic Opportunities



INDEX	LEVEL	NO. OF COUNTRIES	AREA*	POPULATION**
100	Very high	0	0	0
80	High	1	0.06	5.83
60	Moderate	82	97.47	3794.90
40	Low	67	42.03	3397.79
20	Very low	2	1.16	23.38
0				

Social Inclusion



INDEX	LEVEL	NO. OF COUNTRIES	AREA*	POPULATION**
100	Very high	49	75.54	1227.09
80	High	71	45.14	3201.55
60	Moderate	46	17.01	2677.05
40	Low	16	7.72	274.19
20	Very low	0	0	0
0				

* Million sq. km
** Million persons

investments in sustainable industries and renewable energy development[24], while inadequate infrastructure and institutional constraints further hinder the implementation of effective environmental policies and green innovation[25]. The stark contrast between high-performing regions, such as Europe, and lower-performing regions, including Africa and Oceania, highlights the urgent need for targeted investments and international collaboration to foster equitable green economic development globally.

Of the 182 countries assessed in **social inclusion**, 27 percent are very-high scoring, covering 75 million km² and representing 1.2 billion people; 39 percent are high-scoring, spanning 45 million km² and 3.2 billion people; and 25 percent are moderate-scoring, encompassing 17 million km² and 2.7 billion people (Figure 5). Europe leads globally in social inclusion (SI) scores due to robust welfare systems, high Human Development Index (HDI) levels, and equitable access to essential services. Finland, the top-scoring country in Europe and globally at 95.77, excels due to its comprehensive welfare state offering universal healthcare, free education, and inclusive social security[26], its global leadership in gender equality through equal pay policies and political representation[27], and significant investments in housing, public infrastructure, and social services ensuring equitable access[28]. In contrast, Africa and Asia display considerable disparities, with performance constrained by limited infrastructure and economic challenges. The Central African Republic, the lowest-scoring country in Africa and globally at 28.02, suffers from political instability, armed conflict, and weak institutional frameworks that hinder development and service delivery[29], while widespread poverty restricts access to basic social protection and income security[30]. The Americas and Oceania show moderate to high performance, with countries like Canada and New Zealand setting benchmarks through comprehensive social inclusion policies. These stark regional differences highlight the crucial roles of economic development, governance quality, and international assistance in advancing social inclusion globally.

The scores for the four green growth dimensions were aggregated using geometric means to derive the overall scores for the Green Growth Index (Annex 1). Only countries with scores for all four dimensions have scores for the Green Growth Index, corresponding to 154 countries in 2023 (Figure 6). They are distributed in different regions: 41 countries in Africa, 26 countries in the Americas, 44 countries in Asia, 39 countries in Europe, and only 4 in Oceania. No country scores very low or very high on the Green Growth Index. About 32 percent (50 countries) of the 154 countries show a high performance, scoring between 60 and 80. These countries, mainly in Europe, cover 84 million km² of land area and about three billion people.

Ninety-six countries have moderate performance, with scores between 40 and 60. The moderate-scoring countries cover 50 million km² of land and about four billion people. Eight countries, mainly in Asia, have a low score between 20 and 40 on the Green Growth Index. These countries cover seven million km² of land and 3.8 billion people. Switzerland, located in Western Europe, is the highest-scoring country with an overall Index score of 77.14; however, it is still far from reaching the sustainability target of 100. The lowest-scoring country is Yemen, with a Green Growth Index score of only 31.08.

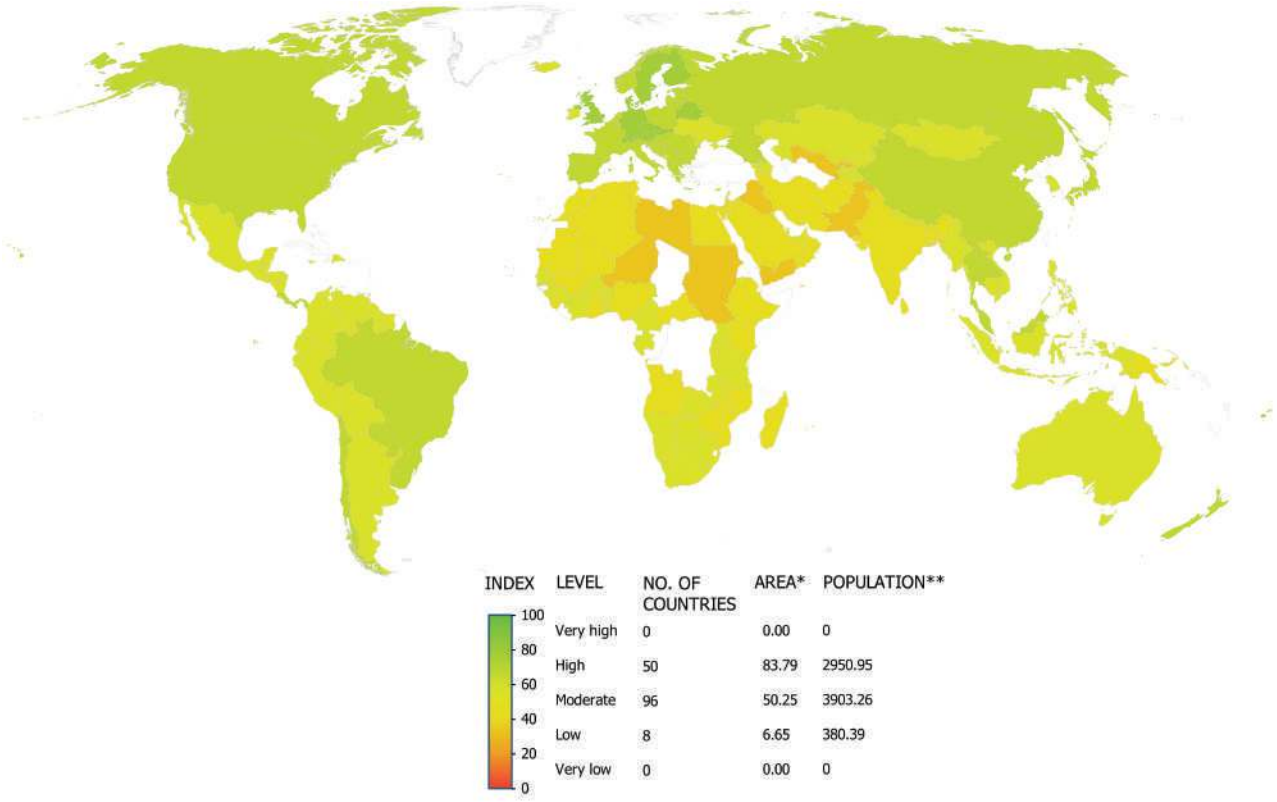
Compared to 2010, the Green Growth Index scores have generally improved for most countries by 2023. Figure 6 illustrates that 104 countries witnessed a moderate increase in their performance, ranging from 0 to 10 percent, from 2010 to 2023. They cover 93 million km² of land and represent about 6.1 billion people. Nine countries substantially increased scores, ranging from 10 to 20 percent. Notably, Iceland, located in Northern Europe, demonstrated a remarkable performance increase of over 20 percent. The green economic opportunities dimension mainly contributed to this increasing trend, with scores up to 36.67 in 2023 from 16.87 in 2010. Iceland's remarkable progress in green economic opportunities from 2010 to 2023 is driven by strategic investments in renewable energy, with hydroelectric and geothermal power supplying 70 and 30 percent of the country's electricity in 2024[31], complemented by its high adoption rate of electric vehicles, as battery-electric vehicles accounted for 50.1 percent of new registrations in 2023[32], and supported by proactive government policies, including carbon taxation and clean energy incentives fostering green employment[33].

Conversely, many countries (37) experienced declining scores, with decreases of up to -10 percent on the Green Growth Index. They cover 43 million km² of land and represent about 9.8 billion people. Libya and Morocco recorded a drop of more than 10 percent from 2010 to 2023. Morocco's poor Index performance is due to the decline in natural capital protection from 70.89 in 2010 to 66.09 in 2023, which is primarily attributed to climate change impacts intensifying water scarcity and desertification[34], deforestation and unsustainable land use causing soil degradation and ecosystem loss[35], and increased pollution from rapid urbanization and industrialization compromising air and water quality while further degrading natural habitats[36]. This analysis underscores the critical importance of tailoring region-specific interventions to address disparities, particularly in the dimensions of green economic opportunities and natural capital protection, where pronounced regional gaps are evident.

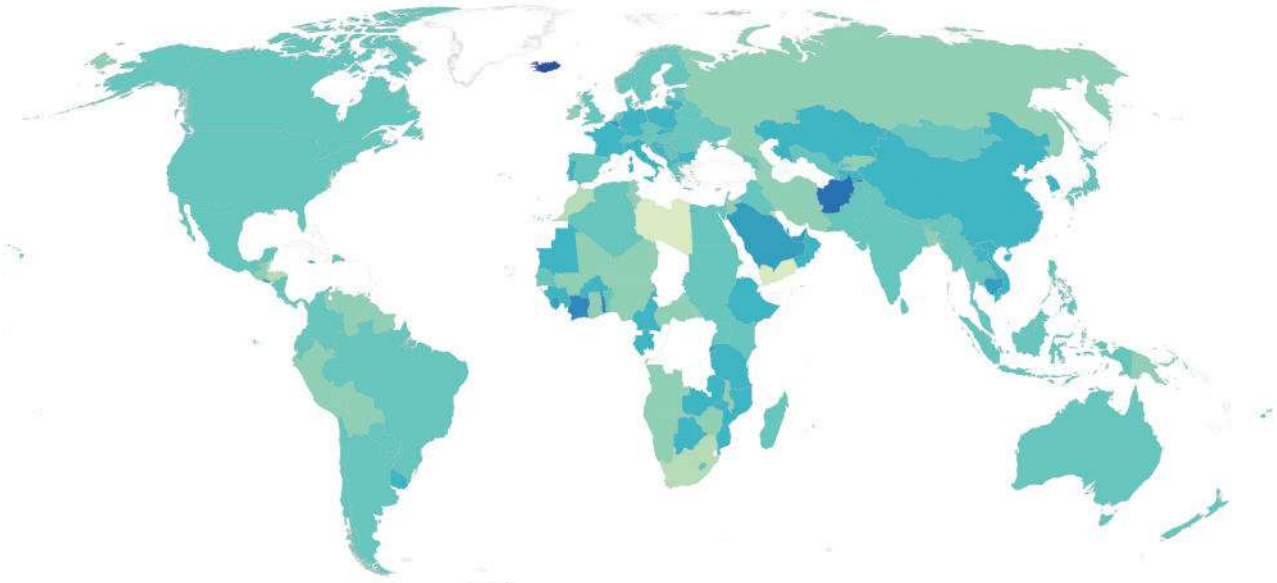
Box 2. Classification and interpretation of the scores

80–100 are very high scores, having reached or almost reached the target
60–80 are high scores, taking a strategic position to reach the target completely
40–60 are moderate scores, finding the right balance to move closer to the target
20–40 are low scores, identifying the right policies to align development toward achieving the target
1–20 are very low scores, requiring significant actions to improve position relative to the target

Figure 6. Performance Green Growth Index in 2023 (top) and change in Index scores from 2010 to 2023 (bottom)



LEVEL	NO. OF COUNTRIES	AREA*	POPULATION**
Very high	0	0.00	0
High	50	83.79	2950.95
Moderate	96	50.25	3903.26
Low	8	6.65	380.39
Very low	0	0.00	0



LEVEL	NO. OF COUNTRIES	AREA*	POPULATION**
Very high	2	0.82	37.10
High	9	2.38	128.38
Moderate	104	93.21	6051.22
Low	37	42.46	983.05
Very low	2	1.84	34.79

* Million sq. km
** Million persons

2.2 Dashboards

Table 1 presents a regional dashboard for the Green Growth Index, summarizing Index score changes for 154 countries from 2010 to 2023 across all four green growth dimensions. The countries are distributed as follows: 41 in Africa, 26 in the Americas, 44 in Asia, 39 in Europe, and 4 in Oceania. Multidirectional arrows in Table 1 indicate performance trends over time.

↑	Pointing straight up represents increasing performance, above 5% increase in scores
↗	Slightly slanting upward represents modest performance, between <5% and ≥ 1% increase in scores.
→	Pointing horizontally represents stable or almost no change in performace, between <1 and ≥ 0% change in scores
↘	Slightly slanting downward represents slight decline in performance, between < 0% and ≥ 5% decrease in scores
↓	Pointing straight down represents worsening performance, below -5% decrease in scores

The 2024 Green Growth Index highlights regional performance trends, including both progress and persistent challenges.

- In Africa, Gabon emerged as the best-performing country in 2023, rising from 54.97 in 2010 to 59.58 due to advancements in natural capital protection and efficient resource use. Conversely, Libya remained the lowest-ranked country, with its score falling from 38.03 to 33.85, reflecting challenges in green economic opportunities and environmental protection. Côte d'Ivoire demonstrated the most notable improvement, climbing from 27th to 7th, driven by resource management and green trade gains.
- In the Americas, the United States led the region with a score of 63.46 in 2023, up from 61.84 in 2010, driven by improvements in green economic opportunities and social inclusion. Barbados remained the least-performing country, with its score slightly increasing from 47.88 to 48.15, indicating limited progress in sustainable resource use and economic opportunities. Uruguay and Costa Rica rose significantly due to renewable energy investments and inclusive policies.
- In Asia, Japan ranked first in 2023, improving from 61.70 to 64.10 due to consistent performance across all dimensions, particularly natural capital protection and social inclusion. Yemen remained the lowest ranked, dropping from 34.83 to 31.08. Laos and Singapore showed substantial progress, with Laos rising from 10th to 2nd place and Singapore climbing ten ranks due to resource management and trade advancements.
- Europe maintained its position as the highest-performing region, with Switzerland leading globally, improving from 75.29 to 77.14, driven by excellence in social inclusion and natural capital protection. Montenegro ranked lowest in Europe, scoring 49.15 in 2023, up from 45.83 in 2010 but still trailing behind its peers. Iceland showed the most substantial improvement, with a 26 percent score increase due to progress in renewable energy and biodiversity conservation.
- In Oceania, New Zealand led the region with a score of 63.48 in 2023, up from 62.05 in 2010, reflecting a sustained focus on renewable energy and environmental conservation. Papua New Guinea remained the lowest ranked, with its score declining from 45.92 to 45.08, constrained by social inclusion and economic opportunities challenges. Fiji demonstrated steady progress, improving from 60.08 to 62.02 over the same period.

Table 1. Country dashboard for dimensions and Green Growth Index performance, by region

		Dimension scores (2024)				2010		2023		
Country	Sub-region*	ESRU	NCP	GEO	SI	Index	Rank	Index	Rank	Performance
AFRICA										
Gabon	Sub-Saharan Africa	73.50	74.58	41.46	55.46	54.97	4	59.58	1	↑
Mauritius	Sub-Saharan Africa	61.76	53.37	45.86	78.98	57.90	2	58.78	2	↗
Seychelles	Sub-Saharan Africa	50.50	78.77	33.97	77.65	52.54	6	56.91	3	↑
Togo	Sub-Saharan Africa	59.20	68.47	46.68	53.48	49.04	16	56.40	4	↑

Legend

10 Very low · 20 · 30 Low · 40 · 50 Moderate · 60 · 70 High · 80 · 100 Very high

↑ > 5% · ↗ ≤ 5% & > 1% · → ≤ 1% & > 0 · ↘ ≤ -1% & -5% · ↓ < -5%

Table 1. Country dashboard for dimensions and Green Growth Index performance, by region *(continued)*

Country	Sub-region*	ESRU	NCP	GEO	SI	Index	Rank	Index	Rank	Performance
Cabo Verde	Sub-Saharan Africa	46.79	61.75	45.17	71.48	59.28	1	55.27	5	↓
Namibia	Sub-Saharan Africa	57.09	63.38	37.09	67.50	55.27	3	54.86	6	↘
Cote d'Ivoire	Sub-Saharan Africa	69.91	66.13	39.25	49.25	47.21	27	54.67	7	↑
Gambia	Sub-Saharan Africa	59.95	63.57	41.39	56.59	51.73	7	54.66	8	↑
Burkina Faso	Sub-Saharan Africa	63.51	68.94	50.44	37.18	49.99	12	53.53	9	↑
Zambia	Sub-Saharan Africa	59.27	70.02	42.95	45.63	49.48	14	53.40	10	↑
Guinea	Sub-Saharan Africa	52.22	67.04	45.97	47.11	48.86	17	52.47	11	↑
Tanzania	Sub-Saharan Africa	62.35	65.84	35.61	51.68	48.37	20	52.43	12	↑
Cameroon	Sub-Saharan Africa	60.01	60.97	35.80	55.06	48.13	22	51.82	13	↑
South Africa	Sub-Saharan Africa	36.98	63.87	42.96	69.81	54.39	5	51.59	14	↘
Benin	Sub-Saharan Africa	61.86	63.66	42.40	41.71	51.03	8	51.37	15	→
Uganda	Sub-Saharan Africa	65.08	71.27	30.32	47.27	48.68	18	50.78	16	↗
Botswana	Sub-Saharan Africa	72.00	63.23	22.54	63.16	47.98	24	50.45	17	↗
Lesotho	Sub-Saharan Africa	49.54	49.82	47.04	55.78	48.23	21	50.45	18	↗
Senegal	Sub-Saharan Africa	56.22	64.88	30.62	57.58	48.50	19	50.36	19	↗
Zimbabwe	Sub-Saharan Africa	48.35	74.70	34.34	49.80	50.60	10	49.85	20	↘
Malawi	Sub-Saharan Africa	62.13	73.93	28.34	47.04	50.00	11	49.75	21	↘
Kenya	Sub-Saharan Africa	57.66	61.96	30.26	55.29	47.82	25	49.45	22	↗
Burundi	Sub-Saharan Africa	60.19	67.33	35.35	39.54	44.43	32	48.79	23	↑
Ethiopia	Sub-Saharan Africa	59.29	68.40	32.53	41.48	45.01	29	48.37	24	↑
Mali	Sub-Saharan Africa	60.74	61.83	30.89	46.76	49.57	13	48.26	25	↘
Rwanda	Sub-Saharan Africa	65.96	69.31	21.41	53.88	42.86	35	47.92	26	↑
Mozambique	Sub-Saharan Africa	54.63	67.05	34.83	40.65	45.22	28	47.72	27	↑
Ghana	Sub-Saharan Africa	58.51	65.08	23.56	54.60	47.49	26	47.05	28	↘
Morocco	Northern Africa	45.88	66.09	23.35	64.70	50.85	9	46.26	29	↓
Tunisia	Northern Africa	29.17	60.73	35.04	73.01	47.99	23	46.14	30	↘
Sierra Leone	Sub-Saharan Africa	65.59	59.92	31.98	35.99	41.82	36	46.12	31	↑
Mauritania	Sub-Saharan Africa	62.66	36.60	47.04	39.91	43.15	34	45.55	32	↑
Nigeria	Sub-Saharan Africa	59.05	58.47	22.29	44.69	44.55	30	43.06	33	↘
Central African Republic	Sub-Saharan Africa	64.80	55.54	33.50	28.02	43.88	33	42.87	34	↘
Algeria	Northern Africa	27.08	51.58	31.76	73.83	41.13	37	42.54	35	↗
Angola	Sub-Saharan Africa	66.43	58.48	20.82	40.07	44.45	31	42.43	36	↘
Madagascar	Sub-Saharan Africa	58.30	58.07	22.42	40.18	39.95	39	41.79	37	↑

Legend

10 20 30 40 50 60 70 80 80 100
Very low Low Moderate High Very high

↑ > 5% | ↗ ≤ 5% & > 1% | → ≤ 1% & > 0 | ↘ ≤ -1% & -5% | ↓ < -5%

Table 1. Country dashboard for dimensions and Green Growth Index performance, by region *(continued)*

Country	Sub-region*	ESRU	NCP	GEO	SI	Index	Rank	Index	Rank	Performance
Egypt	Northern Africa	22.51	55.84	35.65	66.42	40.04	38	41.53	38	↗
Niger	Sub-Saharan Africa	59.69	51.35	19.40	35.24	39.01	40	38.05	39	↘
Sudan	Northern Africa	27.28	50.97	32.47	40.72	36.25	42	36.83	40	↗
Libya	Northern Africa	27.06	29.01	25.38	65.94	38.03	41	33.85	41	↓
AMERICAS										
United States	Northern America	54.87	63.07	54.69	85.68	61.84	1	63.46	1	↗
Paraguay	Latin America and the Caribbean	64.48	66.50	50.12	72.77	59.98	3	62.88	2	↗
Brazil	Latin America and the Caribbean	62.96	71.38	43.49	75.50	61.72	2	61.98	3	→
Chile	Latin America and the Caribbean	51.40	74.34	44.08	83.07	59.38	5	61.16	4	↗
Uruguay	Latin America and the Caribbean	64.06	60.79	41.89	84.14	57.61	11	60.87	5	↑
Costa Rica	Latin America and the Caribbean	55.17	72.26	44.81	76.77	59.23	7	60.86	6	↗
Panama	Latin America and the Caribbean	59.08	75.60	42.56	71.80	59.26	6	60.78	7	↗
Canada	Northern America	53.57	59.46	45.07	91.08	57.31	12	60.13	8	↗
Jamaica	Latin America and the Caribbean	52.87	67.83	47.53	73.90	55.94	18	59.57	9	↑
Mexico	Latin America and the Caribbean	48.08	73.57	44.98	79.04	58.08	10	59.55	10	↗
El Salvador	Latin America and the Caribbean	55.19	64.50	45.15	71.11	54.59	24	58.14	11	↑
Bolivia	Latin America and the Caribbean	52.80	71.97	38.24	78.52	59.16	8	58.12	12	↘
Venezuela	Latin America and the Caribbean	53.83	70.75	41.83	70.09	58.22	9	57.80	13	↘
Suriname	Latin America and the Caribbean	51.64	64.42	47.61	69.66	59.47	4	57.63	14	↘
Colombia	Latin America and the Caribbean	56.10	71.79	39.73	68.91	55.51	20	57.62	15	↗
Nicaragua	Latin America and the Caribbean	56.31	69.77	39.03	70.78	56.11	17	57.39	16	↗
Argentina	Latin America and the Caribbean	55.45	60.33	39.76	80.52	57.12	13	57.21	17	→
Dominican Republic	Latin America and the Caribbean	60.06	75.06	35.39	66.10	56.13	16	56.98	18	↗
Ecuador	Latin America and the Caribbean	53.95	70.63	36.99	70.74	55.48	21	56.20	19	→
Peru	Latin America and the Caribbean	56.42	71.45	36.38	67.88	56.28	15	56.17	20	→
Guatemala	Latin America and the Caribbean	58.65	66.55	40.47	60.12	55.70	19	55.51	21	→
Honduras	Latin America and the Caribbean	57.31	72.74	37.14	54.77	56.98	14	53.96	22	↘

Legend

10 Very low | 20 Low | 30 40 Moderate | 50 60 70 High | 80 80 100 Very high

↑ > 5% | ↗ ≤ 5% & > 1% | → ≤ 1% & > 0 | ↘ ≤ -1% & -5% | ↓ < -5%

Table 1. Country dashboard for dimensions and Green Growth Index performance, by region *(continued)*

Country	Sub-region*	ESRU	NCP	GEO	SI	Index	Rank	Index	Rank	Performance
Guyana	Latin America and the Caribbean	53.21	62.20	33.39	75.08	55.37	23	53.67	23	↘
Belize	Latin America and the Caribbean	55.70	72.15	28.68	64.98	55.44	22	52.31	24	↓
Trinidad and Tobago	Latin America and the Caribbean	31.16	54.16	50.76	77.93	51.54	25	50.83	25	↘
Barbados	Latin America and the Caribbean	35.89	58.98	36.01	70.52	47.88	26	48.15	26	→
ASIA										
Japan	Eastern Asia	61.70	73.71	47.33	78.42	61.70	2	64.10	1	↗
Laos	South-eastern Asia	61.78	76.47	56.30	60.58	57.65	10	63.36	2	↑
Georgia	Western Asia	52.75	73.67	49.59	80.52	60.47	4	62.76	3	↗
China	Eastern Asia	53.60	63.61	56.85	76.83	58.20	8	62.12	4	↑
Thailand	South-eastern Asia	54.80	73.40	48.35	74.63	60.31	5	61.72	5	↗
Bhutan	Southern Asia	56.91	79.85	52.04	59.90	60.71	3	61.35	6	→
Malaysia	South-eastern Asia	52.39	67.52	54.26	69.65	58.47	6	60.47	7	↗
Philippines	South-eastern Asia	58.33	75.09	39.60	72.07	56.96	11	59.46	8	↗
Vietnam	South-eastern Asia	54.60	62.59	50.23	72.12	55.74	13	59.32	9	↑
Cyprus	Western Asia	58.23	74.00	34.05	83.72	62.32	1	59.20	10	↘
Indonesia	South-eastern Asia	54.39	64.50	47.28	67.13	55.62	14	57.77	11	↗
Maldives	Southern Asia	52.10	52.16	52.21	77.71	58.25	7	57.62	12	↘
Armenia	Western Asia	40.08	69.80	48.41	78.55	56.40	12	57.11	13	→
South Korea	Eastern Asia	37.12	57.85	58.31	82.03	53.87	17	56.61	14	↗
Kyrgyz Republic	Central Asia	48.83	61.93	41.42	75.40	55.48	15	55.43	15	→
Israel	Western Asia	48.14	48.69	45.81	85.95	54.76	16	55.12	16	↗
Azerbaijan	Western Asia	42.63	65.00	47.80	69.56	57.79	9	55.09	17	↘
Kazakhstan	Central Asia	51.35	53.86	41.53	78.42	50.12	21	54.78	18	↑
Nepal	Southern Asia	60.99	73.56	26.34	69.42	52.35	18	53.52	19	↗
United Arab Emirates	Western Asia	36.72	47.88	53.72	84.14	46.45	28	53.10	20	↑
Brunei Darussalam	South-eastern Asia	45.39	56.23	43.37	68.25	51.69	19	52.43	21	→
Singapore	South-eastern Asia	28.85	59.39	50.25	83.85	45.55	32	51.83	22	↑
Cambodia	South-eastern Asia	56.28	78.06	26.14	61.75	46.18	29	51.60	23	↑
Tajikistan	Central Asia	36.04	60.24	45.17	71.94	48.57	25	51.54	24	↑
Qatar	Western Asia	46.61	39.98	55.98	66.24	48.55	26	51.27	25	↑
Myanmar	South-eastern Asia	58.41	60.62	33.92	56.58	49.21	23	51.05	26	↗
Mongolia	Eastern Asia	44.34	55.07	35.07	76.23	50.01	22	50.55	27	→

Legend

10 20 30 40 50 60 70 80 80 100
Very low Low Moderate High Very high

↑ > 5% | ↗ ≤ 5% & > 1% | → ≤ 1% & > 0 | ↘ ≤ -1% & -5% | ↓ < -5%

Table 1. Country dashboard for dimensions and Green Growth Index performance, by region *(continued)*

Country	Sub-region*	ESRU	NCP	GEO	SI	Index	Rank	Index	Rank	Performance
Sri Lanka	Southern Asia	35.11	64.07	40.00	59.33	45.86	30	48.07	28	↗
Bangladesh	Southern Asia	52.51	54.84	31.02	59.10	48.88	24	47.93	29	↘
Timor-Leste	South-eastern Asia	62.74	64.81	16.41	74.88	50.46	20	47.28	30	↓
India	Southern Asia	39.21	54.35	35.11	59.95	43.92	34	46.02	31	↗
Palestine	Western Asia	47.27	32.83	51.75	53.71	46.54	27	45.57	32	↘
Jordan	Western Asia	34.64	48.45	36.73	62.37	44.49	33	44.28	33	→
Oman	Western Asia	32.48	41.20	47.54	57.42	41.07	37	43.72	34	↗
Lebanon	Western Asia	44.40	58.85	23.52	59.25	45.59	31	43.68	35	↘
Saudi Arabia	Western Asia	29.93	36.89	40.82	73.92	38.07	38	42.72	36	↑
Afghanistan	Southern Asia	44.65	54.98	33.47	37.05	33.89	43	41.77	37	↑
Iran	Southern Asia	22.10	57.94	34.54	68.53	42.02	36	41.72	38	↘
Kuwait	Western Asia	28.42	40.66	45.36	57.22	43.88	35	41.62	39	↘
Uzbekistan	Central Asia	19.36	57.37	28.59	70.36	37.08	40	38.66	40	↗
Iraq	Western Asia	33.88	37.56	29.18	58.68	37.77	39	38.42	41	↗
Pakistan	Southern Asia	24.42	52.51	27.17	48.82	35.25	41	36.11	42	↗
Bahrain	Western Asia	33.91	23.11	39.40	53.34	32.82	44	35.82	43	↑
Yemen	Western Asia	31.25	40.15	25.54	29.12	34.83	42	31.08	44	↓
EUROPE										
Switzerland	Western Europe	82.02	80.12	57.01	94.53	75.29	1	77.14	1	↗
Denmark	Northern Europe	78.42	73.71	61.16	94.67	73.73	2	76.06	2	↗
Austria	Western Europe	79.64	80.41	53.13	94.59	73.27	3	75.32	3	↗
Germany	Western Europe	67.16	82.97	59.81	93.44	69.75	6	74.70	4	↑
Czechia	Eastern Europe	77.42	81.96	52.25	91.27	72.29	5	74.17	5	↗
Sweden	Northern Europe	79.49	78.43	48.98	95.59	72.51	4	73.50	6	→
Slovakia	Eastern Europe	76.05	84.66	49.61	87.81	68.45	9	72.77	7	↑
Finland	Northern Europe	70.22	72.35	54.00	95.77	69.26	8	71.59	8	↗
United Kingdom	Northern Europe	68.45	79.00	51.37	93.83	69.29	7	71.45	9	↗
Belarus	Eastern Europe	60.66	78.82	56.90	90.28	67.55	11	70.40	10	↗
Italy	Southern Europe	65.03	80.38	46.98	91.75	65.56	16	68.90	11	↑
Hungary	Eastern Europe	66.93	81.84	47.89	85.38	68.43	10	68.80	12	→
France	Western Europe	67.60	79.14	44.24	94.07	64.76	18	68.69	13	↑
Netherlands	Western Europe	59.58	73.47	52.32	94.02	66.31	15	68.12	14	↗
Estonia	Northern Europe	65.28	77.51	46.38	91.74	66.81	13	68.12	15	↗

Legend

Table 1. Country dashboard for dimensions and Green Growth Index performance, by region *(continued)*

Country	Sub-region*	ESRU	NCP	GEO	SI	Index	Rank	Index	Rank	Performance
Slovenia	Southern Europe	62.06	78.81	48.79	90.04	65.47	17	68.08	16	↗
Norway	Northern Europe	63.89	74.92	46.75	95.05	67.16	12	67.91	17	→
Lithuania	Northern Europe	69.83	74.57	43.99	89.98	63.78	21	67.38	18	↑
Portugal	Southern Europe	64.28	79.51	42.86	93.35	63.90	20	67.25	19	↗
Croatia	Southern Europe	65.21	83.78	41.36	90.40	61.93	24	67.23	20	↑
Latvia	Northern Europe	71.95	78.52	39.30	90.58	64.21	19	66.96	21	↗
Luxembourg	Western Europe	73.96	77.64	36.88	92.79	66.80	14	66.58	22	→
Albania	Southern Europe	64.93	83.45	41.91	82.66	62.07	23	65.82	23	↑
Spain	Southern Europe	60.69	76.70	42.91	93.48	63.37	22	65.73	24	↗
Poland	Eastern Europe	59.31	75.99	43.96	90.31	61.21	26	65.04	25	↑
Belgium	Western Europe	51.34	77.04	47.29	95.52	57.87	33	65.01	26	↑
Romania	Eastern Europe	63.90	78.06	40.22	86.17	61.88	25	64.48	27	↗
Bulgaria	Eastern Europe	52.62	80.54	42.48	86.73	59.49	30	62.86	28	↑
Bosnia and Herzegovina	Southern Europe	66.00	65.51	42.96	76.91	56.29	37	61.48	29	↑
North Macedonia	Southern Europe	56.83	75.18	41.62	79.11	57.82	34	61.24	30	↑
Serbia	Southern Europe	61.77	69.44	40.10	81.27	59.52	29	61.14	31	↗
Greece	Southern Europe	62.87	77.84	30.46	89.44	60.42	27	60.43	32	→
Russia	Eastern Europe	54.19	58.36	51.38	80.76	60.26	28	60.19	33	→
Moldova	Eastern Europe	59.83	74.00	32.50	85.98	56.50	36	59.31	34	↗
Ukraine	Eastern Europe	55.86	72.78	39.62	74.78	58.02	32	58.91	35	↗
Ireland	Northern Europe	61.42	58.04	34.39	89.61	58.30	31	57.57	36	↘
Iceland	Northern Europe	59.07	45.24	36.67	93.90	43.63	39	55.08	37	↑
Malta	Southern Europe	45.62	74.23	28.41	86.91	57.72	35	53.77	38	↓
Montenegro	Southern Europe	30.77	67.75	34.92	80.16	45.83	38	49.15	39	↑
OCEANIA										
New Zealand	Australia and New Zealand	60.39	68.99	40.80	95.54	62.05	1	63.48	1	↗
Fiji	Melanesia	61.95	68.18	54.06	64.77	60.08	2	62.02	2	↗
Australia	Australia and New Zealand	65.27	52.66	37.56	89.94	56.79	3	58.38	3	↗
Papua New Guinea	Melanesia	68.26	52.96	39.94	28.61	45.92	4	45.08	4	↘

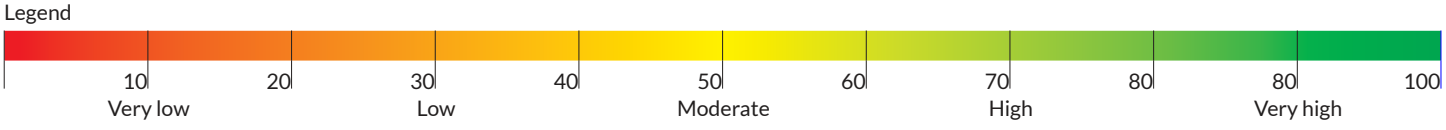
Legend

10 Very low | 20 | 30 Low | 40 | 50 Moderate | 60 | 70 High | 80 | 80 | 100 Very high

↑ > 5% | ↗ ≤ 5% & > 1% | → ≤ 1% & > 0 | ↘ ≤ -1% & -5% | ↓ < -5%

Figure 7. Dashboard of pillars in each green growth dimension, by sub-regions in 2023

Sub-regions	Efficient and sustainable resource use				Natural capital protection			
	EE	EW	SL	ME	EQ	GE	BE	CV
Eastern Africa	56.13	47.58	70.56	73.83	66.56	84.38	49.72	63.76
Middle Africa	56.70	53.11	88.17	72.83	64.51	71.51	66.36	62.42
Northern Africa	40.81	5.50	70.42	74.00	77.69	80.17	26.21	53.15
Southern Africa	56.71	34.88	71.06	68.33	65.36	69.24	45.36	68.41
Western Africa	58.97	44.78	70.23	69.57	52.93	87.78	52.31	62.33
Caribbean	42.31	41.67	71.87	83.92	81.04	76.86	54.91	57.54
Central America	60.06	35.22	61.28	75.31	85.49	79.81	61.33	62.98
Northern America	52.91	42.72	60.46	81.92	77.97	44.63	37.81	67.07
South America	54.60	41.74	65.09	73.08	87.22	61.80	62.41	64.28
Central Asia	35.44	15.47	61.25	78.34	84.69	66.55	24.25	75.94
Eastern Asia	48.47	40.78	57.48	74.74	77.67	70.85	47.64	65.39
South-Eastern Asia	54.73	41.23	58.37	70.22	86.33	70.80	58.61	59.86
Southern Asia	51.15	26.35	61.06	73.78	70.77	86.40	42.63	56.96
Western Asia	37.48	17.76	64.47	65.07	76.18	66.69	24.91	55.29
Eastern Europe	47.20	52.50	77.35	85.36	85.75	72.50	70.57	80.84
Northern Europe	68.92	55.60	74.06	78.51	86.42	69.67	53.34	72.96
Southern Europe	59.15	35.81	71.23	83.20	85.37	78.29	59.17	79.43
Western Europe	64.45	61.93	76.32	83.71	83.26	77.48	61.51	88.76
Australia and New Zealand	60.26	52.81	79.77	64.74	84.61	34.02	64.27	71.06
Melanesia	49.96	39.79	73.53	78.52	82.94	76.13	51.19	49.00
Micronesia	33.86		91.69	84.68	84.13	88.42	47.96	47.23
Polynesia	52.73		78.06	87.08	90.96	85.59	43.44	63.11



Green economic opportunities				Social inclusion				Sub-regions
GV	GT	GJ	GN	AB	GB	SE	SP	
36.26	60.85	19.87	30.66	40.23	73.16	72.45	32.34	Eastern Africa
30.64	55.70	34.16	31.43	36.99	55.50	61.76	26.18	Middle Africa
43.22	61.80	29.14	14.69	66.44	52.52	83.34	63.42	Northern Africa
40.79	65.09	22.61	26.44	55.28	75.31	61.72	70.44	Southern Africa
39.59	58.92	21.12	28.86	45.25	55.34	68.28	28.97	Western Africa
39.21	71.74	55.15	32.74	66.73	64.20	79.78	73.87	Caribbean
38.42	66.54	46.20	24.88	66.10	69.86	79.09	62.26	Central America
58.96	57.73	38.99	46.82	87.02	81.08	92.92	95.19	Northern America
35.85	61.74	45.79	33.76	67.87	77.07	81.75	75.17	South America
41.25	60.45	30.97	38.48	70.97	61.65	89.32	83.67	Central Asia
55.00	68.41	43.07	33.56	76.92	63.84	95.09	81.36	Eastern Asia
54.32	66.22	38.18	27.64	66.82	70.64	90.19	57.05	South-Eastern Asia
42.27	58.34	31.23	29.67	65.82	53.33	84.28	46.67	Southern Asia
44.85	65.62	50.33	26.39	69.04	54.03	88.18	63.64	Western Asia
58.94	73.12	41.91	24.84	90.79	73.46	93.86	88.13	Eastern Europe
61.25	69.47	27.44	42.57	96.05	90.27	95.05	91.17	Northern Europe
47.07	67.04	32.84	28.10	89.00	80.00	91.75	85.46	Southern Europe
68.54	68.91	31.53	46.62	96.76	91.52	94.73	92.98	Western Europe
49.42	52.40	24.46	39.66	95.30	93.49	92.99	89.40	Australia and New Zealand
41.85	67.56		42.04	60.10	26.40	81.02	59.46	Melanesia
18.69			25.08	58.67	49.01	81.73	73.64	Micronesia
43.61			31.73	61.47	46.74	79.64	67.40	Polynesia

Definitions:
EE – Efficient and sustainable resource use, EW – Efficient and sustainable water use, SL – Sustainable land use, ME – Material use efficiency
EQ – Environmental Quality, GE – GHG emissions reduction, BE – Biodiversity and ecosystem protection, CV – Cultural and social value
GV – Green investment, GT – Green trade, GJ – Green employment, GN – Green innovation
AB – Access to basic services and resources, GB – Gender balance, SE – Social equality, SP – Social protection

The 2024 Green Growth Index highlights notable disparities across its four dimensions: efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. Each dimension reveals specific strengths and weaknesses influenced by regional performance across various pillars (Figure 7).

In efficient and sustainable resource use, sustainable land use (SL) emerges as a key strength in Oceania, with Micronesia scoring 91.69, followed by Middle Africa at 88.17 and Eastern Europe at 77.35. Material use efficiency (ME) also demonstrates strong results, with Polynesia leading at 87.08, the Caribbean and Northern America scoring over 81, Central Asia at 78.34, and Northern Africa achieving 74. However, efficient and sustainable water use (EW) remains a critical challenge. Northern Africa scores only 5.50, while Central Asia and Western Asia lag at 15.47 and 17.76, respectively. Southern Europe (35.81) and Central America (35.22) also face significant challenges in water management.

Natural capital protection reveals mixed results, with environmental quality (EQ) as a major strength. Polynesia in Oceania scores an impressive 90.96, while Northern Europe achieves 86.42. In the Americas, Central and South America score above 85, and South-Eastern Asia records 86.33. Africa sees notable GHG emissions reduction (GE) performance, with Western and Eastern Africa scoring 87.78 and 84.38, respectively. However, biodiversity and ecosystem protection (BE) underperforms globally, with Northern Europe at 53.34, Polynesia in Oceania at 43.44, Northern America at 37.81, and Northern Africa at a concerning 26.21.

Performance in green economic opportunities remains uneven, with green trade (GT) standing out as a strong pillar. Eastern Europe scores 73.12, Caribbean 71.74, Eastern Asia 68.41, and Southern Africa 65.09. However, green innovation (GN) remains weak in many regions, including Northern Africa (14.69), Micronesia (25.00), Western Asia (26.39), and Eastern Europe (28.97). Similarly, green employment (GJ) scores low, with Northern Europe at 27.44 and Eastern Africa at 19.87. Green investment (GV) fares better in Oceania, led by Australia and New Zealand at 49.41.

Social inclusion exhibits notable strengths in social equity (SE), with Northern America scoring 92.92, Western and Northern Europe exceeding 94, and Eastern Asia reaching 95.09. Australia and New Zealand lead Oceania with 92.99, while Northern Africa scores 83.34. Gender balance (GB) is another success story in Western and Northern Europe, where scores exceed 90, and Southern Africa records 75.31. However, social protection (SP) faces challenges, particularly in Middle and Western Africa, where scores are low at 26.18

and 28.97, respectively. Southern Asia also struggles with a score of 46.67. Gender balance remains problematic in Oceania's Melanesia, scoring only 26.40.

Overall, the Green Growth Index underscores global disparities in green growth performance. While material use efficiency, social equity, and environmental quality drive positive results, persistent gaps in efficient and sustainable water use, biodiversity and ecosystem protection, and green innovation highlight critical areas requiring focused policy interventions and increased investment. Addressing these weaknesses will enable a comprehensive global transition toward sustainable development.

3 Regional Outlook

3.1 Subregional Performance

The Green Growth Index and its dimension scores are presented for countries across five geographic regions: Africa, the Americas, Asia, Europe, and Oceania. An in-depth analysis is conducted at the subregional level to provide a comprehensive understanding of the Green Growth Index results, focusing on the scores for efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. The Green Growth Index is calculated as the geometric mean of these dimensions, ensuring a balanced representation of performance across four dimensions. Additionally, changes in Green Growth Index scores by subregion and dimension were examined from 2010 to 2023, offering valuable insights into each region's economic and environmental progress over time.

3.1.1 Africa

The Green Growth Index encompasses the results for five distinct African subregions: Eastern, Middle, Northern, Southern, and Western. Figure 8 highlights varying performances in the African subregions across the four dimensions of the Green Growth Index, underscoring strengths and challenges:

The Green Growth Index encompasses the results for five distinct African subregions: Eastern, Middle, Northern, Southern, and Western. Figure 8 highlights varying performances in the African subregions across the four dimensions of the Green Growth Index, underscoring strengths and challenges:

- With an Index score of 50.46, **Eastern Africa** performs well in efficient and sustainable resource use, scoring 60.36, the second highest in the region after Middle Africa. However, it lags in green economic opportunities with a score of 32.94, highlighting challenges in fostering green employment and innovation. Compared to Southern Africa, which leads the region in green economic opportunities with 37.41, Eastern Africa's weaker performance in this dimension reveals gaps in greening the economy. Its social inclusion score of 48.86 lags behind Northern and Southern Africa, scoring over 64.

- Scoring 49.18 on the Index, **Middle Africa** leads in efficient and sustainable resource use with a score of 65.40. However, like Eastern Africa, it struggles in green economic opportunities with a score of 32.89, nearly 5 points behind Southern Africa. In social inclusion, Middle Africa records the lowest score in the region at 41.24, reflecting challenges in this dimension compared to Southern Africa's leading score of 64.13.

- With the lowest Index score of 41.19, **Northern Africa** performs poorly in efficient and sustainable resource use and green economic opportunities, scoring 29.83 and 30.61, respectively. However, Northern Africa excels in social inclusion, achieving a high score of 64.10, second to Southern Africa. Its strong social inclusion performance contrasts sharply with its low efficient and sustainable resource use score, indicating significant unequal development across dimensions.

Figure 8. Green Growth Index and dimension subindices in the African subregions, 2023

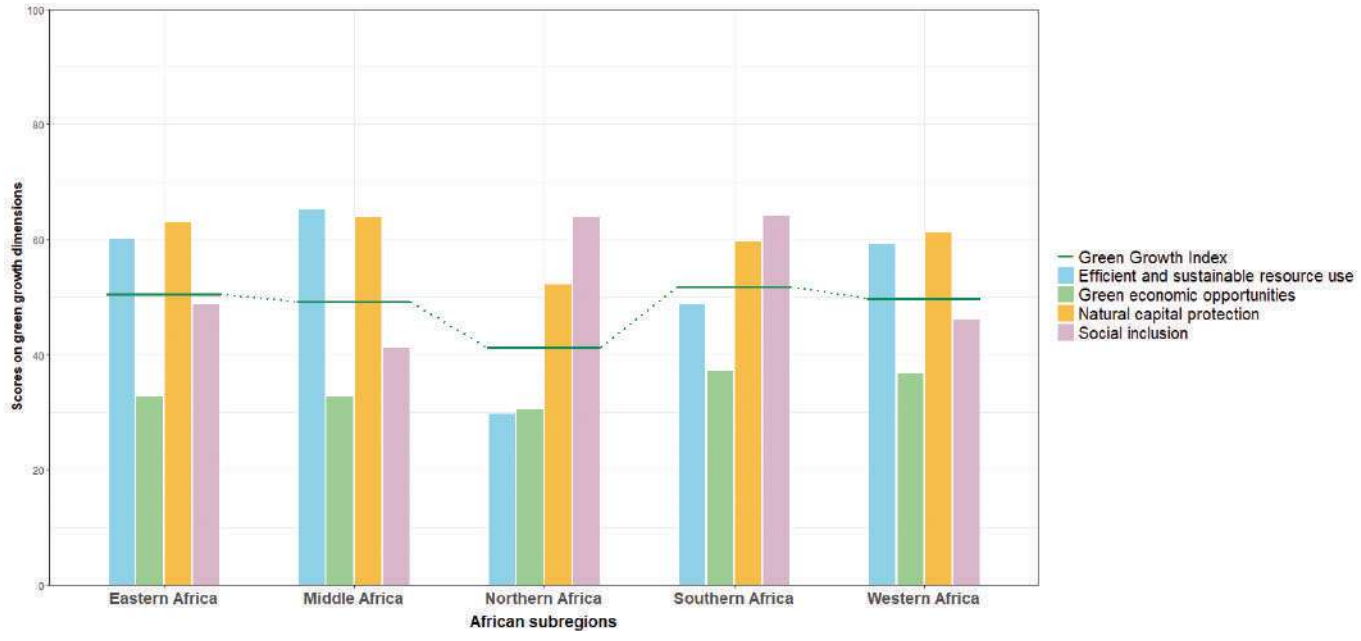
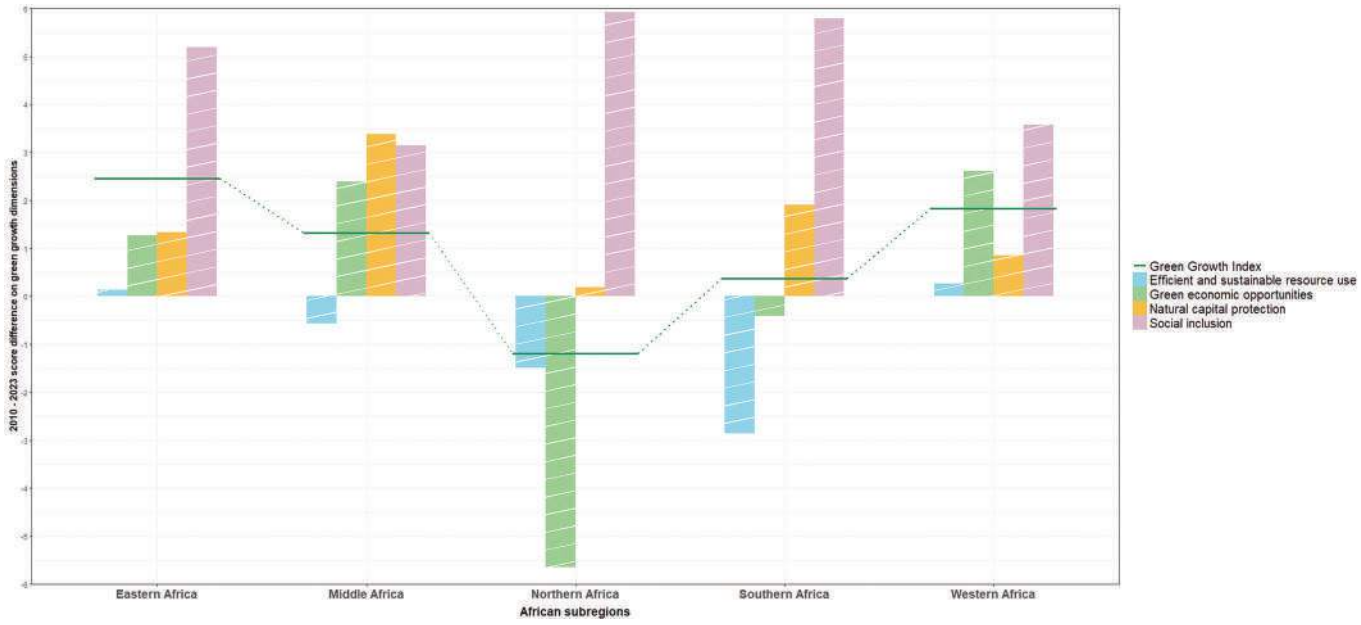


Figure 9. Score difference for the Green Growth Index and dimension subindices in the African subregions, 2010-2023



- Leading the region with an Index score of 51.84, **Southern Africa** excels in green economic opportunities with the highest score of 37.41. Its strong performance in this dimension is complemented by leading social inclusion at 64.13, highlighting a balanced approach to economic and social dimensions. However, its efficient and sustainable resource use score of 48.92 is weaker compared to Middle and Eastern Africa.

- With an Index score of 49.77, **Western Africa** shows a relatively balanced performance across dimensions, except for green economic opportunities. Its natural capital protection score of 61.25 is strong but lags in social inclusion with a score of 46.11. Compared to Middle Africa's top efficient and sustainable resource use score of 65.40, Western Africa's performance in this dimension of 59.23 indicates opportunities for improvement.

The percentage change in scores between 2010 and 2023 for African subregions reveals diverse trends across sustainability dimensions, with critical differences between regions (Figure 9). Eastern Africa achieved the highest Green Growth Index improvement at 2.45 percent, driven by significant gains in social inclusion at 5.18 percent. However, its progress in efficient and sustainable resource use and green economic opportunities was modest.
In contrast, Western Africa, which followed with an Index growth of 1.83 percent, outperformed Eastern Africa in green economic opportunities with a 2.61 percent increase, showcasing a stronger transition to a green economy.
Middle Africa recorded a 1.32 percent increase, marked by the most substantial growth in natural capital protection at 3.37 percent among African subregions. However, its efficient and sustainable resource use score declined by -0.57 percent, limiting its overall green growth progress compared to Eastern and Western Africa. Southern Africa experienced minimal improvement at 0.37 percent, driven by declines in both the efficient and sustainable resource use and green economic opportunities dimensions. Despite these declines, its 5.78 percent rise in social inclusion highlighted significant social progress comparable to Eastern Africa. Meanwhile, Northern Africa experienced the most substantial decline in the Green Growth Index at -1.19 percent, primarily due to a sharp drop in green economic opportunities (-5.64 percent) and a minimal decrease in efficient and sustainable resource use. However, Northern Africa achieved the highest social inclusion improvement in the region at 5.92 percent, surpassing Eastern and Southern Africa in this dimension.

3.1.2 The Americas

The Americas has four subregions – the Caribbean, Central America, Northern America, and South America. Figure10 highlights notable variations in the Green Growth Index and its dimensions, providing a comparative perspective across the American subregions:

With an Index score of 53.88, the **Caribbean** performs moderately in natural capital protection at 63.32 and social inclusion at 65.82. However, it struggles with green economic opportunities, scoring 42.42, although it is the second highest in the Americas after Northern America. Compared to Northern America, the best-performing subregion, the Caribbean's social inclusion score is 22.56 points lower, highlighting significant welfare and equity gaps.

Scoring 57.31 on the Green Growth Index, **Central America** excels in natural capital protection at 70.89, the highest score among all American subregions. Its social inclusion score of 68.67 is solid but lags behind Northern America by 19.71 points. Central America's green economic opportunities score of 40.35, the lowest in the region, contrasts sharply with Northern America's score in this dimension of 49.88, revealing significant disparities in fostering green economic development.

As the highest-performing subregion with an Index score of 61.80, **Northern America** stands out in social inclusion at 88.38, which is not only the best in the Americas but also a benchmark globally. However, its natural capital protection score of 56.79 is the lowest among all American subregions, trailing South America's score of 68.05 by 11.26 points, reflecting challenges in biodiversity conservation and environmental protection.

With an Index score of 58.44, **South America** performs well in social inclusion at 74.74 and natural capital protection at 68.05. However, it struggles in green economic opportunities with a score of 41.13, only slightly higher than Central America's GEO score of 40.35. South America's social inclusion score lags behind that of Northern America, the top-scoring dimension in the Americas, by 13.64 points, illustrating disparities in access to social services and welfare systems.

The percentage change in scores between 2010 and 2023 for American subregions highlights notable variations in performance, with significant differences across regions (Figure 11). Northern America recorded the highest improvement in the Green Growth Index at 2.22 percent,

Figure 10. Green Growth Index and dimension subindices in the American subregions, 2023

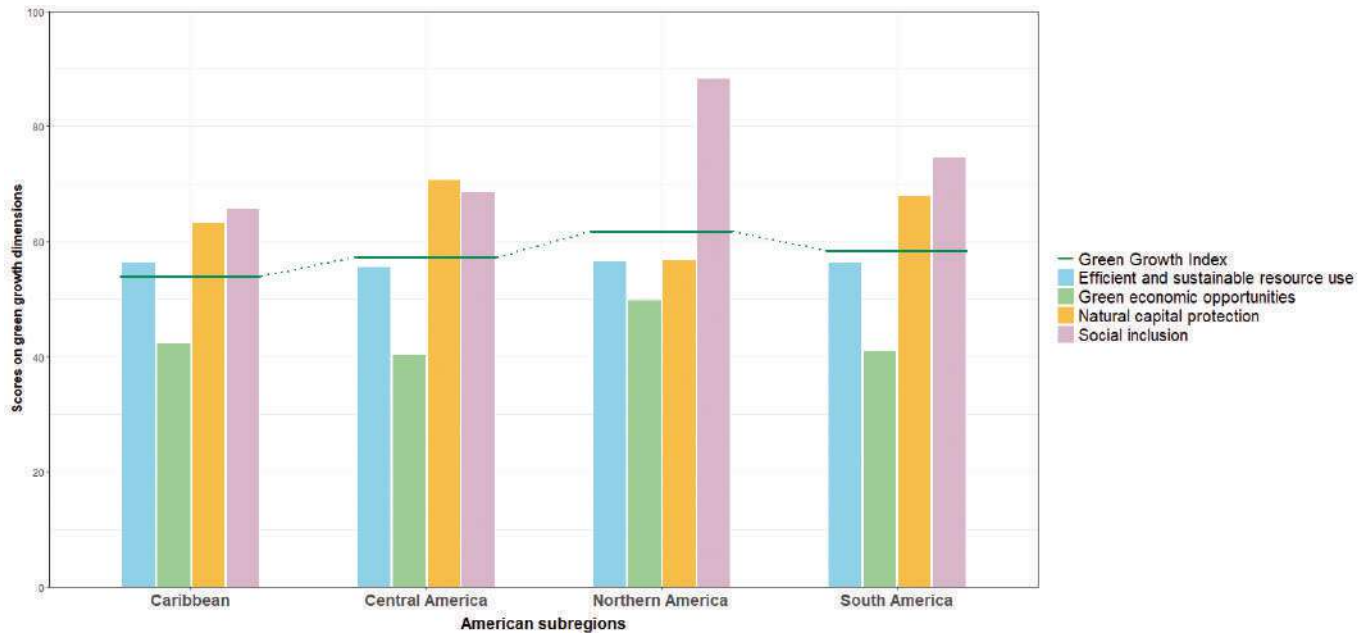
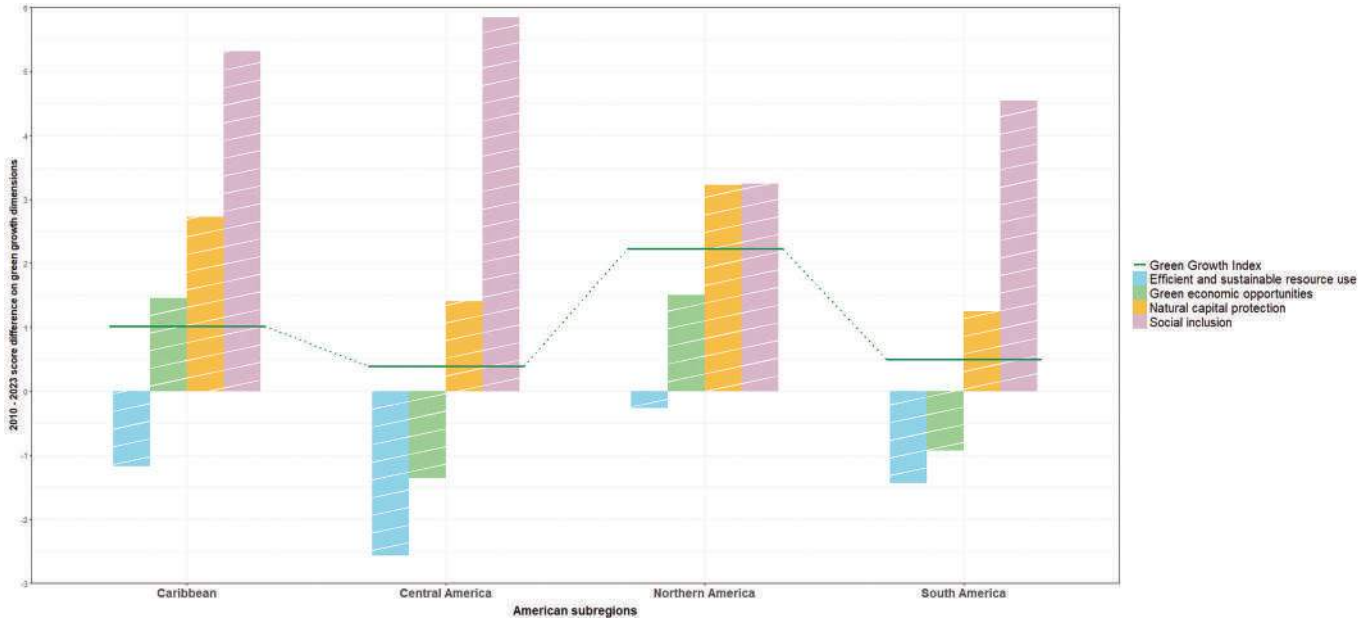


Figure 11. Score difference for the Green Growth Index and dimension subindices in the American subregions, 2010-2023



supported by the most substantial growth in natural capital protection at 3.23 percent, demonstrating its leadership in biodiversity and ecosystem conservation. However, its efficient and sustainable resource use performance showed a slight decline, a trend less severe than Central America's sharp drop of -2.57 percent, the region's most significant decrease in this dimension. The Caribbean achieved an Index growth of 1.01 percent, driven by a 5.31 percent increase in social inclusion, the second-highest growth in this dimension after Central America. Despite this, the decline in the Caribbean's efficient and sustainable resource use of -1.17 percent was more moderate compared to South America and Central America, highlighting some resilience in resource management. South America recorded a modest 0.50 percent increase in the Green Growth Index score, supported by a 4.54 percent rise in social inclusion, showing improvement in social equity. However, it struggled in other dimensions, with green economic opportunities declining by -0.93 percent and efficient and sustainable resource use dropping by -1.43 percent, reflecting stagnation in the green economy and resource-efficiency transitions. In contrast, Central America experienced the smallest Index growth at 0.39 percent. Still, it achieved the highest social inclusion growth in the region at 5.84 percent, indicating significant progress in equity and access to services. This was overshadowed by steep declines in the dimensions of efficient and sustainable resource use and green economic opportunities, limiting overall performance improvement.

3.1.3 Asia

The subregions of Asia include Central, Eastern, South-eastern, Southern, and Western. Figure 12 reveals that the performance of Asian subregions in the Green

Figure 12. Green Growth Index and dimension subindices in the Asian subregions, 2023

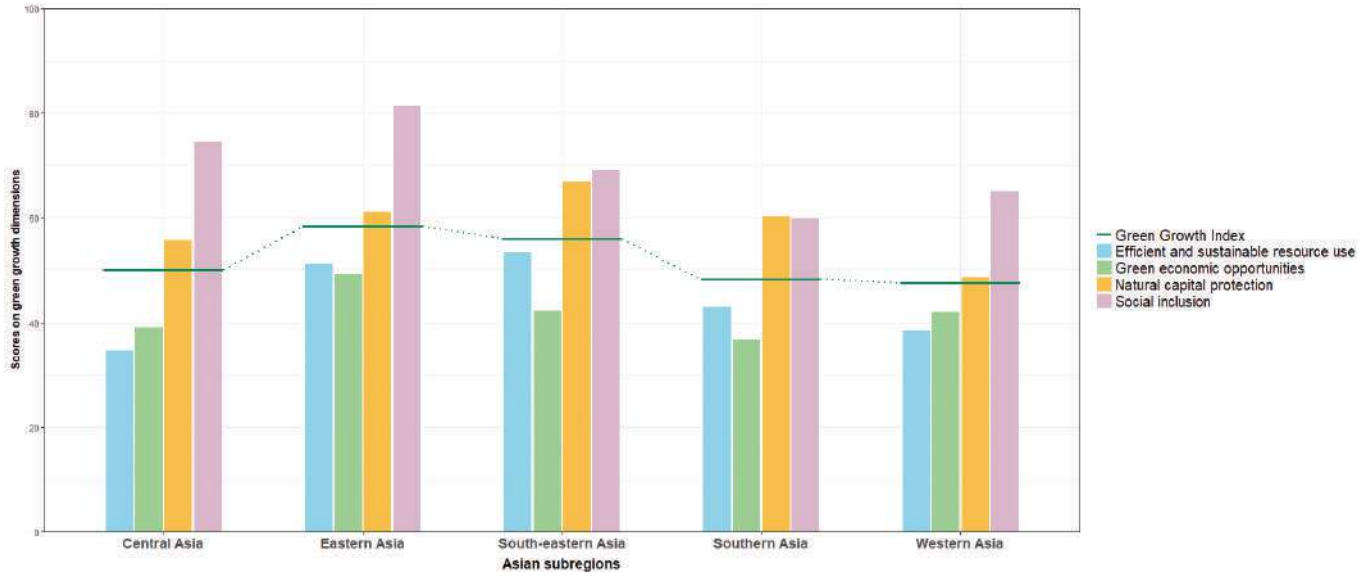
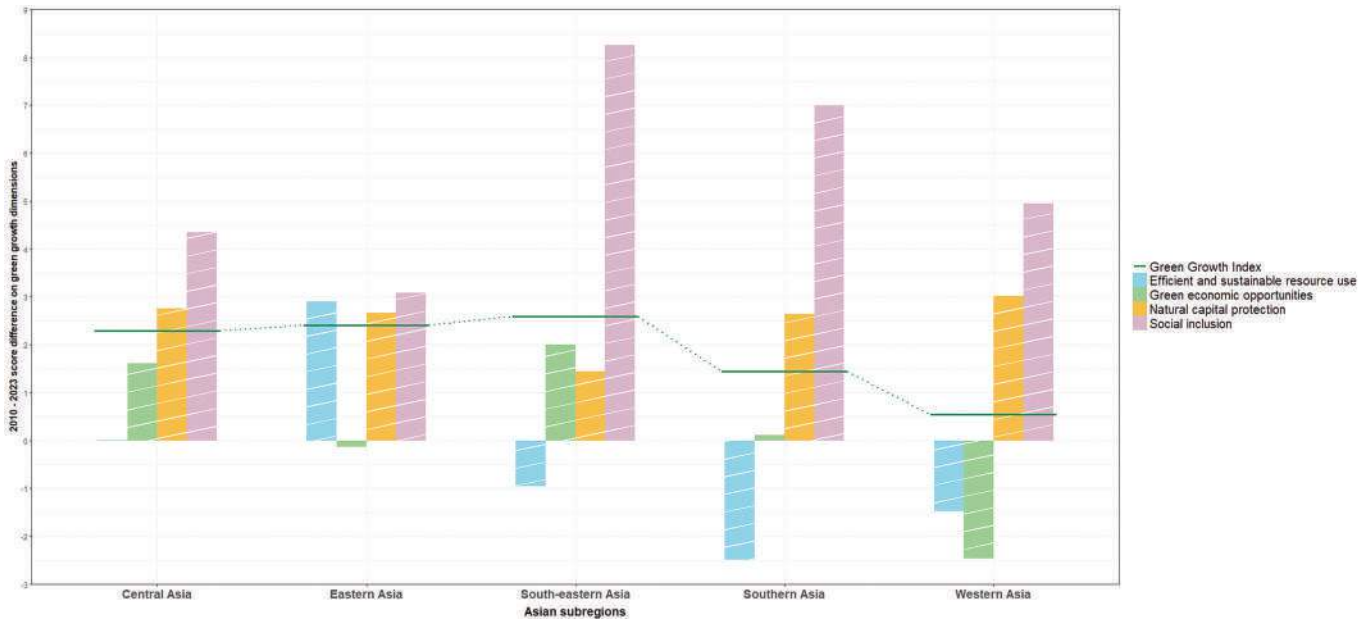


Figure 13. Score difference for the Green Growth Index and dimension subindices in the Asian subregions, 2010-2023



Growth Index demonstrates a diverse range of strengths and weaknesses across the four dimensions:

- With an Index score of 50.11, **Central Asia** struggles in efficient and sustainable resource use, scoring the lowest in the region at 34.77. However, it performs well in social inclusion, achieving 74.61, the second highest in Asia. Compared to Eastern Asia, which scores highest in efficient and sustainable resource use at 51.29, Central Asia's performance highlights critical limitations in resource use.

- **Eastern Asia** leads the region with an Index score of 58.34, driven by strong social inclusion at 81.55, the highest score in the region. Its efficient and sustainable resource use performance is also notable, scoring 51.29. However, despite its overall leadership, its performance in green economic opportunities is moderate at 49.39, compared to Central Asia's lowest score of 39.18.

- Scoring 56.03 on the Index, **South-Eastern Asia** performs well in natural capital protection, with the highest score in Asia at 67.15. Its performance in social inclusion is high at 69.23 but still slightly trails Central Asia. In contrast, its green economic opportunities performance remains limited, with a score of 42.37, similar to Western Asia's score of 42.20.

- With an Index score of 48.24, **Southern Asia** faces challenges in green economic opportunities and efficient and sustainable resource use, scoring 36.88 and 43.11, respectively. It performs moderately well in natural capital protection, achieving 60.47, but falls behind Eastern and South-Eastern Asia in overall green growth transition efforts.

- **Western Asia** scores the lowest on the Green Growth Index at 47.54. It underperforms in efficient and sustainable resource use at 38.48 and natural capital protection at 48.86. However, its social inclusion performance is stronger at 65.14, indicating some progress in equitable development.

The percentage change in scores between 2010 and 2023 for Asian subregions reveals notable disparities in performance across dimensions (Figure 13). The percentage change in scores between 2010 and 2023 for Asian subregions reveals notable disparities in performance across dimensions (Figure 13). South-Eastern Asia recorded the highest improvement in the Green Growth Index at 2.59 percent, driven by a remarkable 8.25 percent increase in social inclusion, the largest in the region. Despite this, it faced challenges in efficient and sustainable resource use, which declined by -0.96 percent, the second-largest drop in this dimension, and modest growth in natural capital protection at 1.45 percent. Eastern Asia followed closely with an Index growth of 2.40 percent, marked by the most substantial rise in efficient and sustainable resource use at 2.90 percent among all subregions. However, green economic opportunities slightly declined, and social inclusion grew modestly, reflecting slower progress in socio-economic development. Central Asia demonstrated balanced improvements, achieving a 2.29 percent increase in the Index score. It recorded steady gains in natural capital protection (2.75 percent), green economic opportunities (1.61 percent), and social inclusion (4.35 percent) while maintaining stability in efficient and sustainable resource use with minimal growth. Southern Asia saw a modest Index growth of 1.44 percent, underpinned by a 6.99 percent rise in social inclusion and a 2.64 percent increase in natural capital protection. However, it faced the steepest decline in efficient and sustainable resource use (-2.49 percent) among all subregions, coupled with a slight drop in green economic opportunities. Western Asia experienced the most negligible improvement in the Index, rising by just 0.55 percent. While natural capital protection grew by 3.02 percent, the highest among Asian subregions, efficient and sustainable resource use and green economic opportunities showed notable declines of -1.48 percent and -2.47 percent, respectively, the most substantial regional drops in these dimensions. Although social inclusion increased by 4.95 percent, the overall performance underscores the need for comprehensive efforts to address weaknesses in sustainability and economic opportunities.

3.1.3 Europe

Europe's Eastern, Northern, Southern, and Western subregions scored highest on the Green Growth Index. Figure 14 presents the performance of European subregions, reflecting diverse strengths and areas for improvement across the four dimensions:

- **Eastern Europe** scores 65.69 on the Green Growth Index, with natural capital protection score significantly contributing to this performance at 76.70, the highest among European subregions. However, among the four dimensions, it performs best in social inclusion, scoring 85.95. However, the green economic opportunities dimension is a key challenge, with a score of 45.68, one of the lowest in the region. Comparatively, Northern Europe outperforms Eastern Europe in green economic opportunities, scoring 46.30.

- **Northern Europe** performs second best in the region with an Index score of 67.56, driven by one of Europe's highest social inclusion scores at 93.07 and strong performance in efficient and sustainable resource use at 68.80. While Northern Europe excels in most dimensions, its natural capital protection score of 71.23 significantly lags behind Eastern and Southern Europe, which score above 76.

- With an Index score of 62.52, **Southern Europe** excels in natural capital protection at 76.16, but green economic opportunities are a significant challenge, scoring the lowest in Europe at 40.27. Its performance in social inclusion is commendable, reaching 86.29, although it lags behind Northern and Western Europe.

- **Western Europe** achieves the highest Green Growth Index score of 70.80, supported by strong performance in efficient and sustainable resource use at 68.76 and social

inclusion at 94.14, the highest in Europe. Its performance in natural capital protection is robust at 72.92 but does not match the scores of Eastern and Southern Europe. Western Europe leads in green economic opportunities with a score of 50.10, highlighting its efforts to transition to a green economy.

The percentage change in scores between 2010 and 2023 for European subregions reveals generally positive trends across key sustainability dimensions, though growth rates varied (Figure 15). Western Europe led with a 3.08 percent overall improvement in the Green Growth Index, driven by the highest increase in efficient and sustainable resource use at 6.59 percent among subregions. However, challenges in green economic opportunities persisted, with a slight decline of -0.23 percent. This stands in contrast to Northern Europe, which followed with a 2.70 percent increase in Index score, supported by substantial gains in efficient and sustainable resource use at 3.81 percent and moderate progress in green economic opportunities. Despite these advancements, Northern Europe lagged significantly in social inclusion, with only a 2.40 percent increase, the smallest gain among all subregions, highlighting challenges in social development compared to Southern and Eastern Europe. Southern Europe recorded a 2.53 percent increase in its Index, driven by the highest growth in natural capital protection at 3.65 percent

Figure 14. Green Growth Index and dimension subindices in the European subregions, 2023

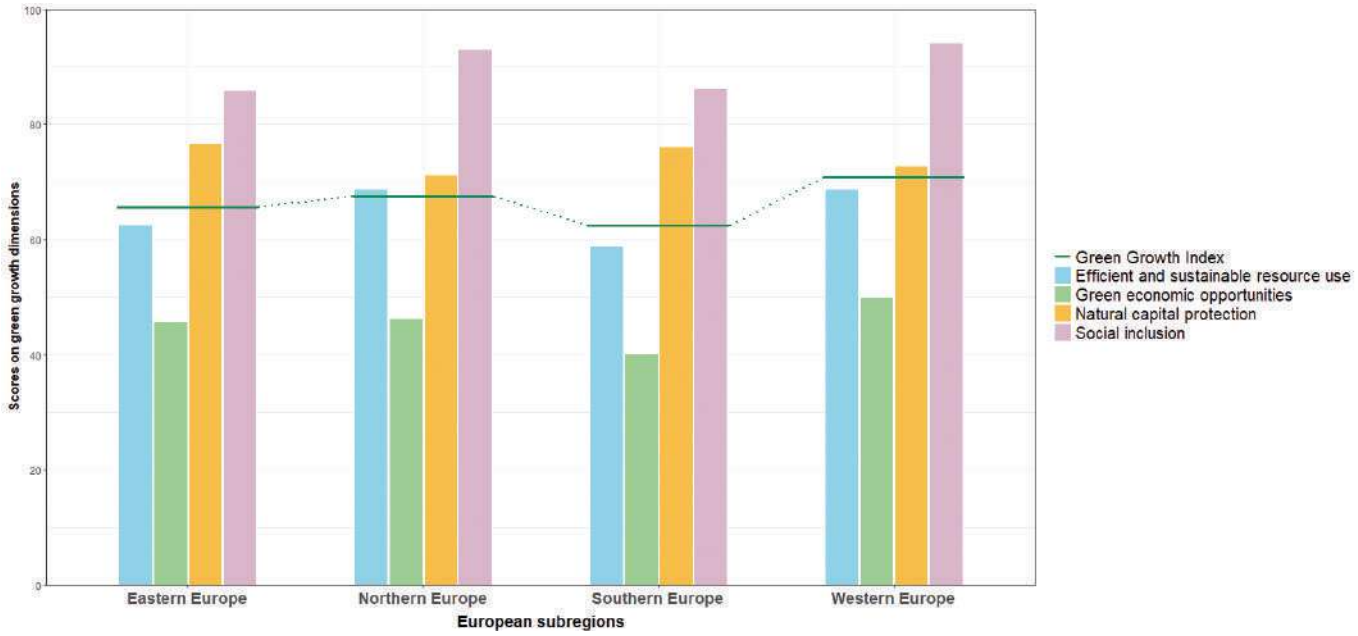
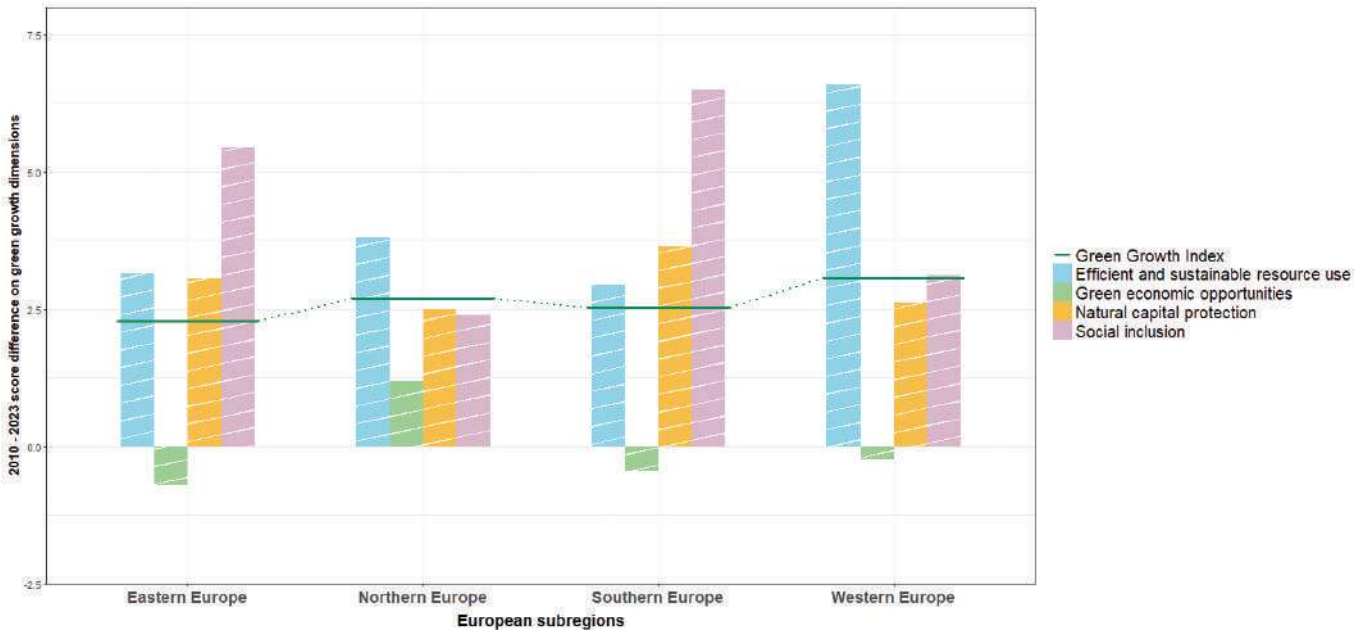


Figure 15. Score difference for the Green Growth Index and dimension subindices in the European subregions, 2010-2023



among subregions. It also achieved the most significant rise in social inclusion at 6.50 percent, underscoring its strong focus on equitable access and social services. However, Southern Europe's green economic opportunities declined by -0.44 percent, yet performed better than Eastern Europe. Eastern Europe experienced the most negligible overall Index improvement at 2.29 percent, supported by a moderate 3.14 percent gain in efficient and sustainable resource use and a 5.45 percent increase in social inclusion. Despite these gains, it faced the steepest decline in green economic opportunities at -0.69 percent, highlighting its struggle to advance green economic initiatives.

3.1.4 Oceania

Oceania has four subregions – Australia and New Zealand, Melanesia, Micronesia, and Polynesia. It is important to note that due to the data availability of Oceanian subregions, their comparison is limited in green economic opportunities, especially on green investment, green jobs, and green innovation (Figure 7). The performance of Oceania subregions in the 2024 Green Growth Index reveals notable disparities across the dimensions (Figure 16), with clear areas of strength and weakness across subregions:

Figure 16. Green Growth Index and dimension subindices in the Oceania subregions, 2023

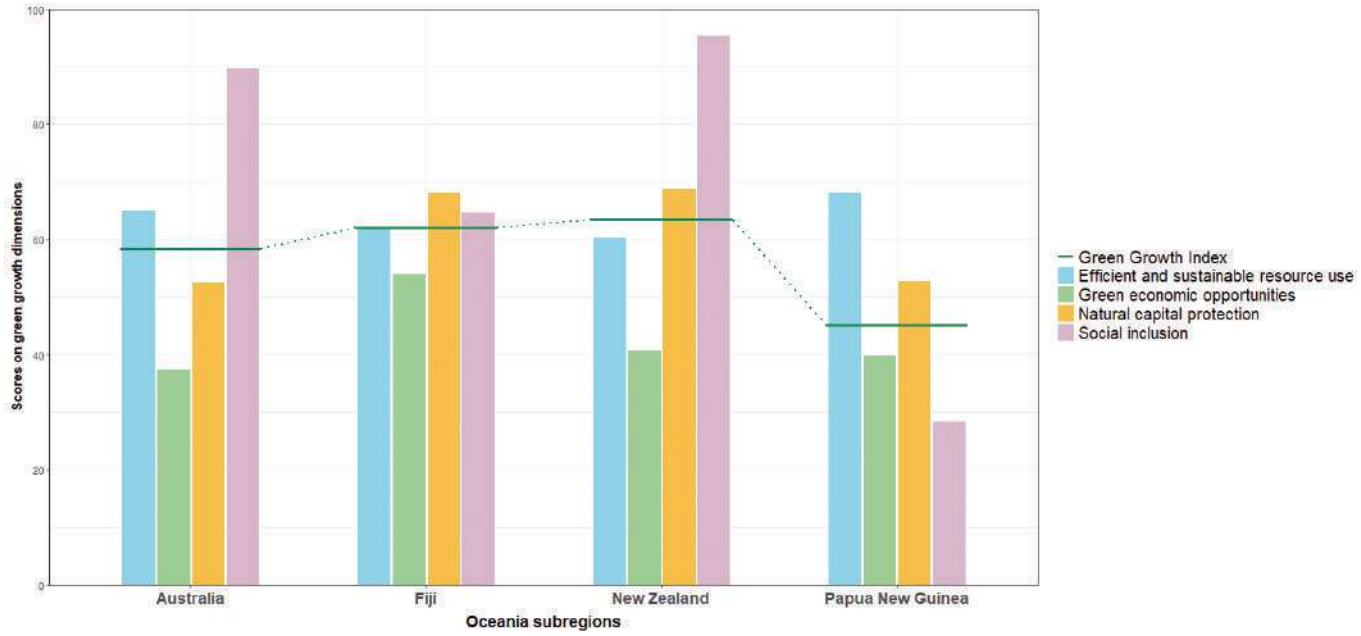
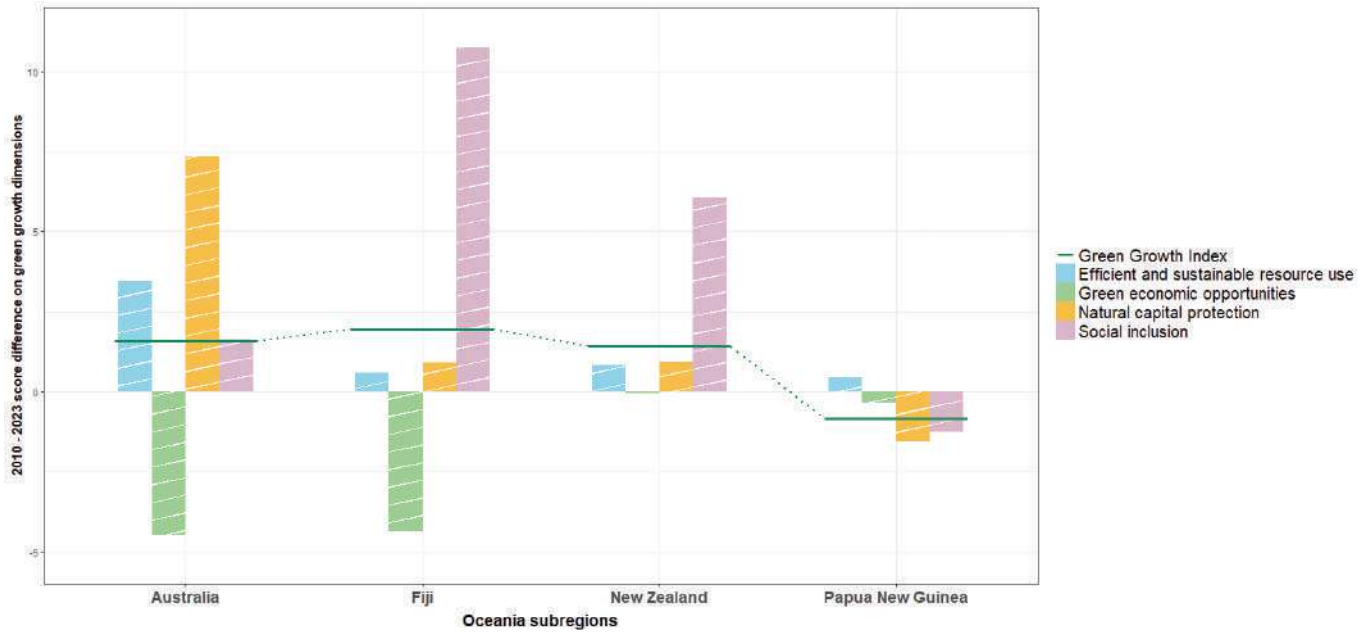


Figure 17. Score difference for the Green Growth Index and dimension subindices in the Oceania subregions, 2010-2023



With an Index score of 58.38, **Australia** performs well in efficient and sustainable resource use at 65.27, driven by its emphasis on sustainable land use. However, its green economic opportunities score of 37.56 highlights significant room for improvement, particularly when compared to Fiji, the best-performing Melanesian country in green economic opportunities with a score of 54.06. Australia's social inclusion score of 89.94 is second only to New Zealand's regional high of 95.54, reflecting robust welfare systems. Despite these strengths, its natural capital protection score of 52.66 is low compared to Fiji's 68.18 and New Zealand's regional best of 68.99. This points to Australia's challenges in biodiversity conservation and ecosystem management.

Fiji achieves an Index score of 62.02, excelling in natural capital protection with a score of 68.18, second only to New Zealand's 68.99. Fiji also performs well in green economic opportunities at 54.06, leading the region in this dimension and surpassing Papua New Guinea's regional low of 39.94. However, its social inclusion score of 64.77 is significantly lower than Australia's 89.94 and New Zealand's 95.54, indicating that progress is needed in equitable access to resources and inclusive policies.

Leading Oceania with an Index score of 63.48, **New Zealand** excels in natural capital protection at 68.99, the highest in the region. It also demonstrates the strongest performance in social inclusion with a score of 95.54, surpassing Papua New Guinea's regional low of 28.61. Its green economic opportunities score of 40.80 highlights a gap in promoting innovation and green trade, lagging significantly behind Fiji's regional high of 54.06. However, Fiji's balanced performance across dimensions sets a benchmark for New Zealand and other countries in the region.

Scoring 45.08 on the Index, **Papua New Guinea** faces challenges across most dimensions. While it leads the region in efficient and sustainable resource use with a score of 68.26, it scores the lowest in social inclusion at 28.61, showcasing severe inequities and lack of access to basic services compared to New Zealand's regional high of 95.54. Additionally, its scores in natural capital protection at 52.96 and green economic opportunities at 39.94 reflect significant areas for improvement, particularly in comparison to the strengths seen in New Zealand and Fiji.

The percentage change in scores between 2010 and 2023 for Oceania countries highlights diverse performances, with notable contrasts across dimensions (Figure 17). Fiji achieved the highest Index improvement at 1.94 percent, driven by a significant 10.75 percent increase in social inclusion, the largest gain in the region. However, this progress was offset by the steepest decline in green economic opportunities at -4.38 percent, revealing challenges in fostering a green economy. In comparison, Australia followed with an Index growth of 1.59 percent, supported by the strongest rise in natural capital protection at 7.34 percent and a solid 3.46 percent increase in efficient and sustainable resource use. Despite its leadership in environmental dimensions, Australia experienced the most significant drop in green economic opportunities at -4.46 percent, underscoring persistent economic challenges like Fiji. New Zealand recorded an Index increase of 1.44 percent, showcasing balanced but moderate progress across dimensions. Its green economic opportunities performance remained relatively stable, with a slight decline of -0.04 percent, while social inclusion grew by 6.05 percent, reflecting substantial social improvements. However, its gains in efficient and sustainable resource use and natural capital protection were modest compared to Australia. In stark contrast, Papua New Guinea experienced a decline of -0.84 percent in its Index score, the weakest performance in the region. It faced reductions in natural capital protection (-1.57 percent) and social inclusion (-1.24 percent), alongside marginal growth in efficient and sustainable resource use at 0.43 percent. Its green economic opportunities performance also declined by -0.35 percent.

3.2 Regional trend

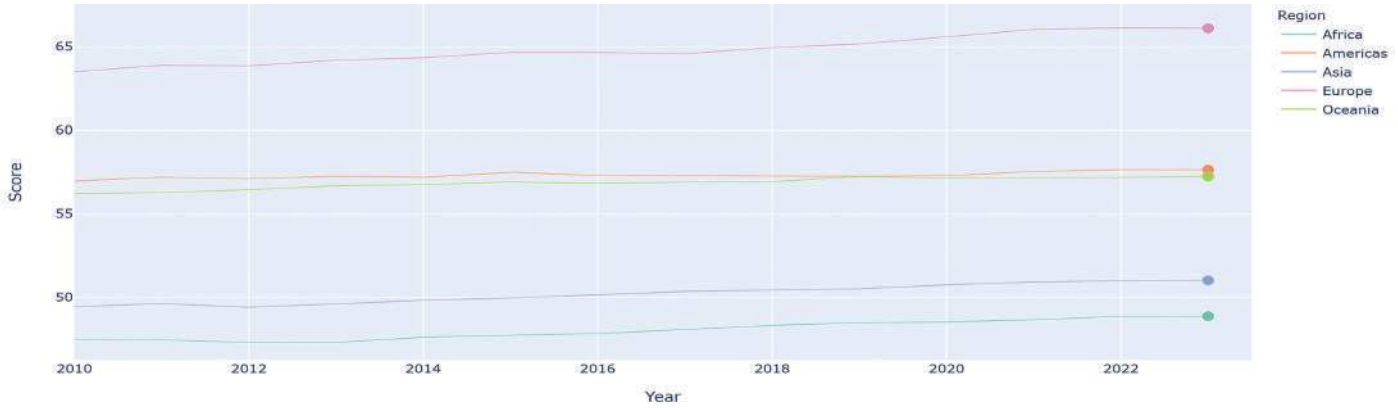
3.2.1 Green Growth Index Trend

Figure 18 illustrates the Green Growth Index trends for five regions—Africa, the Americas, Asia, Europe, and Oceania—from 2010 to 2023. The trends reveal diverse trajectories, offering insights into each region's progress or stagnation in fostering green growth. By understanding these dynamics, this analysis provides a comprehensive overview of regional achievements, challenges, and opportunities for advancing green growth transition.

Figure 18 presents the Green Growth Index trend analysis for the five regions, i.e., Africa, the Americas, Asia, Europe, and Oceania, from 2010 to 2023. The trends inform about the progress in fostering green growth transition, showing the dimensions facing challenges and creating opportunities for the regions.

Europe was the top-performing region from 2010 to 2023, with its Green Growth Index scores increasing from 63.51 in 2010 to about 66 towards the end of 2023, a 2.6-point performance improvement in over a decade. This reflects the region's effective governance and significant investment in sustainable development. The region maintains its leadership in green growth, attributed to ambitious policy frameworks such as the European Green Deal, promoting

Figure 18. Trend in Green Growth Index by region, 2010-2023



climate neutrality, circular economy initiatives, and biodiversity conservation[37]. **The Americas**' Green Growth Index scores are about 10 points lower than Europe and at par with Oceania. The region experienced a relatively stable trend, starting at 56.97 in 2010 and improving slightly to 57.65 in 2023. The slight performance improvements can be attributed to renewable energy use in North America and environmental conservation initiatives in Central and South America. Promoting global trade agreements and implementing renewable energy policies in the United States and Canada also contributed to moderate green growth.[38] Nonetheless, challenges persist in aligning economic opportunities with green policies.[39] Together with the Americas, **Oceania** takes the middle ranks in green growth performance. It maintained almost constant performance, with its Green Growth Index scores increasing negligibly from 56.21 in 2010 to 57.24 in 2023. Progress is driven by Australia and New Zealand's leadership in renewable energy strategies, while smaller island nations face structural barriers such as limited capacity and reliance on natural resources.[40] Biodiversity and water efficiency challenges persist, particularly in Melanesia and Polynesia, impeding accelerated regional green growth performance.[41] Limited data availability also affects regional evaluations. **Asia**'s Green Growth Index scores are about six points lower than those of the Americas and Oceania. The region experienced negligible but steady growth, with scores slightly improving from 49.45 in 2010 to 51.02 in 2023. Using renewable energy and reducing pollution in Eastern Asia improved the region's green growth performance. However, other countries continue to face resource management and social development challenges, hindering overall improvement.[42] The green growth trends are influenced by the region's socio-economic contexts, with developed countries advancing faster than developing countries. Together with Asia, **Africa** occupies the lower ranks in green growth performance. Africa's Green Growth scores increased minimally from 47.5 in 2010 to 48.88 in 2023. These are about two points lower than Asia's, making it the lowest-performing region globally. Issues such as lack of modern infrastructure, insufficient renewable investments, and unstable political situation hinder green growth progress. The African Green Growth Strategy aims to overcome these barriers through green infrastructure and technology[43] and by promoting international collaboration[44]. Improving social equity offers opportunities for accelerating green growth in the region.

The Green Growth Index trends from 2010 to 2023 highlight significant regional disparities in advancing green growth. Implementing targeted strategies and critical investments contributes to Europe's consistent green growth leadership. Promoting renewable energy and environmental conservation supports the moderate performances of the Americas and Oceania. Socio-economic disparities and structural barriers challenge Asia and Africa's green growth performance.

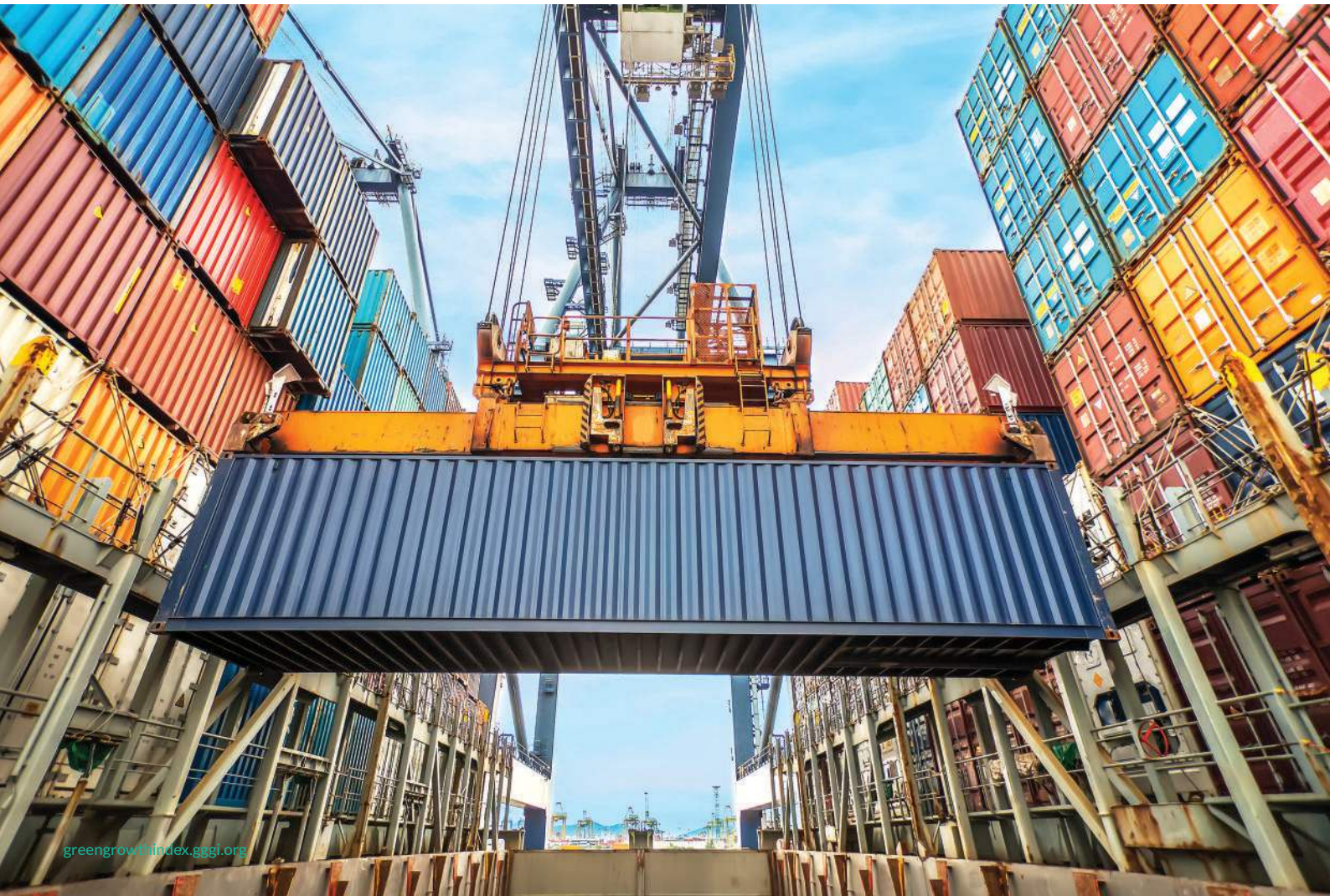
3.2.2 Trend in dimensions

The analysis of green growth performance from 2010 to 2023 across five global regions—Africa, the Americas, Asia, Europe, and Oceania—reveals varied trends due to their distinct socio-economic, environmental, and policy contexts. While some regions achieved remarkable progress in specific green growth dimensions, others faced persistent challenges linked to limited investment, weak governance, and climate vulnerabilities. On the one hand, social inclusion and natural capital protection emerged as strong dimensions in developed regions like Europe and the Americas, benefiting from significant investments in social welfare and environmental sustainability. On the other hand, efficient and sustainable resource use and green economic opportunities lagged in many developing regions due to resource-intensive industries, poor infrastructure, and limited technological adoption. Specifically, Oceania and Africa experienced slower progress due to fragmented governance, environmental degradation, and socio-economic disparities. Detailed green growth performance analysis for each region is presented below.

Africa

Figure 19 shows the trend in Africa's dimension scores for the four green growth dimensions from 2010 to 2023. Throughout this period, natural capital protection remained the best-performing dimension, and green economic opportunities were the least-performing in the region. **The natural capital protection** score was consistently above

59, increasing from 59.79 in 2010 to 61.25 in 2023 due to improved conservation policies, including reforestation and wildlife conservation, that protect biodiversity and reduce GHG emissions. However, key challenges remain, including deforestation in Africa's large forest areas, driven by agriculture, logging, and infrastructure development[45], land degradation, and biodiversity loss in protected areas due to poor management[46]. Northern Africa, scoring low in biodiversity and ecosystem protection at 26.61 in 2023 (Figure 7), is considered a hotspot where overgrazing, poor water management, and intensive farming degrade the land, threatening food security and livelihoods.[47] Africa's performance in **efficient and sustainable resource use** shows limited progress, with scores slightly declining from 56.82 in 2010 to 56.41 in 2023 due to challenges in resource management. Although sustainable land use and agricultural productivity improved,[48] significant challenges persist in Africa. These include severe water stress due to poor water infrastructure and limited transboundary water management agreements[49], inconsistent implementation of sustainable farming practices and inadequate irrigation systems[50], and lack of investment in the renewable sector[51]. Northern Africa performs the weakest in efficient and sustainable water use, scoring very low at 5.50 in 2023 (Figure 7). This is attributed to the subregion's substantial dependence on renewable water sources, such as underground aquifers for agricultural irrigation and industrial use.[52] Although not the best-performing dimension in the region, **social inclusion** showed the highest percentage increase, from 45.38 in 2010 to 49.88 in 2023. This positive trend was contributed by improved healthcare access, education, and gender equity initiatives.[53] Moreover, investments supported expanding educational infrastructure and healthcare services.[54] However, persistent barriers remain, such as poverty and social exclusion stemming from income inequality and unequal access to essential services[55], limited women's participation in education, the labor market, and political representation[56], and vulnerable people's restricted access to welfare programs like health insurance and pensions[57]. Middle Africa performs the weakest in social inclusion, with the lowest scores in access to basic services and resources, gender balance, social equity, and social protection in the region in 2023 (Figure 7). In many Middle African countries, corrupt government, business, and civil service practices create barriers to accessing education, healthcare, and economic opportunities.[58] Africa performs least in **green economic opportunities**, with scores increasing marginally from 33.68 in 2010 to 34.39 in 2023. The limited progress can be attributed to weak industrial diversification, inadequate innovation systems, and barriers to green technology adoption[59]. Due to policy gaps and infrastructure deficits, Africa's potential in green trade, sustainable industries, and eco-tourism remains underutilized.[60] Limited technological development further stifles innovation, while weak transport, energy, and ICT systems reduce the region's competitiveness in global green value chains.[61] Green innovation is lowest in Northern Africa, with a score of 14.69 in 2023 (Figure 7).



Africa's Green Growth Index trends from 2010 to 2023 show mixed progress across environmental conservation, social development, economic growth, and resource management. The region achieved progress in natural capital protection and social inclusion but faced challenges in creating green jobs, boosting trade, and managing essential resources like water and energy. Improving policy frameworks and implementation in efficient and sustainable resource and green economic opportunities will be key to accelerating the green growth transition.

The Americas

Figure 19 shows the trend in the Americas' dimension scores for the four green growth dimensions from 2010 to 2023. Social inclusion is the region's best-performing dimension, and green economic opportunities are the least-performing throughout this period. The Americas performed best in **social inclusion**, with scores increasing from 65.92 in 2010 to 70.97 in 2023 due to the region's progress in access to welfare programs, education, healthcare, and other social services. Northern America, particularly the United States and Canada, has accessible social welfare programs that provide extensive coverage for healthcare, unemployment benefits, and pensions.[62] Many American countries sufficiently invested in education, contributing to high enrollment rates and improved education equity.[63] Financial assistance and cultural programs are extended to vulnerable and indigenous communities to reduce poverty, improve social mobility and cultural diversity, and promote social equity.[64] The Americas pursued policies to enhance women's participation in the workforce, politics, and education.[65] However, progress in social inclusion needs to be made visible across the regions, particularly in less developing countries. After social inclusion, the Americas showed the best performance in **natural capital protection**, with scores improving from 63.61 in 2010 to 65.66 in 2023 due to concerted efforts in environmental conservation, sustainable resource management, and policy implementation across the region. For example, many Latin American countries are implementing sustainable land management practices related to agroforestry, watershed protection, biodiversity conservation, and sustainable livelihoods.[66] Advanced satellite technology and environmental monitoring systems track illegal activities in protected areas.[67] Regional cooperation in environmental policies is promoted to improve transboundary environmental governance.[68] However, the region's lowest scores in natural capital protection are recorded for GHG emissions reduction at 44.63 and biodiversity and ecosystem protection at 37.81 in North America (Figure 7). In the United States, forest management strategies are assessed to conflict with climate goals because actions aimed at reducing wildfire risks sometimes compromise biodiversity and ecosystem stability, contributing to habitat degradation and increased carbon emissions.[69] America's **efficient and sustainable resource use** performance lags behind social inclusion and natural capital protection. Moreover, unlike these dimensions, efficient and sustainable resource use scores decreased slightly from 57.75 in 2010 to 56.27 in 2023. The declining trend can be attributed to poor water and land management, underdeveloped energy infrastructure, and reliance on resource-intensive industries. For example, Central and South American countries face water scarcity due to inefficient water use, inadequate infrastructure, urbanization, and droughts.[70] Central America has the lowest efficient and sustainable water use score at 35.22 in 2023 (Figure 7). Renewable energy use is not advancing equally across the region, with a few countries in Latin and North America continuing to rely on non-renewable and inefficient energy sources.[71] Mining industries, fossil extraction, and intensive agriculture still dominate the region, contributing to inefficient and extractive resource use.[72] The **green economic opportunities** dimension is the least-performing dimension, and the region does not show performance improvement, with the scores declining slightly from 42.27 in 2010 to 41.76 in 2023. Although many American countries are shifting to renewable energy and sustainable trade agreements, scaling up green employment, innovation, and trade presents challenges. Limited research and development investments and inadequate incentives for innovative technologies and energy-efficient practices hinder progress in renewable energy use and industrial efficiency.[73] Reliance on extractive industries and monoculture agriculture discourages innovation in high-tech and green industries.[74] Inadequate energy, transport, and ICT infrastructure and a shortage of skilled labor and specialized education limit opportunities to develop and implement green technologies and products.[75] Green innovation performance is lowest in Central America, scoring 24.88 in 2023 (Figure 7).

From 2010 to 2023, Americans performed diversely across the four dimensions. Social inclusion is the best-performing dimension, supported by advancements in healthcare, education, and welfare systems in many American countries. The region also performed well in natural capital protection due to regional conservation and ecosystem management efforts. Due to reliance on resource extractive industries and intensive agriculture, declining performance trends were observed for efficient and sustainable resource use and green economic opportunities. A lack of investment, infrastructure, and skilled labor hampers innovations in renewable energy and green technologies.

Mining industries, fossil extraction, and intensive agriculture still dominate the region, contributing to inefficient and extractive resource use. The **green economic opportunities** dimension is the least-performing dimension, and the region does not show performance improvement, with the scores declining slightly from 42.27 in 2010 to 41.76 in 2023. Although many American countries are shifting to renewable energy and sustainable trade agreements, scaling up green employment, innovation, and trade presents challenges. Limited research and development investments and inadequate incentives for innovative technologies and energy-efficient practices hinder progress in renewable energy use and industrial efficiency. Reliance on extractive industries and monoculture agriculture discourages innovation in high-tech and green industries. Inadequate energy, transport, and ICT infrastructure and a shortage of skilled labor and specialized education limit opportunities to develop and implement green technologies and products.

From 2010 to 2023, Americans performed diversely across the four dimensions. Social inclusion is the best-performing dimension, supported by advancements in healthcare, education, and welfare systems in many American countries. The region also performed well in natural capital protection due to regional conservation and ecosystem management efforts. Due to reliance on resource extractive industries and intensive agriculture, declining performance trends were observed for efficient and sustainable resource use and green economic opportunities dimensions. A lack of investment, infrastructure, and skilled labor hampers innovations in renewable energy and green technologies.

Asia

Figure 19 shows Asia's performance trend in the four dimensions of green growth from 2010 to 2023, with social inclusion consistently performing best. The trends in efficient and sustainable resource use and green economic opportunities dimensions moved closely together, occupying the lowest position throughout this period. Asia saw growth in **social dimension** scores by 9.31 percent, increasing from 62.35 in 2010 to 68.15 in 2023 due to significant progress in expanding healthcare, education, and gender equity initiatives. Many East and Southeast Asian countries have invested in comprehensive education programs and healthcare infrastructure, allowing people to access and afford these basic services in urban and rural areas.[76] Marginalized communities were given access to social safety nets and welfare programs in developing countries, such as cash transfers and pensions in the Philippines, to reduce poverty.[77] Asian governments have also invested in programs to enhance gender participation in labor and education, such as Bangladesh's Rural Employment and Road Maintenance Program and Japan's Womenomics Initiative.[78] However, less developed South Asian countries continue to face inequalities in income and access to basic services.[79] Asia's **natural capital protection** also experienced growth, albeit not as high as in social inclusion performance, with 4.62 percent, increasing from 54.73 in 2010 to 57.26 in 2023. Efforts to rehabilitate degraded lands, improve ecosystem conservation, and reduce GHG emissions contributed to this positive trend. Reforestation programs in mangrove areas and tropical forests improved ecosystems in Southeast Asia's deforested and degraded agricultural areas.[80] Protected areas and wildlife conservation programs in the Himalayas and the Coral Triangle reduced biodiversity loss in Asia's rich biodiversity areas.[81] Implementing national climate strategies to meet Paris Climate Agreements helped reduce emissions and increase renewable energy in a few Asian countries.[82] However, rapid industrialization that relies on resource-intensive industries and urbanization without effective spatial planning hinders more significant progress in the region due to habitat destruction and increased pollution.[83] Moreover, arid countries in Western Asia suffer from soil erosion and desertification due to changing climate and overexploiting natural resources.[84] Together with Central Asia, Western Asia performed the weakest in biodiversity and ecosystem protection, scoring about 24 in 2023 (Figure 7). **Efficient and sustainable resource use** performance in Asia showed a declining trend, from 44.76 in 2010 to 43.84 in 2023, slightly higher than the decline in green economic opportunities. Although renewable energy use increased in some East Asian countries, many in the South and Southeast remained heavily dependent on fossil energy due to poor infrastructure and high investments.[85] Performance in water use efficiency in arid subregions like Western Asia is challenged by groundwater over-extraction, poor water infrastructure, and limited wastewater treatment facilities, contributing to water scarcity.[86] The efficient and sustainable water use score was one of the lowest in Western Asia at 17.76, with Central Asia scoring lower at 15.47 (Figure 7). Moreover, demand for construction materials and, thus, resource extraction increased across Asia due to rapid urbanization and limited recycling of waste materials.[87] Although implementing renewable energy and circular economy policies showed progress in Eastern countries,[88] these could not compensate for the lagging performance in other Asian countries. **Green economic opportunities** are Asia's lowest-performing dimension, and scores have remained stagnant for over a decade, declining slightly less than one percent from 41.77 in 2010 to 41.53 in 2023. The reasons for poor performance in this dimension are structural barriers, including limited diversification, barriers to trade, inadequate infrastructure, and institutional gaps. South and Western Asia depend on traditional industries with limited opportunities to diversify into green industries, creating new jobs.[89] Western Asia performed the lowest in green innovation at 26.39 in 2023 (Figure 7). While Eastern Asia progressed in green innovation, such as China and South Korea occupying large global markets for solar panels and electric vehicles[90], the rest struggled to develop and adopt green technologies due to limited investment and weak property rights[91]. The rigid regulatory frameworks, tariff structures, and weak transport and digital infrastructure hinder exports in renewable technologies and green exports.[92]

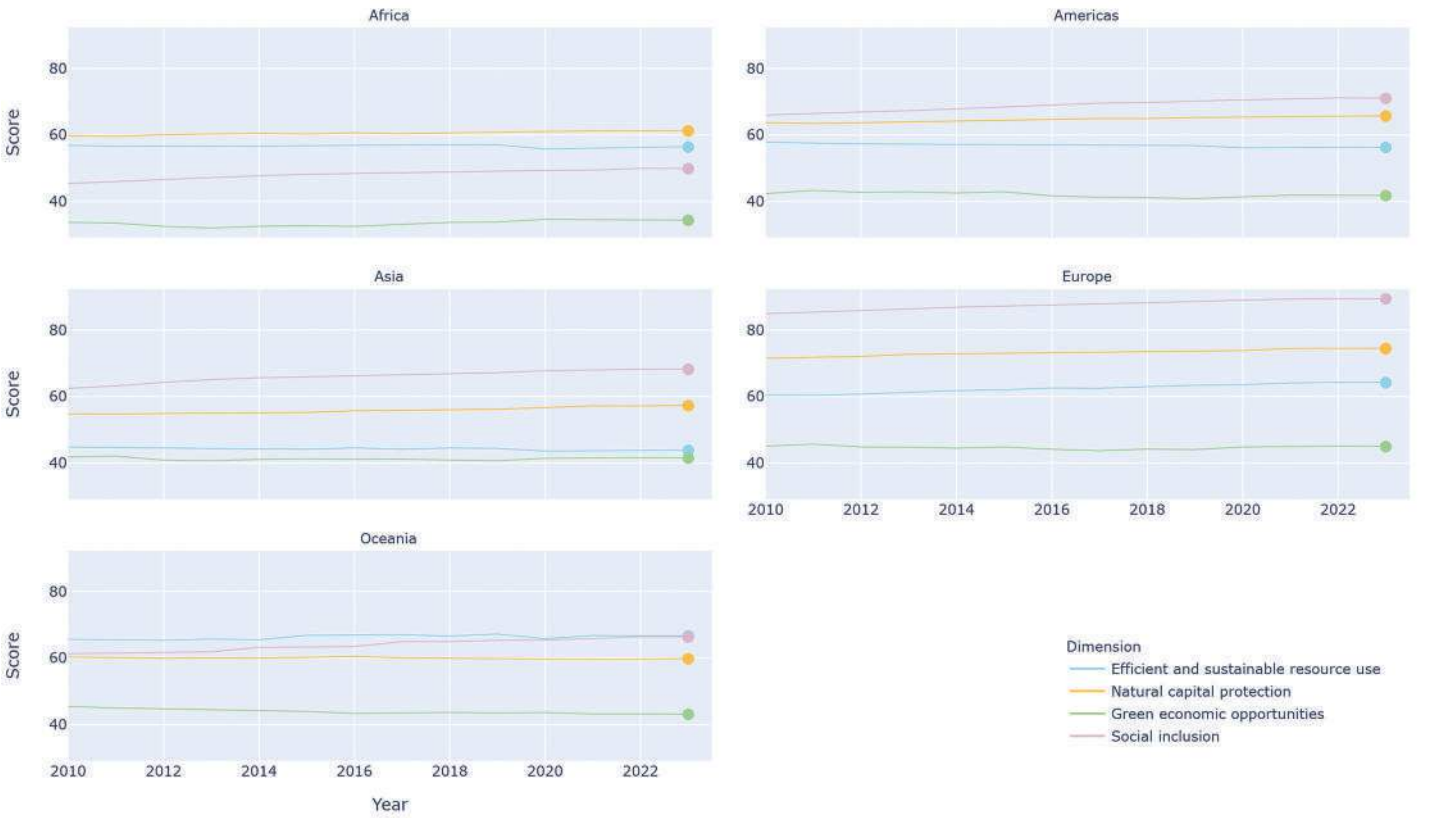
Disparities exist in the green growth performance across the four dimensions in Asia from 2010 to 2023. Social inclusion performs best due to comprehensive healthcare, education, and gender equity coverage, albeit mainly in East and Southeast Asia. The region also performs well in natural capital protection with improved conservation and reforestation initiatives. However, rapid urbanization and industrialization pose challenges to maintaining natural capital performance. Strong policy interventions to reduce fossil fuels, improve infrastructure, and enhance green technology uptake are necessary to improve efficient and sustainable resource use and green economic opportunities performance.

Europe

Figure 19 shows Europe's performance trend in the four dimensions of green growth from 2010 to 2023, with social inclusion consistently performing best and green economic opportunities performing least. **Social inclusion** scored very high, at 84.78 in 2010, and further increased to 89.35 in 2023, which can be attributed to significant investments (i.e., allocating a substantial share of GDP) and effective policies in education, healthcare, and social welfare, particularly

in the European Union (EU). For example, Sweden and Denmark provide universal access to basic services.[93] Policies promoting gender equity in employment, wage, and political representation are strong in Northern and Western Europe but lag in Eastern Europe.[94] Although economic inequalities and limited access to basic services continue to challenge many Eastern European countries, EU countries' strong social inclusion performance makes Europe the best-performing region globally. Europe performed second best in **natural capital protection**, with scores increasing slightly lower than social inclusion, at 4.2 percent, from 71.41 in 2010 to 74.42 in 2023. This trend can be attributed to the initiatives to reduce biodiversity loss, promote sustainable farm practices and eco-tourism, and implement reforestation and afforestation. However, performance varies across subregions, with Southern Europe facing more challenges than Northern and Western Europe. Intensive agricultural practices lead to extensive biodiversity loss and land degradation, with Southern Europe experiencing the highest soil erosion in the region.[95] In Eastern Europe, natural capital protection is challenged by a lack of modern agricultural practices, weak environmental policy implementation, and limited investment in ecosystem restoration.[96] While scoring lower than social inclusion and natural capital protection, Europe's **efficient and sustainable resource use** recorded the highest increase at 6.4 percent, from 60.28 in 2010 to 64.16 in 2023. Progress in renewable energy use contributed to this trend, with aggressive expansion in wind, solar, and geothermal energy aiming to reduce dependence on fossil fuels. In the EU, strict environmental regulations and increased policy incentives supported the adoption of cleaner technologies and resource-efficient practices.[97] Many EU countries also adopt waste-to-energy technologies and recycling systems, reducing solid waste.[98] Southern Europe's renewable energy transition is slower than Northern and Western Europe, with Greece and Italy progressing in solar energy use but continuing to rely significantly on fossil fuels.[99] However, fossil fuels significantly dominate the Eastern European economy, hindering the region's renewable energy transition.[100] Moreover, weak regulatory frameworks discourage private sector investment in renewable energy[101], and obsolete energy infrastructure impedes the adoption of cleaner and more efficient energy technologies[102]. Europe performs lowest in the **green economic opportunities dimension** and experiences a slightly declining trend, from 45.02 in 2010 to 44.97 in 2023. A 2019 study concluded that America remained an imitator in green economy development, Asia was transitioning toward innovation, and Europe was leading with advanced technology due to strategic industrial planning. [103] However, recently, Europe struggled to promote green innovation in key technologies like solar energy and electric vehicles, which countries like the United States and Eastern Asian countries dominate globally. While China supported electric vehicles through substantial government subsidies and a coordinated industrial strategy, Europe's declining subsidies and fragmented innovation ecosystems slowed down technology adoption.[104] China's assertive role in clean technology value chains challenges the EU's competitiveness in the global green technology market.[105]

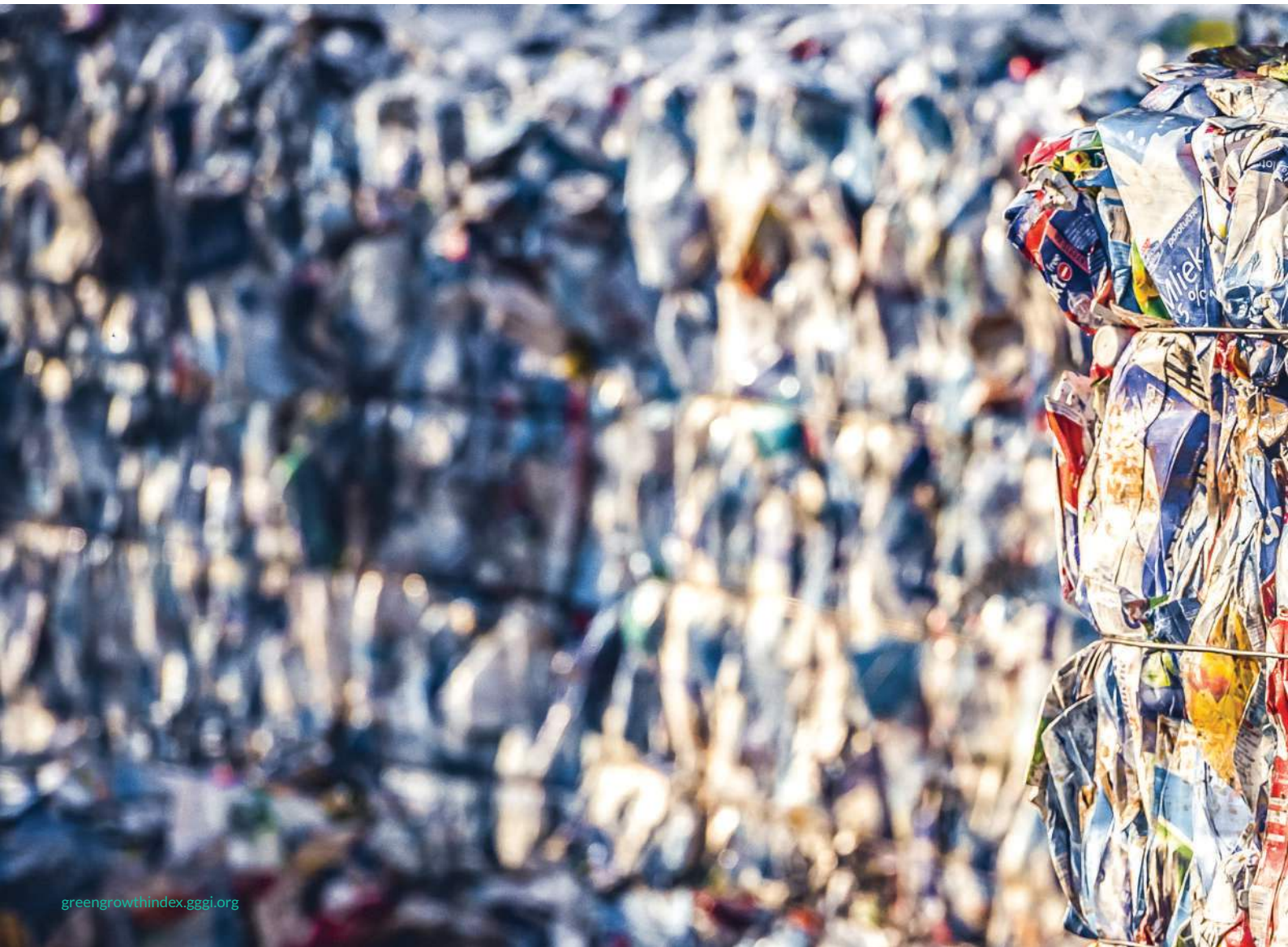
Figure 19. Trend in green growth dimensions by region, 2010-2023



EU countries showed very high green growth performance in the region from 2010 to 2023, particularly in social inclusion due to substantial investments in healthcare, education, and social welfare. Challenges in natural capital protection in Southern and Eastern Europe, including intensive agriculture and weak environmental policies, dwarf the positive impacts of biodiversity conservation, sustainable farming, and reforestation efforts in other parts of Europe. Recording the highest increase since 2010, efficient and sustainable resource use offers the region significant opportunities to improve green growth performance in the future. However, the remaining challenges in fossil fuel reliance and outdated infrastructure in Eastern Europe must be overcome. Green economic opportunities pose the most enormous challenge, with China's aggressive strategies in global green technology markets decreasing Europe's competitiveness.

Oceania

Figure 19 shows Oceania's performance trend in the four dimensions of green growth from 2010 to 2023. Two dimensions occupy the highest performance very closely—efficient and sustainable resource management and social inclusion. In 2020, **efficient and sustainable resource use** performed the highest among the four dimensions, scoring 65.56. However, the increase in score was not significant—1.64 percent, increasing to 67.15 in 2023. New Zealand leads the region in renewable energy adoption, with over 80 percent of its electricity generated from renewable sources, primarily hydropower, geothermal, and wind energy.[106] Australia continues to depend on fossil energy, although there are initiatives to promote renewable energy generation, including subsidies for solar power projects.[107] Pacific Island countries also continue to rely on imported fossil fuels due to high costs and poor infrastructure for modern, clean energy, hindering the development of a renewable energy sector.[108] Micronesia recorded the lowest efficient and sustainable resource use score at 33.86 in 2023 (Figure 7). Moreover, while Australia and New Zealand invested in modern irrigation techniques and promoted water conservation initiatives, most Pacific Island countries are challenged by water scarcity due to inadequate water management systems.[109] Oceania showed the highest growth in **social inclusion** by 8.4 percent, increasing to 66.33 and almost overtaking the efficient and sustainable resource use score in 2023. Australia and New Zealand are the main drivers of this trend, advancing social safety and gender equality and expanding access to education and healthcare. Since 2013, the Australian Government has invested in the Remote Schools Attendance Strategy to address education disparities and increase school participation rates in underserved



communities.[110] Although gender equality has improved in the Pacific Island countries due to the Pacific Women Shaping Pacific Development Program, isolated rural areas have limited access to social services.[111] Oceania's **natural capital protection** performance slightly declined from 60.22 in 2010 to 59.82 in 2023 due to increased deforestation and reduced biodiversity in the region's diverse ecosystems. Conservation policies are ineffective due to limited funding and weak governance, particularly in Melanesia and Polynesia.[112] Moreover, logging and mining as sources of local livelihoods challenge conservation efforts.[113] Climate change also causes habitat loss and ecosystem degradation due to extreme water events, sea level rise, and coral bleaching.[114] Coral bleaching challenges conservation efforts in Australia's Great Barrier Reef Marine Park, internationally recognized for its marine biodiversity.[115] Despite these climate change impacts, progress in reducing GHG emissions is lowest in Australia at 19.45 in 2023 (Chapter 9). Oceania's weakest dimension is **green economic opportunities**, with the lowest score of 45.4 in 2010, dropping further to 43.09 in 2023, representing a 5.1 percent decline in scores. Pacific Island countries rely on primary sectors such as agriculture and fishing, with limited opportunities for diversifying in green industries and technologies due to a lack of investment.[116] Economic and infrastructure vulnerability to extreme climate events reduces investor confidence in green industries.[117]

High transport and logistics costs in geographically isolated and small domestic markets in the Pacific Islands reduce competitiveness in global green trade.[118] New Zealand leads in green innovation, creating a dedicated green investment bank (Green Investment Finance Limited) to accelerate investment in development projects reducing GHG emissions, including transport, process heat, agriculture, etc.[119]

Oceania's green growth from 2010 to 2023 depicts a stagnant or declining performance, except for social inclusion, which increased by 8.4 percent. However, only Australia and New Zealand contributed to the positive regional trend of social inclusion, which was driven by investments in education, healthcare, and gender equality. Similarly, only these two countries showed improvements in renewable energy, with the rest of the region constrained by reliance on fossil fuels and limited energy infrastructure. Performance in natural capital protection and green economic opportunities declined, with the former challenged by deforestation, habitat loss, and weak conservation policies, and the latter struggled due to low investment, geographic isolation, and limited green industry development.

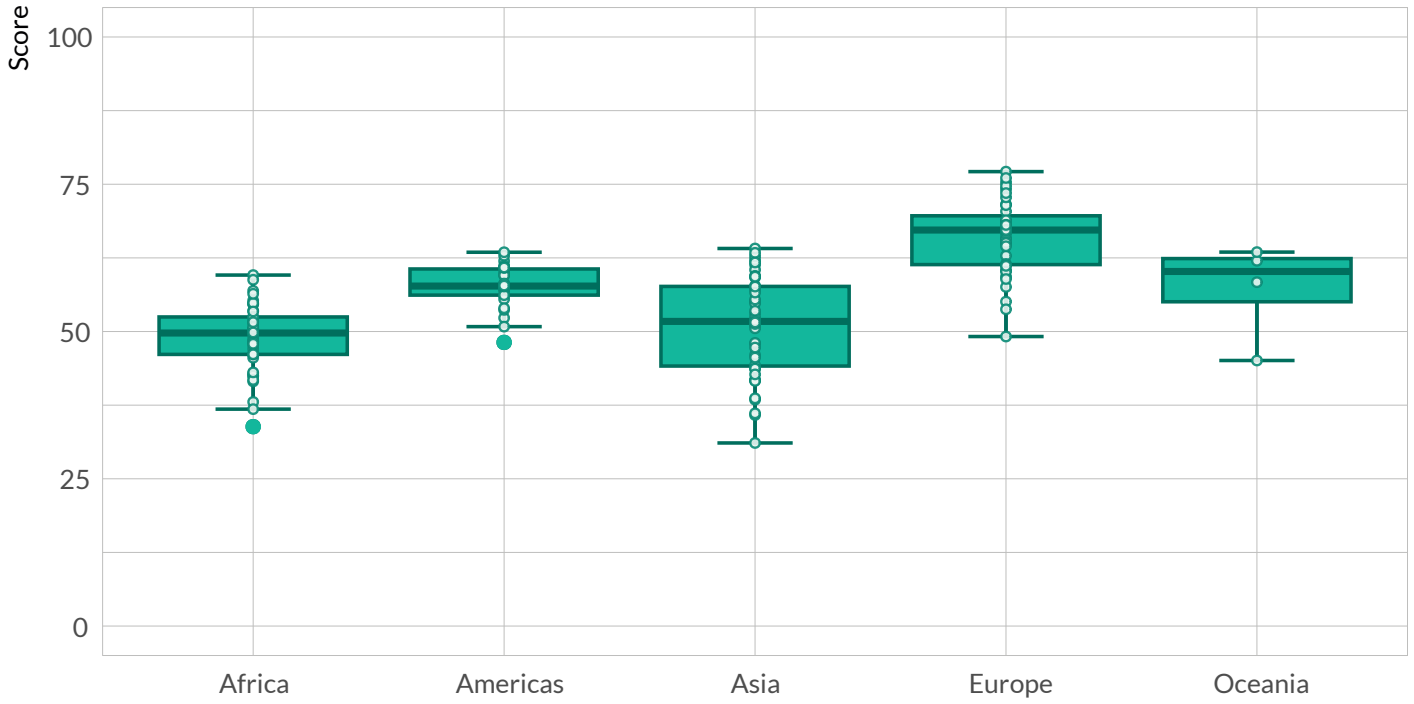
4 Country Performance

4.1 Country Distribution

The Green Growth Index scores of the countries by region are presented in the boxplot diagram in Figure 20. The scores for most European countries gather around the high range of scores, between 60 and 80, in 2023. This contrasts with the scores of African and Asian countries, whose scores gather around the moderate range, between 40 and 60. There were three African countries with scores below 40, including Niger, Sudan, and Libya. Compared with Africa, more countries in Asia had scores below 40. These Asian countries include Uzbekistan, Iraq, Pakistan, Bahrain, and Yemen. There are no African countries with scores above 60. In Asia, Japan and Laos were the countries that reached high scores, but also the countries of Georgia, China, Thailand, Bhutan, and Malaysia showed scores above 60. The scores for the Americas and Oceania countries tended to split above and below 60, corresponding to high and moderate performance, respectively. In Oceania, Papua New Guinea's score was farther from the other scores in the scatter diagram. Barbados was farthest from the other countries in the Americas. Nonetheless, these countries in Oceania and the Americas performed moderately, unlike many countries in Africa and Asia, which showed low performance. The visible outliers in Africa and the Americas are Libya, with a value of 33.85, and Barbados, but the latter has a higher score of 48.15.

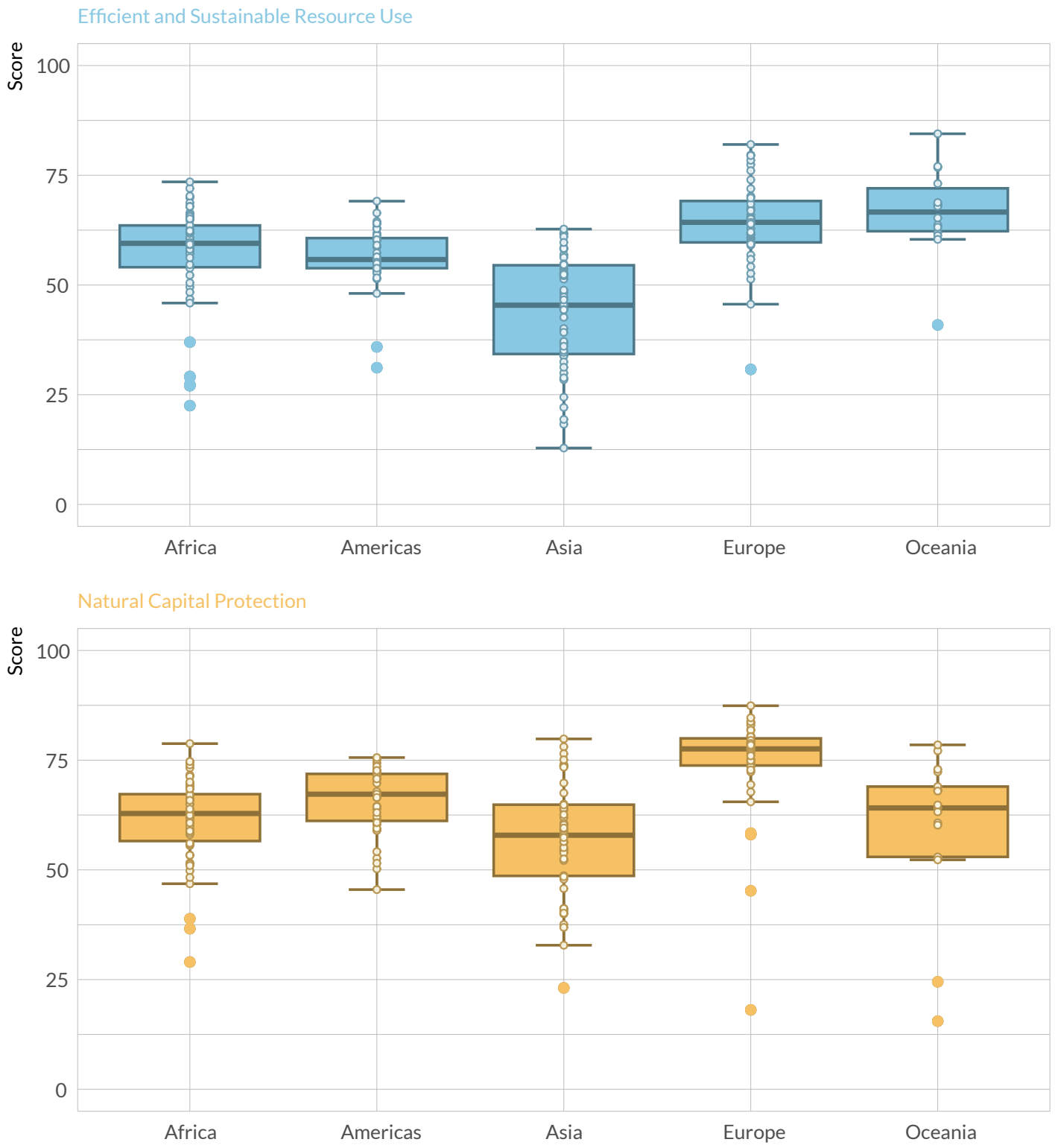
Figure 21 presents the distribution of country scores for the four green growth dimensions and reveals more information on the green growth performance of other countries in Oceania. While country performance in Oceania for social inclusion and natural capital protection dimensions approaches those in other regions, it tends to follow the distribution of European countries as far as efficient and sustainable resource use is concerned. Unfortunately, Oceania countries continue to lack data on green economic opportunities. Generally, European countries performed better in natural capital protection than other countries, albeit there are four outliers – Ireland, Iceland, Russia, and Monaco, from which Monaco has a very low score of only 18.09. This is almost as low as the lowest value of 15.53 for Guam in Oceania. Notably, while many European countries have better scores on green economic opportunities, they also have low scores, like most countries in other regions. The European countries excelled in social inclusion, with high and very high scores, with a single country outlier, Ukraine, which still has a high value of 74.78. This region is

Figure 20. Distribution pattern of country scores for the Green Growth Index by region, 2023



approaching the sustainability goal of leaving no one behind. On the other hand, this remained a significant challenge in many African countries as many have low and few others even have very low performance in social inclusion. The three African countries with very low scores for social inclusion include the Central African Republic, South Sudan, and Chad.

Figure 21. Distribution pattern of country scores for the green growth dimensions by region, 2023

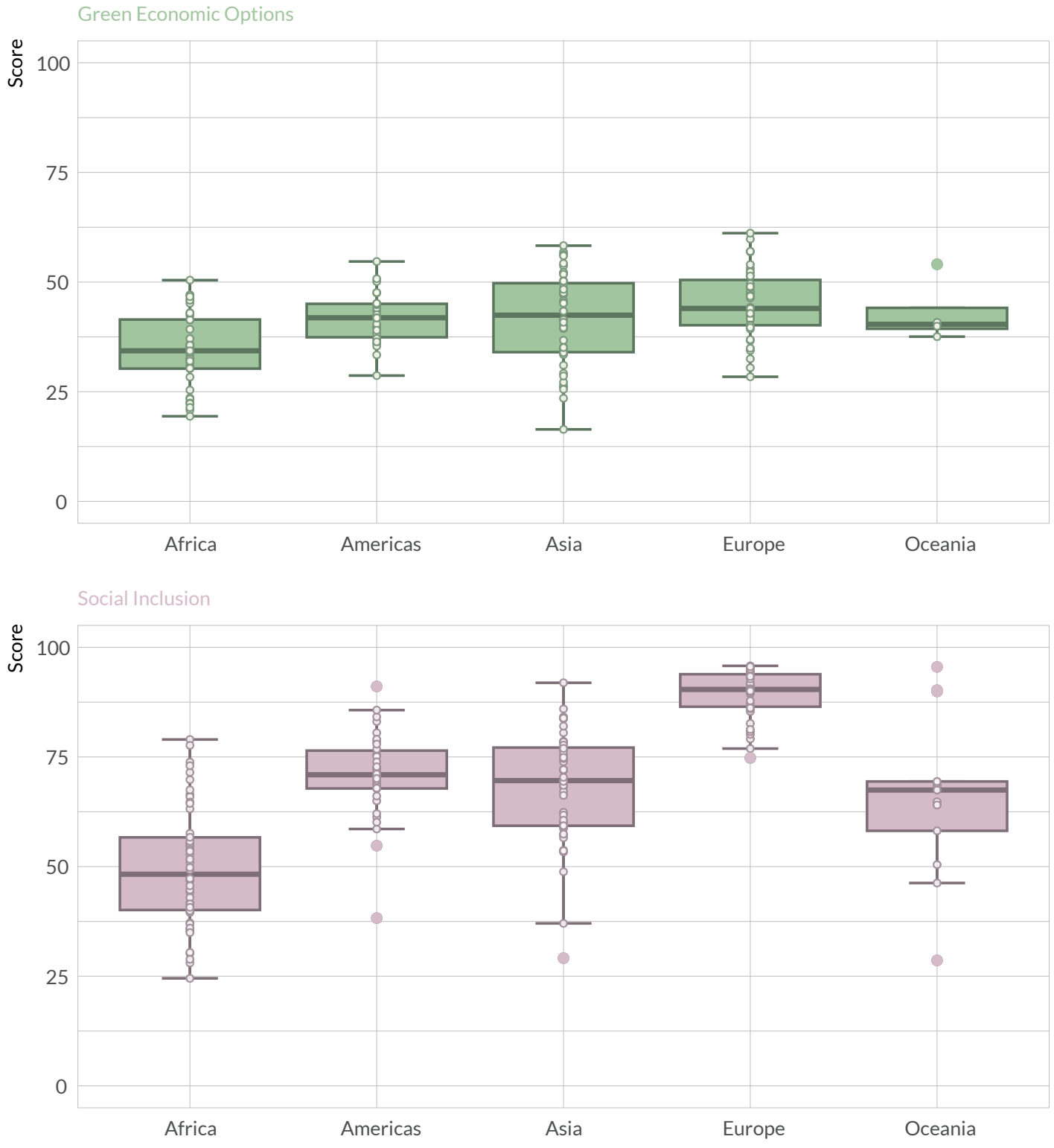


Dimensions:

Efficient and sustainable resource use | Natural capital protection

Outliers in the Americas region in social inclusion are Haiti and Honduras, with scores of 38.25 and 54.77, respectively. The distribution of scores was promising for natural capital protection, where countries across regions, including Africa, tended to gather at the upper end of the scatter diagram, closer to the sustainability targets.

Figure 21. Distribution pattern of country scores for the green growth dimensions by region, 2023 *(continued)*



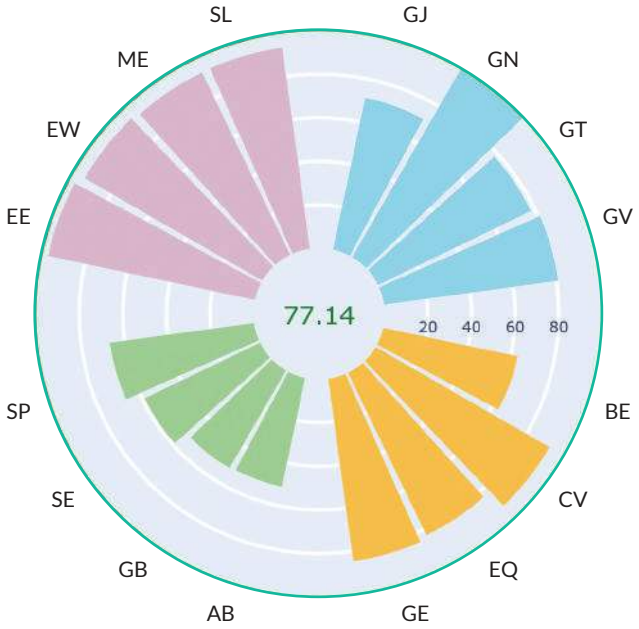
4.2 Best performers by region

In the 2024 Green Growth Index, the top-ranking countries by region were Switzerland in Europe, Japan in Asia, the United States of America in the Americas, New Zealand in Oceania, and Gabon in Africa. Switzerland emerged as a global leader in green growth due to its robust environmental governance, sustainable resource management, and advanced water efficiency policies. Japan excelled in social inclusion and environmental quality, though challenges remain in gender equality and renewable energy adoption. The United States demonstrated strength in social inclusion but faced barriers to renewable energy employment and sustainable fisheries due to regulatory fragmentation and reliance on capital-intensive technologies. New Zealand led in social inclusion and cultural conservation but struggled with sustainable fisheries due to overfishing and destructive practices, while its organic agriculture sector faced economic and regulatory challenges. Gabon stood out in Africa for its sustainable resource use and natural capital protection but needed progress in creating green economic opportunities and fostering industrial innovation. Details on the green growth performance of these top-performing countries are presented below.

Switzerland had a high green growth performance, topping both regional and global rankings. It recorded a 2.46 percent increase in scores from 75.29 in 2010 to 77.14 in 2023 (Figure 22). Its Green Growth Index score was about 11 points higher than the average for Europe and 15 points higher than the group averages for the high-income and very high-HDI countries in 2023. Due to a lack of data for several indicators, particularly for sustainable fisheries as a proportion of GDP (EW3), average of food loss to production and food waste to consumption (ME3), tourism and recreation in coastal and marine areas (CV2), municipal solid waste (MSW) generation per capita (EQ3), employed population below international poverty line (GJ3), installed renewable energy-generating capacity (GN3), degree of integrated water resources management implementation, financing (GV2), and population with access to basic services, i.e. aater, sanitation, electricity, and clean fuels (AB3), the confidence level for Switzerland's scores from 2010 to 2023 is only moderate. Switzerland progressed closer to achieving all its targets in social inclusion, reflected by a dimension score of 94.53 (Table 1). However, Switzerland ranked only eighth in social inclusion, with Finland occupying the

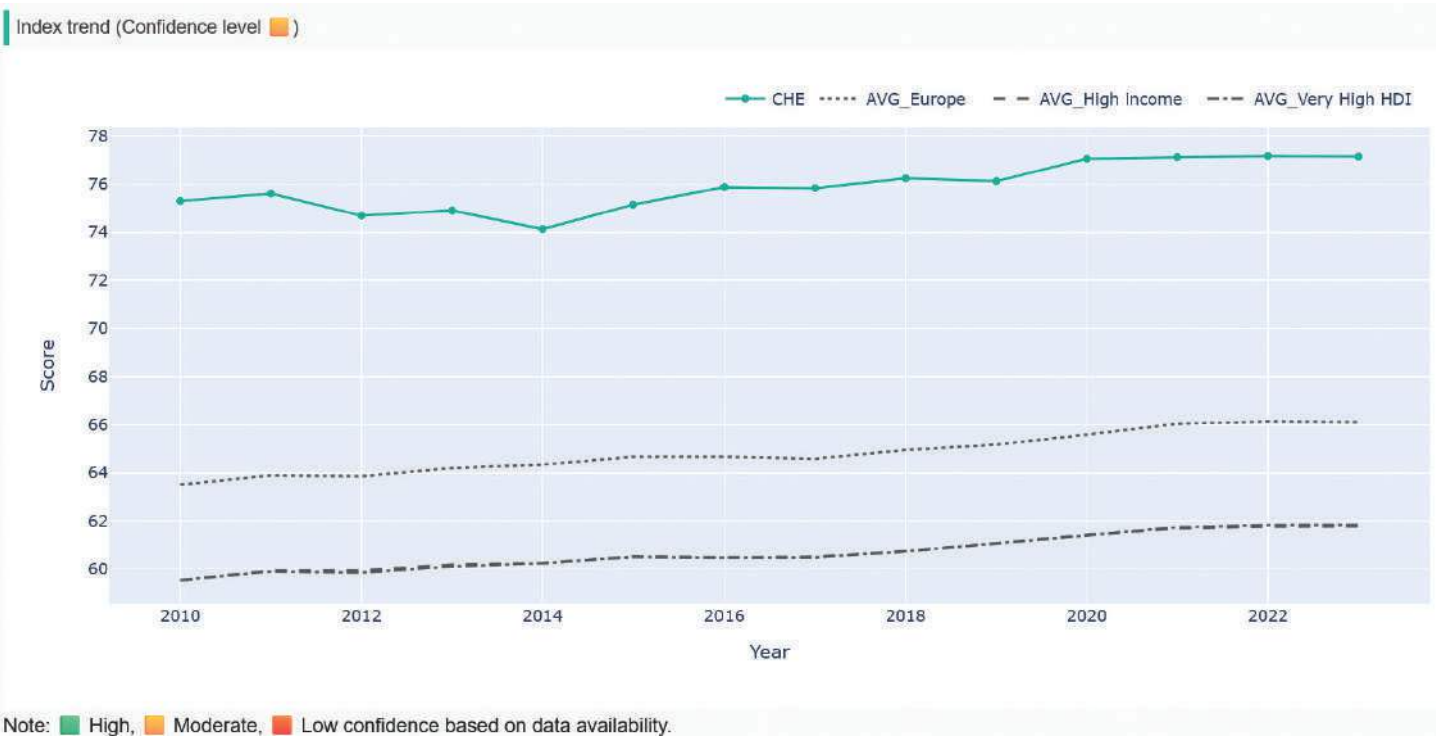
first rank with a score of 95.77. Nonetheless, Switzerland overtook Finland's very high performance in the other three green growth dimensions (as well as the performance of the other six countries: Sweden, New Zealand, Belgium, Norway, Denmark, and Austria). Switzerland's performances in efficient and sustainable resource use and natural capital protection dimensions were 82.02 and 80.12 in 2023, respectively. In the former dimension, achieving the targets for water use efficiency (EW1), the share of freshwater withdrawal to available freshwater resources (EW2), and the share of agriculture organic to total agriculture land area (SL2) contributed to the very high performance. Water consumption per capita is declining in Switzerland due to household water-efficient devices such as showerheads, dishwashers, laundry machines, etc.[121], affecting the water use and withdrawal indicators positively. Moreover, good governance of sufficiently available water and relocation of water-intensive Swiss-owned firms abroad[122] contribute to the very high performance in efficient and sustainable water use. Conventional farms in Switzerland need to adhere to strict environmental regulations (in return for governmental support payments) that conserve ecosystem health, aligning them with organic farming practices. Hence, conventional intensive agriculture, as known in other countries, has almost disappeared.[123] Although Switzerland has the highest European score for efficient and sustainable resource use, it only ranked 11th in natural capital protection. Switzerland's opportunities to improve its performance

Figure 22. Distance to targets in 2023 and Green Growth Index trend for 2010-2023, Switzerland



Dimensions:

Efficient and sustainable resource use	Natural capital protection
EE – efficient and sustainable energy EW – efficient and sustainable water use SL – sustainable land use ME – waste and material use efficiency	EQ – environmental quality GE – greenhouse gas emissions reduction BE – biodiversity and ecosystem protection CV – cultural and social value
Green economic opportunities	Social inclusion
GV – green investment GT – green trade GJ – green employment GN – green innovation	AB – access to basic services and resources GB – gender balance SE – social equity SP – social protection

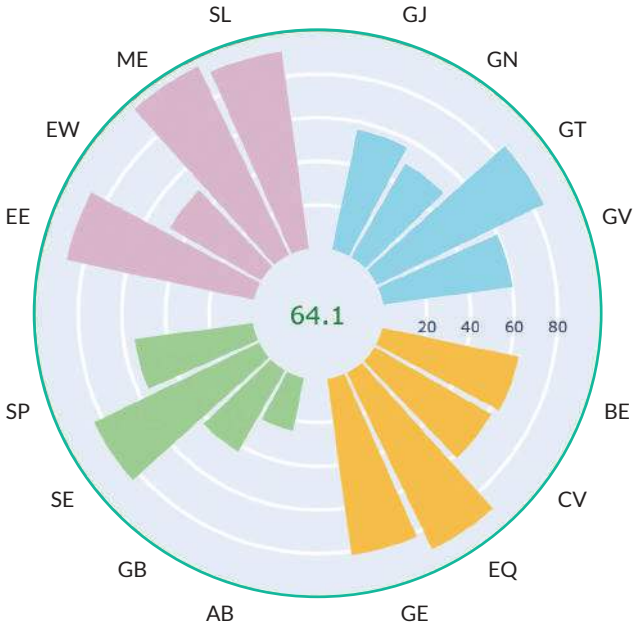


Note: High, Moderate, Low confidence based on data availability.

further in natural capital protection would be in biodiversity and ecosystem protection (BE), whose score is currently only at 63.4. The specific indicators to create these opportunities in this dimension would be the proportion of terrestrial, freshwater, marine, and mountain KBAs in protected areas (BE1) and above-ground biomass stock in the forest (BE3). Switzerland had a moderate score of 57.01 in green economic opportunities in 2023 and ranked 3rd in the region and 4th globally. Its lowest-performing indicator is in green employment (GJ), with a score of 51.35, but anyway, it ranks 4th in Europe on this indicator. Lengthy legal proceedings and administrative bottlenecks delay the development of renewable energy projects and grid expansions[124], contributing to the slow creation of green employment in Switzerland's renewable energy sector. Improvement is also necessary in green trade, where Switzerland scored 59.07 and ranked only 32nd in Europe.

Japan continues its leadership on Asia's green growth performance in 2023. Its Green Growth Index scores increased by 3.89 percent, from 61.7 in 2010 to 64.1 in 2023 (Figure 23). However, the increasing green growth performance trend was visible only from 2016 to 2023. Before 2016, the performance followed a declining trend. Japan's score was 13 points higher than the average score for Asia. However, compared with the average scores of high-income and very high-HDI countries, its score was only 2 points higher in 2023. Unlike Switzerland, Japan's Green

Figure 23. Distance to targets in 2023 and Green Growth Index trend for 2010-2023, Japan



Dimensions:

Efficient and sustainable resource use	Natural capital protection
EE – efficient and sustainable energy EW – efficient and sustainable water use SL – sustainable land use ME – waste and material use efficiency	EQ – environmental quality GE – greenhouse gas emissions reduction BE – biodiversity and ecosystem protection CV – cultural and social value
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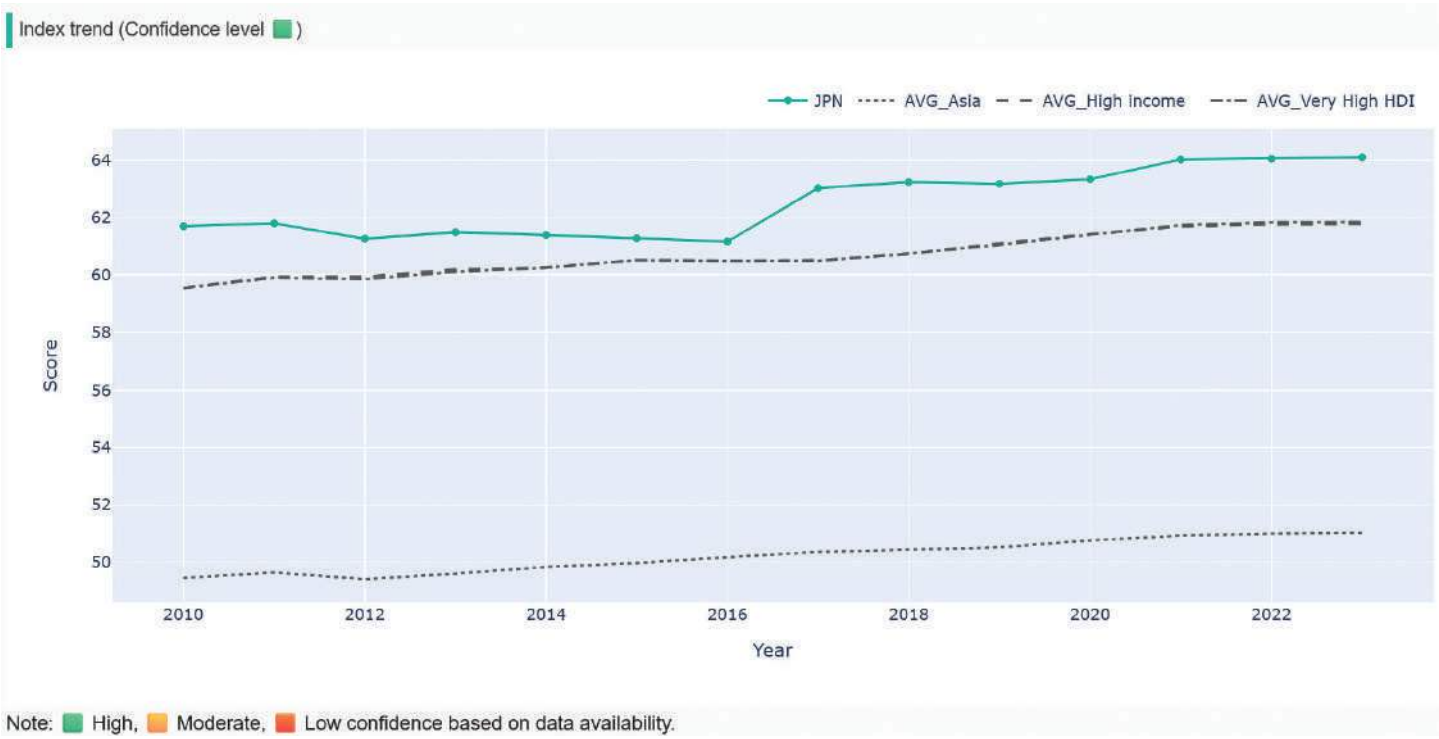


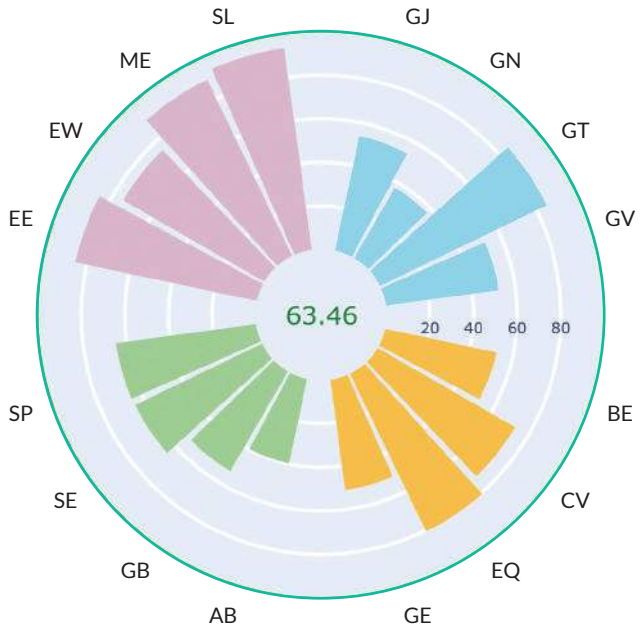
Note: High, Moderate, Low confidence based on data availability.

Growth Index scores have a high confidence level due to better data availability from 2010 to 2023. Like Switzerland, it performed best in social inclusion, almost reaching the social equity (SE) target with a score of 96.27 in 2023. Although the scores in access to basic services and resources (AB) and social protection (SP) were also very high (88.05 and 91.58, respectively), Japan had only a moderate score of 48.72 in gender balance (GB). Japan's overall performance in social inclusion resulted in a score of 78.42, corresponding to the 9th rank in Asia (Table 1). Traditional gender norms and social expectations cause systematic biases, hindering Japan's progress toward gender equality.[125] The environmental quality (EQ) score of 90.21 is the highest in the natural capital protection dimension. Still, Japan can improve its performance in this dimension by increasing the scores for cultural and social value (CV) and biodiversity and ecosystem protection (BE), currently at 62.0 and 64.38, respectively. Japan occupies the sixth rank in natural capital protection in Asia. Population density and human activities from urbanization expose the country's ecosystems, endangering one of the world's 36 biodiversity hotspots.[126] For green economic opportunities, it ranked 17th with a score of 47.33. Japan scored the lowest in green employment (GJ) at the pillar level, scoring low at 25.03. Japan's renewable energy transition, which will create green employment, is slow because it continues to rely on nuclear power and, after reducing nuclear reliance after the Fukushima disaster in 2011, increased dependence on imported liquefied natural gas (LNG).[127] Performance in the share of renewable to total final energy consumption (EE2) is very low in Japan, scoring only 18.03 in 2023 (Chapter 9). The country's efficient and sustainable resource use performance is 61.70, corresponding to the third highest in Asia. In this dimension, Japan can improve performance in efficient and sustainable energy and water use, with moderate scores of 56.65 and 49.93, respectively. The country's water use efficiency (EW1) is low, scoring 21.73 in 2023 (Chapter 9). Challenges include outdated irrigation systems, water-intensive crop production[128], aging municipal water utilities infrastructure[129], and rigid water rights[130].

The **United States of America**, the leader of the Americas region, shows high green growth performance with a score of 63.46 and ranks 30th globally, after 27 European countries, Japan, and New Zealand. In 2023, it scored only one point higher than the average score of its peers in high-income and very high-HDI countries and six points relative to the average score in the American region (Figure 24). The United States' Green Growth Index scores grew only by 2.62 percent, slightly lower than Japan's. The scores' confidence level is only moderate due to data gaps in several indicators, including total material footprint (MF) per capita (ME2), nutrient balance per unit area (SL1), municipal solid waste (MSW) generation per capita (EQ3),

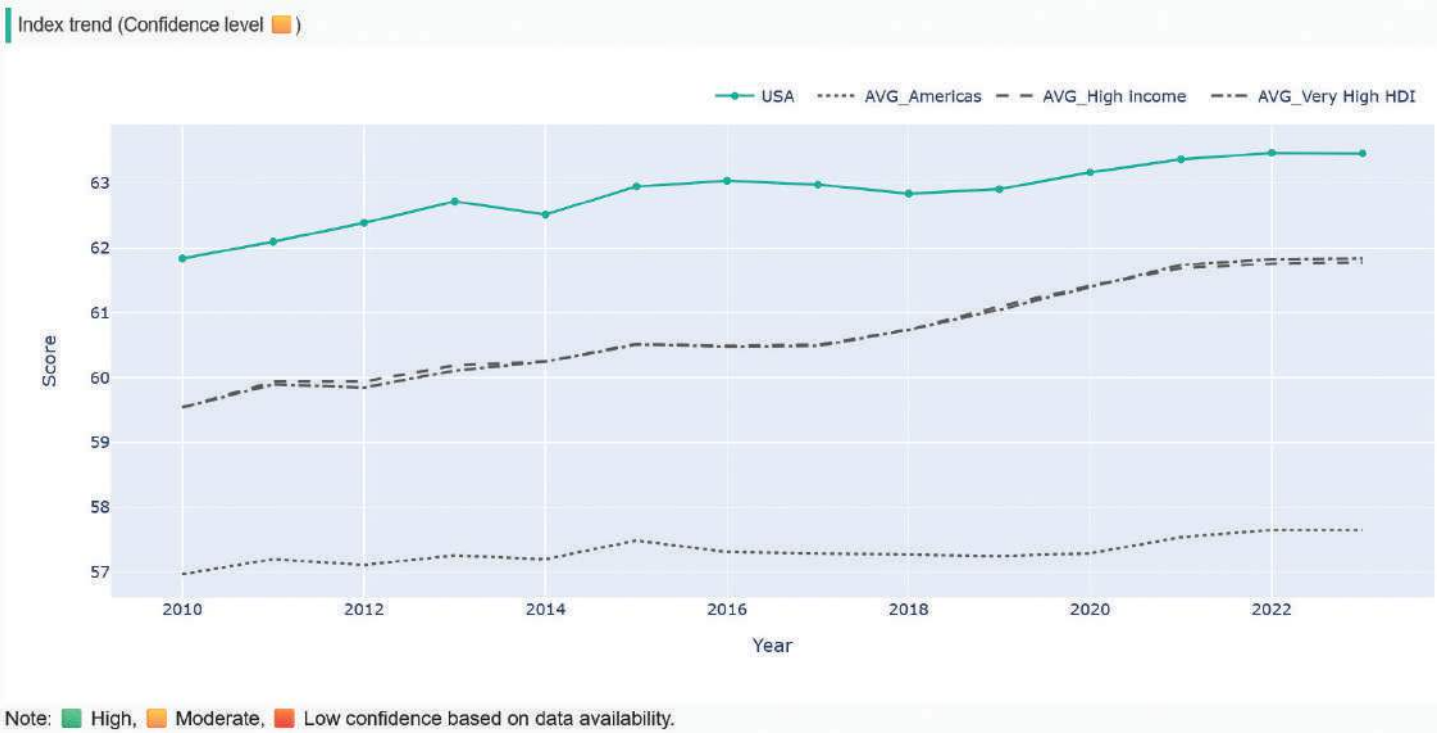
employed population below international poverty line (GJ3), installed renewable energy-generating capacity (GN3), water virtual trade flows (GT3), total amount of funding to promote environmentally sound technologies per GDP (GV3), and population with access to basic services, i.e. Water, sanitation, electricity, and clean fuels (AB3). The United States' performance in green economic opportunities measures 54.69, and while it is the highest in the region, it is only sixth globally. However, because the performance of green economic opportunities was low in many American countries, it occupied the first rank in the region in 2023. The green employment (GJ) score of 39.86 is very low, one of the lowest in the region, followed only by Panama, Canada, and Uruguay. The score in the ratio of renewable energy employment to renewable energy production (GJ2) was low at 4.02 in 2023, indicating reduced overall labor intensity of renewable energy projects. This can be attributed to the impact of automation due to technological progress and focus on large-scale projects relying on capital investment rather than labor.[131] Opportunities are available to improve the performance in the green economic opportunities dimension by increasing the score for green innovation (GN), which is currently at 53.04. It scored 85.68 for social inclusion in 2023, with very high scores for all pillars in this dimension. However, it only occupied the second rank after Canada in social inclusion. The lowest-performing social

Figure 24. Distance to targets in 2023 and Green Growth Index trend for 2010-2023, United States of America



Dimensions:

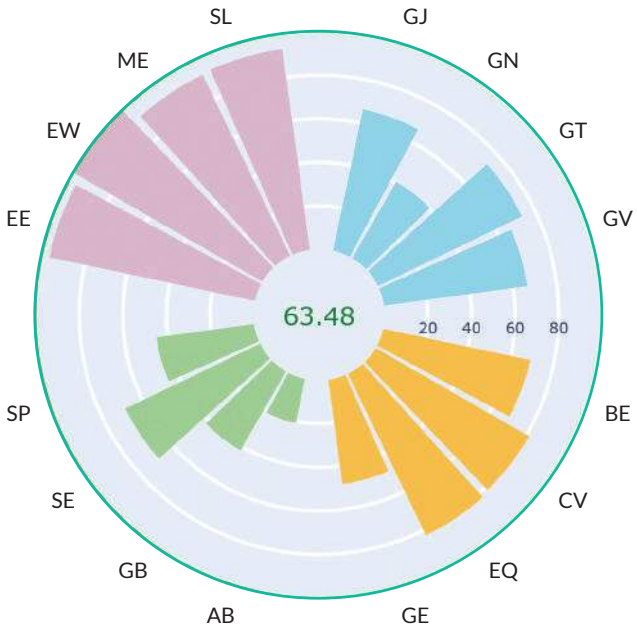
Efficient and sustainable resource use	Natural capital protection
EE – efficient and sustainable energy EW – efficient and sustainable water use SL – sustainable land use ME – waste and material use efficiency	EQ – environmental quality GE – greenhouse gas emissions reduction BE – biodiversity and ecosystem protection CV – cultural and social value
Green economic opportunities	Social inclusion
GV – green investment GT – green trade GJ – green employment GN – green innovation	AB – access to basic services and resources GB – gender balance SE – social equity SP – social protection



inclusion indicator in the United States is the proportion of seats held by women in national parliaments (GB1), scoring 51.3 in 2023 (Chapter 9). Challenges include partisan biases facing women legislators in the U.S. Congress, which affect evaluations and electoral success, and persistent gender stereotypes, with women often perceived as less suitable for leadership roles.[132] The country's efficient and sustainable resource use performance is only 54.87, corresponding to one of the lowest in the Americas. It can improve its efficient and sustainable water use (EW) score of 37.58. This is particularly the case for the indicator on sustainable fisheries (EW3), scoring very low at 1.11. Challenges to improving performance in this indicator include fragmented government regulations and deregulations of wild-capture fisheries, which reduce investment and hinder sustainable management in the fisheries sector.[133] In natural capital protection, the United States ranks 27th in the region. The performance in this dimension can be improved by scoring better on greenhouse gas emissions reduction (GE) and biodiversity and ecosystem protection (BE), which currently show 51.30 and 52.44, respectively.

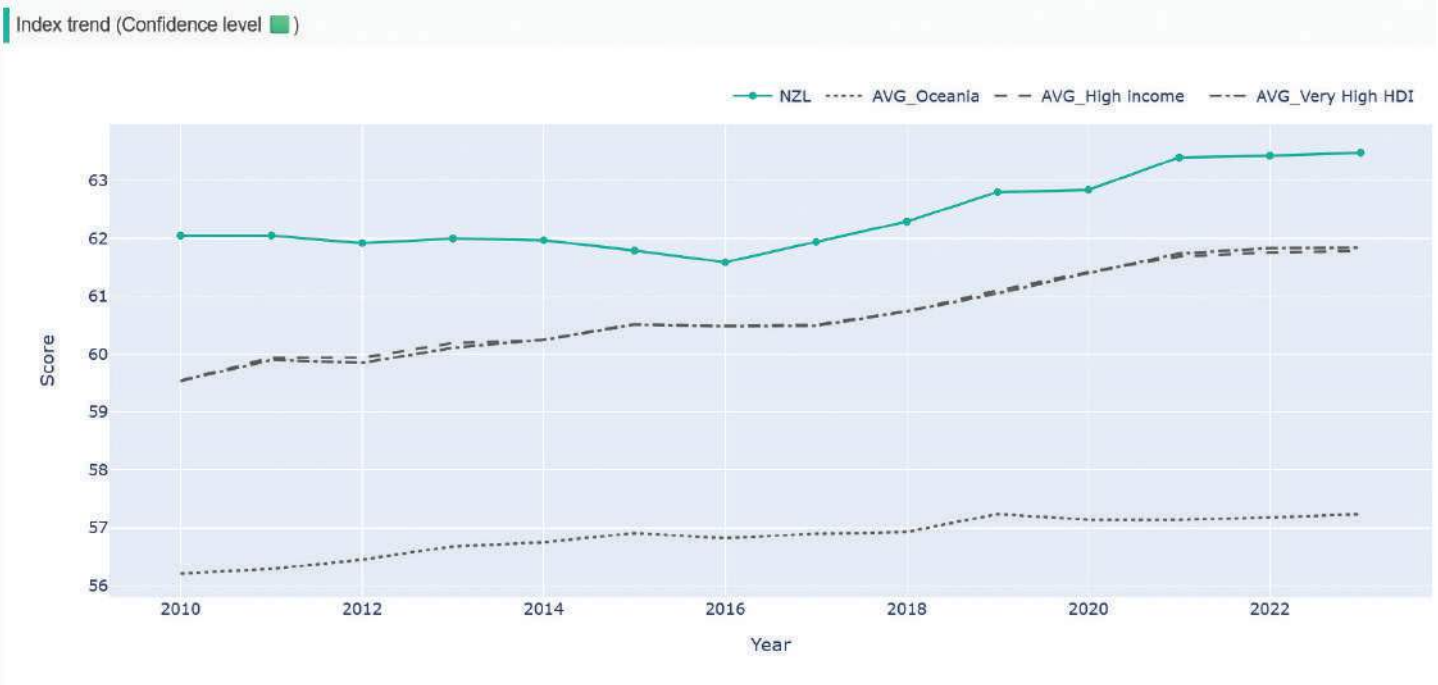
New Zealand again leads in the 2023 ranking on green growth performance in Oceania. Its Green Growth Index scores increased by 2.30 percent, from 62.05 in 2010 to 63.48 in 2023 (Figure 25). Like the United States,

Figure 25. Distance to targets in 2023 and Green Growth Index trend for 2010-2023, New Zealand



Dimensions:

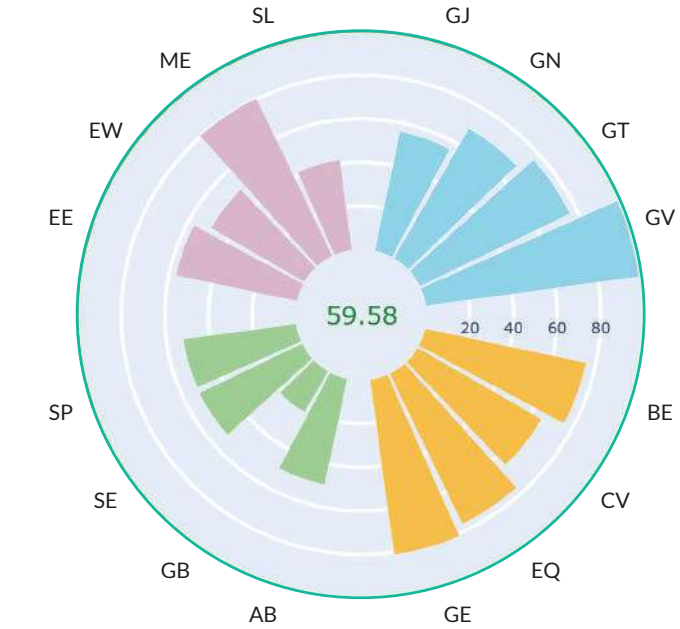
Efficient and sustainable resource use	Natural capital protection
EE – efficient and sustainable energy EW – efficient and sustainable water use SL – sustainable land use ME – waste and material use efficiency	EQ – environmental quality GE – greenhouse gas emissions reduction BE – biodiversity and ecosystem protection CV – cultural and social value
Green economic opportunities	Social inclusion
GV – green investment GT – green trade GJ – green employment GN – green innovation	AB – access to basic services and resources GB – gender balance SE – social equity SP – social protection



Note: High, Moderate, Low confidence based on data availability.

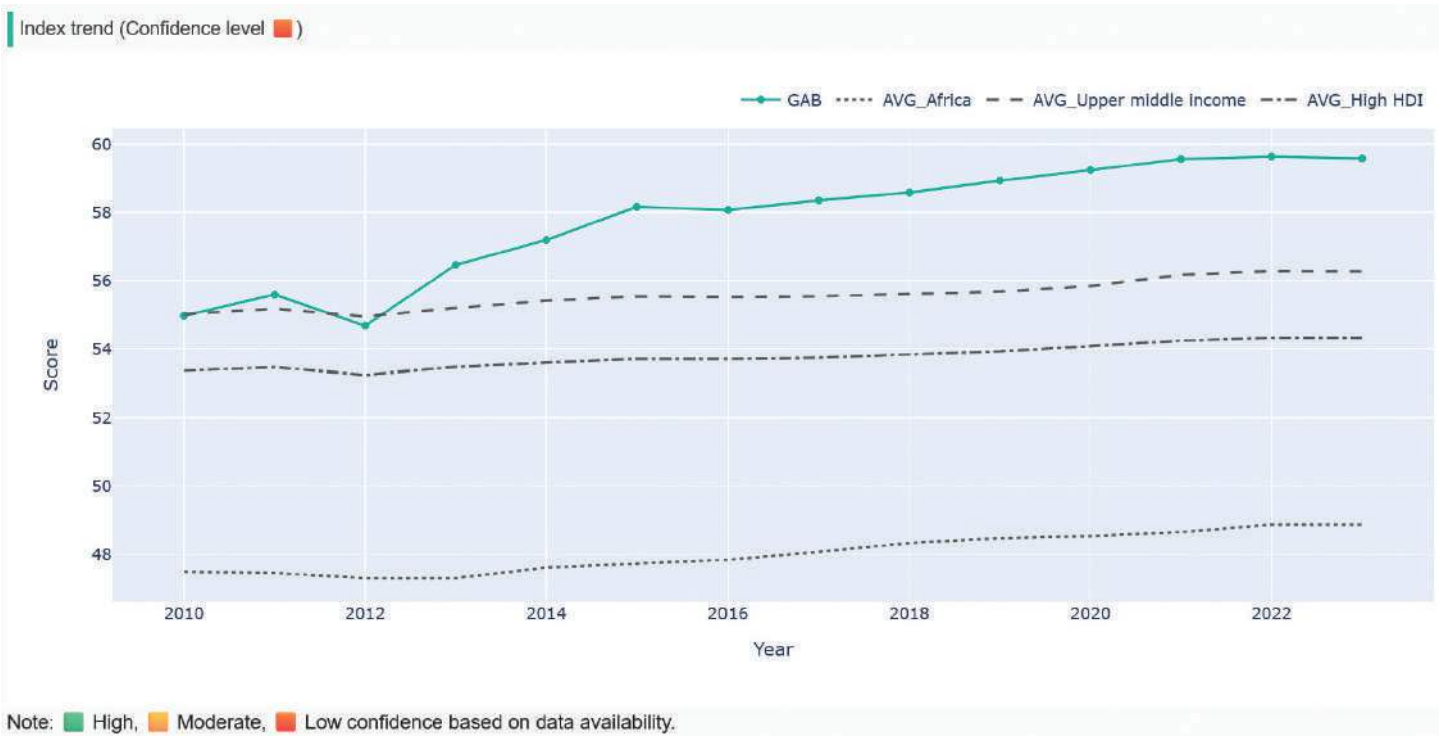
New Zealand scored only one point higher than the average score of its peers in high-income and very high-HDI countries and six points relative to the average score in the American region in 2023. Like Japan, New Zealand's Green Growth Index scores have a high confidence level due to better data availability from 2010 to 2023. It performed best in social inclusion, scoring 95.54 in this dimension and very high across all pillars in 2023. It occupied the first rank ahead of New Caledonia and Australia in social inclusion. New Zealand also performed excellently in natural capital protection, occupying the 1st and 3rd ranks in cultural and social value (CV) and biodiversity and ecosystems protection (BE), respectively, in Oceania. Green growth performance can be improved in GHG emissions reduction (GE), scoring low at 48.60 and corresponding to 13th rank in the region. However, opportunities lie in improving scores for efficient and sustainable resource use and green economic opportunities. New Zealand can still enhance its score for efficient and sustainable water use (EW) of 40.72. This is particularly the case for the indicator on sustainable fisheries (EW3), scoring very low at 6.39. A few major fishing companies have been criticized for overfishing that depletes fish populations,

Figure 26. Distance to targets in 2023 and Green Growth Index trend for 2010-2023, Gabon



Dimensions:

Efficient and sustainable resource use	Natural capital protection
EE – efficient and sustainable energy EW – efficient and sustainable water use SL – sustainable land use ME – waste and material use efficiency	EQ – environmental quality GE – greenhouse gas emissions reduction BE – biodiversity and ecosystem protection CV – cultural and social value
Green economic opportunities	Social inclusion
GV – green investment GT – green trade GJ – green employment GN – green innovation	AB – access to basic services and resources GB – gender balance SE – social equity SP – social protection



Note: High, Moderate, Low confidence based on data availability.

using destructive practices (e.g., bottom trawling) that destroy corals and degrade seabed, and bycatch of dolphins and seabirds.[134] Similarly, increasing sustainable land use (SL) performance, particularly in the share of organic agriculture to total agriculture land area (SL2) with a score of 7.74, will allow New Zealand to catch up with Australia and Fiji. Challenges confronting New Zealand in enhancing organic agriculture adoption include apprehensiveness among farmers about economic viability, labor-intensive, expensive certification costs, and complex and unpredictable regulations.[135] Regarding green economic opportunities, New Zealand ranked second in the region. However, it performed low in green employment (GJ), with a score of 21.03.

Gabon's overall Index score was 59.58, only a few points away from New Zealand's due to its relatively high scores in many dimensions, except for green economic opportunities. Specifically, it ranked first in efficient and sustainable resource use and third in natural capital protection in Africa. Gabon consistently outperformed its peer countries, scoring 4 points above the average for upper middle-income countries, 6 points above the average for high-HDI countries, and 12 points above the average for the African region in 2023 (Figure 26). However, like African countries, its Green Growth Index scores only have low confidence levels due to data gaps from 2010 to 2023. It lacks data on sustainable fisheries as a proportion of GDP (EW3), the share of agriculture organic to total agriculture land area (SL2), municipal solid waste (MSW) generation per capita (EQ3), the share of green manufacturing employment in total manufacturing employment (GJ1), CO_2 emissions embedded in trade (GT2), the total amount of funding to promote environmentally sound technologies per GDP (GV3), the proportion of population with convenient access to public transport (AB3), share of youth (aged 15-24 years) not in education, employment or training (SE3), and proportion of population above statutory pensionable age receiving pension (SP1). With a score of 73.50 in efficient and sustainable resource use, it outperforms all the other top-performing countries in different regions, except for Switzerland in Europe. Regarding social inclusion, it had moderate performance in social protection (SP) and gender balance (GB), with scores of 41.69 and 49.64, respectively. Specific indicators related to universal health coverage (SP2) and equal gender pay (GB3) lowered the country's scores. Gabon scored 30.79 in the former and 25.75 in the latter indicator. Gabon made significant health financing reforms in the 1990s, which were not fully implemented due to challenges in public financial management measures (PFM), misaligned health budget priorities, and disruptions in the overall PFM system.[136] Although the government implemented legislative reforms enhancing women's rights and economic participation, they continue to have limited employment opportunities and financial inclusion.[137] Creating green economic opportunities will help further improve the country's green growth performance. Green innovation had a low score of 21.71, mainly due to the poor performance in installed renewable energy-generating capacity (GN3), scoring 10.61 in 2023. The urban population is rapidly growing, with at least 80 percent accessing electricity, and natural gas is slowly replacing oil as an energy source.[138] However, rural areas have an electrification rate of less than 40 percent due to the lack of installed renewable energy capacity.[139] However, Gabon lacks green employment (GJ) data on the indicator share of green manufacturing employment in total manufacturing employment (GJ1), which hinders a more accurate comparison of its performance vis-à-vis top-performing countries in the other regions.

5 Featured Country: Lao PDR

5.1 Green growth contexts

Lao PDR, a landlocked Southeast Asian country, has rich natural resources and biodiversity, providing a solid foundation for green growth initiatives. The country has a unique opportunity to leverage its abundant natural wealth to foster sustainable development while addressing economic, social, and environmental challenges. This section provides an overview of Lao PDR's green growth context, focusing on its economy, society, and environment.

5.1.1 Economy

Lao PDR's economy predominantly relies on agriculture, with rice as its primary crop. In recent years, sectors such as mining, hydropower, and tourism have shown substantial growth, contributing to a GDP increase of 3.7 percent in 2023, up from 2.7 percent in 2022.[140] This recovery reflects stronger performance in transportation, logistics services, and increased foreign investments. Tourism has particularly benefitted from the post-COVID-19 recovery, attracting foreign capital and creating new job opportunities. However, economic challenges persist, including the depreciation of the kip currency, labor shortages, and climate-related adversities such as droughts and floods. Public debt remains a critical issue, reaching 97 percent of GDP in 2022, despite a nominal decrease in dollar terms.[141] Rising food inflation, averaging 45.6 percent in 2023 compared to 12.3 percent in 2022, has strained household spending, further compounded by supply chain disruptions and adverse weather conditions.

The agricultural sector, the backbone of the economy, faces climate-related risks, including reduced crop yields, soil degradation, and resource scarcity. Hydropower production, vital for the country's economy, is similarly impacted by fluctuating water levels, posing challenges to energy security and export revenues. Diversifying economic activities and enhancing value chains in key sectors, such as agriculture and energy, are critical for building resilience. Moreover, promoting green investments and strengthening public-private partnerships can help mitigate these vulnerabilities while driving sustainable economic growth.

5.1.2 Society

Lao PDR has a young and dynamic population of approximately 7.4 million[142], with nearly 60 percent under the age of 25[143]. Agriculture employs 69 percent of the total workforce, with 70 percent of women engaged in farming activities such as rice cultivation, livestock farming, and coffee production.[144] Despite progress, challenges persist, including low labor force participation (47 percent for individuals aged 15+), with a significant portion of the workforce engaged in informal employment. The poverty rate has declined from 46 percent in 1993 to 18 percent in 2019[145], but disparities remain, particularly in rural areas where access to markets, education, and healthcare is limited. Education has seen notable improvements, with a primary gross enrollment rate of 97 percent[146], yet rural-urban disparities in access to quality education and infrastructure persist. Initiatives to improve educational opportunities for girls and marginalized groups have shown promise but require sustained effort and investment.

Health challenges include high rates of malnutrition—affecting 33 percent of children under five—and limited access to healthcare services and clean water.[147] Public health infrastructure remains underdeveloped, with significant gaps in rural areas. Efforts to reduce maternal and child mortality have yielded positive outcomes, but more work is needed to tackle rising rates of non-communicable diseases such as diabetes and cardiovascular conditions, which are exacerbated by climate change impacts. Access to electricity has improved significantly, with over 90 percent of the population now connected to the grid[148], primarily through hydropower. However, gaps in basic sanitation and clean water availability remain substantial, particularly in rural communities. Strengthening healthcare systems and addressing disparities in public services are essential for improving overall societal well-being and resilience.

5.1.3 Environment

Lao PDR is rich in biodiversity and natural resources, including extensive forest cover, water resources, and fertile soil. However, rapid economic growth driven by resource-intensive sectors such as logging, mining, and hydropower has led to environmental degradation. Deforestation rates are among the highest in the region, with forest cover decreasing from 70 percent in the 1950s to 58 percent in 2015.[149] Agricultural expansion, infrastructure development, and illegal logging have exacerbated the problem, threatening the habitats of diverse plant and animal species. The government's REDD+ strategy aims to restore forest cover to 70 percent by 2030[150], but implementation faces challenges due to limited financial and technical capacity. Water pollution is also a growing concern, particularly in urban areas where untreated wastewater poses risks to human health and aquatic ecosystems.

Air pollution from agricultural burning and industrial activities has become a major health and environmental issue. PM2.5 air pollution is responsible for an estimated 10,000 premature deaths annually, with pollutant levels exceeding WHO-recommended thresholds.[151] Additionally, climate change impacts, including rising temperatures, prolonged droughts, and severe floods, have intensified over the past decade, disrupting livelihoods and ecosystems. Greenhouse gas emissions are rising, primarily from agriculture, forestry, and energy sectors, highlighting the urgent need for mitigation strategies. Despite these challenges, Lao PDR has significant potential to enhance its climate resilience through investments in renewable energy, sustainable land-use practices, and biodiversity conservation. Strengthened

partnerships with international organizations and NGOs will be essential in achieving the country's environmental and climate targets, including net-zero emissions by 2050.

Both opportunities and challenges mark Lao PDR's green growth journey. The interplay of economic growth, social development, and environmental sustainability necessitates integrated strategies and strong commitments to ensure long-term prosperity and resilience. The country's rich natural resources and young population present immense potential for driving sustainable development, provided the challenges of climate change, inequality, and environmental degradation are effectively addressed.

5.2 National experts

The development of the Lao PDR Green Growth Index was a collaborative effort that actively engaged national experts from various sectors to ensure that the Index reflects the country's specific context and priorities. The project, initiated on July 1, 2022, through a partnership between the Global Green Growth Institute (GGGI) and the Ministry of Planning and Investment (MPI), involved extensive participatory activities. These included webinars, online surveys, workshops, and consultations with ministries. A total of 159 experts from 20 institutions contributed to this process, providing invaluable input across the four dimensions of green growth: efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. The participatory approach resulted in the selection of 80 policy-relevant green growth indicators, tailored to the national context of Lao PDR. These indicators were chosen to align with the country's development goals and to address specific challenges and opportunities identified during the engagement process. The project also served as a capacity-building initiative, empowering local experts to enhance their understanding of green growth metrics and methodologies.

Participants represented various organizations, including 15 government agencies, three non-governmental organizations (NGOs), one academic institution, and one private sector entity. Key contributors included the Ministry of Agriculture and Forestry (MAF), which had the highest number of participants (25), and the MPI's Development Research Institute (DRI), which actively participated in five activities. Contributions from other ministries such as Energy and Mines, Education and Sports, and Natural Resources and Environment were instrumental in shaping the Index. Table 2 provides a detailed breakdown of participating institutions and sectors, and their involvement in the design process. This inclusive and collaborative process highlights the importance of leveraging local expertise to develop a Green Growth Index that is both context-specific and actionable. The participation of national experts ensured that the Index is robust and reflective of Lao PDR's unique development trajectory, offering a comprehensive tool for guiding the green growth transition.

Table 2. Participants in the design process of the Lao PDR Green Growth Index

Ministries/Institutions	Sector	Number of participants	Number of activities participated
Ministry of Planning and Investment - Development Research Institute (DRI)	GOVT	21	5
Ministry of Planning and Investment (MPI)	GOVT	16	4
Lao Statistics Bureau (LSB)	GOVT	8	3
Ministry of Agriculture and Forestry (MAF)	GOVT	25	4
Ministry of Energy and Mines (MEM)	GOVT	18	4
Ministry of Education and Sports (MES)	GOVT	3	3
Ministry of Foreign Affairs (MOFA)	GOVT	1	1
Ministry of Health (MOH)	GOVT	6	4
Ministry of Industry and Commerce (MOIC)	GOVT	9	4
Ministry of Information, Culture and Tourism (MoICT)	GOVT	14	4
Ministry of Labor and Social Welfare (MoLSW)	GOVT	10	4
Ministry of Natural Resources and Environment (MoNRE)	GOVT	6	5
Ministry of Public Works and Transport (MPWT)	GOVT	11	4

Table 2. Participants in the design process of the Lao PDR Green Growth Index *(continued)*

Ministries/Institutions	Sector	Number of participants	Number of activities participated
Ministry of Technology and Communication (MTC)	GOVT	3	3
National Economic Research Institute (NERI)	GOVT	1	1
British Embassy Vientiane (UK Embassy)	NGO	1	1
United Nations Development Programme (UNDP)	NGO	1	1
Lao Women's Union (LWU)	NGO	2	1
Lao Academy of Social and Economic Science (LASES)	ACA	2	2
ST Bank Laos (STB)	PVT	1	1
Total	20	159	

Note: GOVT – government, NGO – non-government, ACA – academic institutions, and PVT – private sector.

5.3 Design process

The development of the Lao PDR Green Growth Index followed a systematic and participatory approach to ensure the Index accurately reflected the country's specific priorities while aligning with global green growth standards. Conducted over 18 months between August 2022 and December 2023, the process involved ten key activities, each building on the outcomes of the previous one (Figure 27). These activities integrated feedback from national experts, policymakers, and other stakeholders through workshops, consultations, surveys, and dissemination events (Table 3). A total of 159 experts from 20 institutions, including representatives from 15 government ministries, three NGOs, academia, and the private sector (Table 2), actively participated. This broad engagement ensured that the Index captured diverse sectoral insights while fostering capacity building among participants.

The process began with a kick-off meeting and an introductory seminar to familiarize stakeholders with the Green Growth Index framework, objectives, and methodology. This initial activity gave participants foundational knowledge to contribute effectively to subsequent discussions. Building on this, an online survey was conducted to evaluate the policy relevance of over 200 proposed indicators. From this, 80 indicators were selected as most relevant to national development priorities. These shortlisted indicators were further refined during the first participatory workshop through collaborative group discussions and plenary voting, ensuring alignment with Lao PDR's development goals and global green growth dimensions (Figure 28). Following this, a series of targeted consultations with different ministries engaged over 60 experts to validate the indicators, address data gaps, and finalize sector-specific inputs (Figure 29). These activities also enhanced data integration by leveraging sectoral expertise to source accurate and up-to-date information.

After finalizing the 80 indicators, GGGI computed the Green Growth Index scores and shared them with experts via an interactive website during the second seminar. This platform allowed stakeholders to explore preliminary results and provide feedback, ensuring the Index reflected the most relevant insights. The findings were further examined in the second participatory workshop (Figure 27), where experts collaboratively interpreted the results and assessed their implications for Lao PDR's green growth challenges and opportunities. In addition to refining the Index, the process served as a capacity-building initiative, equipping participants with the skills to apply green growth metrics in policy contexts.

Dissemination efforts during the Global Green Growth Week showcased the Index to international audiences, drawing valuable feedback and raising awareness of its applications across diverse contexts. The process concluded with the publication of the Index report and the launch of an updated interactive website in 2024, providing comprehensive access to the final outputs. These resources empower national experts and policymakers to leverage the Index for planning, decision-making, and steering green growth strategies.

The outcomes of this process underscore the importance of inclusive and systematic engagement in developing sustainability tools. The final Green Growth Index for Lao PDR is a robust and actionable resource, reflecting the country's unique development trajectory while supporting evidence-based policymaking. It highlights key areas for targeted interventions and fosters collaboration across sectors to drive sustainable growth. Looking ahead, plans are underway to replace proxy indicators with more precise data as availability improves, ensuring the Index continues

to evolve alongside global sustainability metrics. Lessons learned from Lao PDR's experience provide a valuable blueprint for developing similar indices across Asia, further advancing the global green growth agenda.

Figure 27. Design process for the Lao PDR Green Growth Index

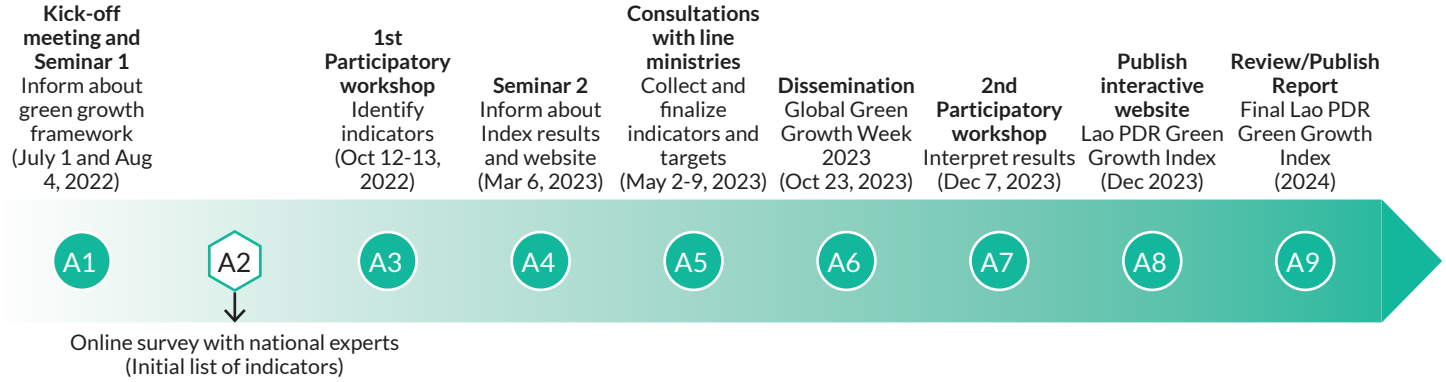


Table 3. Summary of the participatory activities in designing the Lao PDR Green Growth Index

Activities	Objectives	Outcomes
Kick-off Meeting and Initial Seminar	Introduce the Green Growth Index framework and engage stakeholders.	Experts gained foundational knowledge to participate effectively in subsequent activities.
Online Survey	Evaluate the policy relevance of over 200 proposed indicators.	Experts shortlisted 80 indicators, balancing national priorities and data availability.
First Participatory Workshop	Discuss and refine the shortlisted indicators.	Indicators were finalized across the four dimensions of green growth.
Seminar on Preliminary Results	Present preliminary Index results and train participants to navigate the interactive website.	Feedback was gathered to enhance the Green Growth Index framework and data presentation.
Consultations with Line Ministries	Confirm data sources, ensure alignment with policy priorities, and address data gaps.	Additional data were sourced, and indicators were refined to ensure accuracy.
Global Green Growth Week Dissemination	Share the Index's progress with international stakeholders.	Increased awareness and validation of the Index's methodology and application.
Second Participatory Workshop	Analyze challenges and opportunities based on Index scores.	Experts developed recommendations for improving green growth performance.
Publication of the Index Website and Report	Finalize and disseminate the Green Growth Index for Lao PDR.	The Index was officially published and made available through an interactive website.

Figure 28. Selected photos of the participants during the first (top) and second (bottom) participatory workshops

Note: The first participatory workshop was held on August 4, 2022, and the second on December 7, 2023. Details on the participants are presented in Table 1.

Figure 29. GGGI, MPI and LSB meetings with several line ministries in Lao PDR

Note: The consultations were conducted with participation from over 60 experts from different ministries from May 2 to May 9, 2023, including the Ministry of Agriculture and Forestry (MAF), Ministry of Energy and Mine (MEM), Ministry of Health (MOH), Ministry of Industry and Commerce (MOIC), Ministry of Information, Culture and Tourism (MoICT), Ministry of Labor and Social Welfare (MoLSW), Ministry of Natural Resource and Environment (MoNRE), and Ministry of Public Works and Transport (MPWT).

5.4 Green growth indicators

This section describes the green growth indicators across the four dimensions and how they align with the SDGs (Table 4). It also briefly discusses the relevance of the 80 green growth indicators to national and sectoral policies, based on the assessment presented in the Lao PDR Green Growth Index Report.[152] The key national policies considered include the Vision 2030 and 10-year Socio-Economic Development, 9th National Socio-economic Development Plan 2021- 2025 (9th NSEDP), National Green Growth Strategy (NGGS), Lao PDR Green Climate Fund Country Programme 2021-2023 (GCF), Nationally Determined Contribution (NDC), National Biodiversity Strategy and Action Plan 2016-2025 (NBSAP), National Climate Change Action Plan 2013-2020 (NCCAP), and Country Planning Framework 2021-2025 (CPF).

Efficient and sustainable resource use: The five green growth indicators in the **efficient and sustainable resource use** pillar include energy intensity (EE1), renewable energy share (EE2), efficient transport (EE3), renewable energy production (EE4), and low-carbon electricity (EE5). These indicators are highly integrated into Lao PDR's national and sectoral policies, emphasizing renewables as a cornerstone of green growth. EE1 and EE2 feature in key policies like NSEDP, NGGS, GCF, NDC, and NCCAP, while EE4 is highlighted in the 2030 Vision and National Policy on Energy Efficiency. EE5 and EE3 are also prioritized in NSEDP, with EE3 further addressing sustainable transport infrastructure to position Lao PDR as a regional transit hub. Additionally, policies encourage energy-efficient vehicles to reduce fossil fuel dependency. EE1 and EE2 are SDG indicators (7.3.1, 7.2.1), while EE3 supports SDG 11.2.1 on convenient access to public transport, and EE4/EE5 contribute to SDG 7.b.1 on installing renewable energy-generating capacity and 7.1.1. on addressing the population's access to electricity. The five green growth indicators in the **efficient and sustainable water use**: pillar include water use efficiency (EW1), level of water stress (EW2), the share of fisheries to GDP (EW3), irrigation for agriculture (EW4), and renewable water resources per capita (EW5). EW1, EW2, EW4, and EW5 are discussed in NGGS, while NSEDP mentions fish farming targets related to EW3. Fisheries are vital for rural nutrition and livelihoods, particularly for 62 percent of the population living in rural areas. Policies like the Green and Sustainable Agriculture Framework emphasize improving water resource productivity. EW1 and EW2 are part of the SDGs, while EW3 supports SDG 14.7.1, EW4 contributes to agricultural water management, and EW5 supports SDG 6.1.1 on drinking water access. The five green growth indicators in the **sustainable land use** pillar include soil nutrient balance (SL1), organic agriculture area (SL2), the share of degraded land (SL3), rice productivity (SL4), and production levels for food security and export (SL5). SL4 and SL5 are central to NGGS and NSEDP, while SL1 and SL2 feature in GSAF and the 2030 Vision. SL3, although not in national policies, is discussed in Vision 2035 and sectoral strategies addressing soil erosion and land use changes. Land degradation challenges stem from development activities and chemical overuse. SL3 aligns with SDGs, while SL1 and SL2 contribute to SDG 2.4.1 on sustainable land management. SL4 and SL5 also address farm output and productivity targets. The five green growth indicators in the **material use efficiency** pillar include material consumption per GDP (ME1), material footprint (ME2), food loss and food waste (ME3), municipal solid waste recycled (ME4), factories with water treatment basins (ME5.a), and factories with hazardous waste disposal (ME5.b). These indicators are minimally integrated into national policies. ME1 and ME2 are only partially discussed, with ME2 critical due to increasing construction demands. Policies like NCCAP cover ME4, ME5.a, and ME5.b, emphasizing waste management infrastructure and hazardous waste disposal. ME1, ME2, and ME3 are SDG indicators, while ME5.a aligns with SDG 6.3.1 on wastewater treatment, and ME5.b supports SDG 12.4.2 on hazardous waste management.

Natural capital protection: The five green growth indicators in the **environmental quality** pillar include PM2.5 air pollution (EQ1), DALY rate from unsafe water (EQ2), number of green industries (EQ3), waste collection coverage (EQ4), and factories with air filtration (EQ5). While these indicators are only implicitly mentioned in national policies, EQ1 is highlighted in the NSEDP and sectoral policies (e.g., Clean Energy Promotion Policy, and Green Industry Policy) advocating for air pollution control technologies. EQ2 appears in the NGGS, NCCAP, and Vision 2035, addressing water quality treatment. Green industry promotion (EQ3) is supported by the NSEDP and sectoral policies encouraging energy-efficient investments. EQ4, the most discussed indicator, is referenced in the NSEDP, NGGS, and explicitly in the 10-year Natural Resources and Environment Strategy. Waste collection coverage was reported at 36 percent in 2022. Only EQ1 is an SDG indicator, while EQ2 supports SDG 3.9.2 on water-related mortality, EQ3 aligns with SDG 9.4.1 on CO_2 emissions from manufacturing, and EQ5 contributes to SDG 11.6.2 on particulate matter in cities. The **GHG emissions reduction** pillar's five green growth indicators include CO_2 emissions per capita (GE1), non-CO_2 per capita excl. AFOLU (GE2), non- CO_2 emissions in AFOLU (GE3), carbon intensity of energy production (GE4), and CO_2 absorbed by forests (GE5). GE5 is the most prominent, explicitly mentioned in the GCF and implicitly in the NSEDP and NGGS, emphasizing forests' role in carbon sequestration. GE1, GE2, and GE3 are discussed in NGGS and GCF, detailing emission trends and mitigation goals. Lao PDR achieved a 34 percent reduction in emissions compared to baseline scenarios, as reported in the NDC. GE1, GE2, and GE3 are SDG indicators included in the Global Green Growth Index, while GE4 and GE5 align with SDG 13.2.2 on total GHG emissions. The five green growth indicators in the **biodiversity and ecosystem protection** pillar include protected key biodiversity areas (BE1), share of forest areas (BE2), forest above-ground biomass (BE3),

forest under certification scheme (BE4), and change in extent of water ecosystems (BE5). BE2 is the most frequently mentioned, appearing explicitly in all national policies except NCCAP. The NSEDP aims to increase forest cover to 70 percent by 2025. BE5 is highlighted in the 2030 Vision and NBSAP, which values wetlands at over $101 million annually. BE1 is discussed in the 2030 Vision and 10-year Natural Resources Strategy, targeting the management of 50 percent of protected areas. BE3 is absent from national policies. All indicators align with SDGs, with BE1 and BE2 also included in the Global Green Growth Index. The five green growth indicators in the **cultural and social value** pillar include the red list index (CV1), terrestrial protected areas (CV2), green hotel standard (CV3), number of tourists visiting natural, cultural, and historical sites (CV4), and number of clean tourist cities (CV5). CV1 is explicitly mentioned in the NBSAP and implicitly in the NSEDP. Tourism, contributing 12 percent to GDP pre-pandemic, is highlighted in the 2030 Vision for promoting cultural and natural heritage sites. CV4 appears in the 2030 Vision and NBSAP, while CV3 discusses green tourism standards in the NGGS. CV2 and CV5 are referenced in the 10-year Natural Resources Strategy. CV1 and CV2 are SDG indicators, while CV3, CV4, and CV5 align with SDG 8.9.1 on sustainable tourism's contribution to GDP.

Green economic opportunities: The five green growth indicators in the **green investment** pillar include government expenditure and Official Development Assistance (ODA) on sustainable tourism (GV1), integrated water resources management implementation, financing (GV2), revenue from biodiversity-relevant economic instruments (GV3), government expenditure on agriculture (GV4), and government expenditure on natural resources and environment (GV5). Of these, only GV5 is mentioned in national policies, with the NBSAP highlighting industries' user fees to support biodiversity conservation through funds like the Environmental Protection Fund. GV4 is noted in sectoral policies, with GSAF encouraging private investment in agriculture and rural development. GV1, GV2, and GV3 are not mentioned in policies but contribute to SDGs: GV2 aligns with SDG 6.5.1 on integrated water management, GV1 with SDG 8.9.1 on sustainable tourism, GV4 with SDG 2.a.1 on agriculture spending, and GV5 broadly supports SDG 15 on ecosystem protection. None are part of the Global Green Growth Index. The five green growth indicators in the **green trade** pillar include exports of environmental goods (GT1), medium and high-tech exports (GT2), ISO 14001 certificates issued (GT3), import dependency in renewables (GT4), and agricultural raw material exports (GT5). Only GT4 and GT5 appear in national policies, with GT4 emphasizing electricity exports to neighboring countries and GT5 highlighting trade agreements like duty-free market access to Europe. Challenges such as low productivity and natural disasters limit export potential. GT3 is discussed in sectoral policies like the Green Industry Policy, focusing on ISO 14001 standards. GT1 and GT2 are absent from policies. GT1 supports SDG 17.7.1 on environmental technologies, while GT4 aligns with SDG 7.b.1 on renewable energy capacity. GT1 is part of the Global Green Growth Index. The five green growth indicators in the **green employment** pillar include

green employment in manufacturing (GJ1), employed below the poverty line (GJ2), vulnerable employment (GJ3), Youth not engaged in education, employment, or training (NEET) rate (GJ4), and ODA flows for scholarships (GJ5). Only GJ1 and GJ4 are in the NSEDP, with GJ4 explicitly mentioned as part of efforts to create sustainable jobs in eco-tourism and organic farming. GJ2, GJ3, and GJ5 are absent from national policies, though GJ4 is supported in the Decent Work Country Programme, which emphasizes vocational training and better working conditions. GJ2, GJ4, and GJ5 align with SDGs such as 8.6.1 on NEET youth, while GJ1 supports SDG 9.2.2 on manufacturing employment. Only GJ1 is part of the Global Green Growth Index. **Green innovation:** The five green growth indicators in this pillar include environmental technologies (GN1), scientific and technical journals (GN2), renewable electricity capacity (GN3), medium/ high-tech manufacturing value-added (GN4), university-industry collaboration in R&D (GN5). GN3 is the most mentioned, appearing in all national policies, with goals to achieve 13 GW of hydropower and expand solar, wind, and biomass capacity by 2030. GN1 is promoted in the NGGS for clean and efficient technologies. GN2 appears in the NGGS, supporting research initiatives by the Ministry of Science and Technology. GN4 and GN5 are absent from policies. GN3 and GN4 align with SDGs 7.b.1 on renewable capacity and 9.5.1 on R&D expenditure, while GN1 supports SDG 17.7 on environmental technology dissemination. Only GN3 is part of the Global Green Growth Index.

Social inclusion: The five green growth indicators in the **access to basic services and resources** pillar include access to safe water (AB1.a), access to sanitation (AB1.b), access to electricity (AB2), prevalence of underweight (AB3.a), prevalence of stunting (AB3.b), proportion of paved roads (AB4), property rights (AB5). Most indicators are included in national policies, with AB1.a and AB1.b explicitly mentioned in NGGS, NDC, and other plans like Vision 2035. AB2 and AB3 are explicitly referenced in NSEDP and NGGS, while AB4 is noted in NGGS for reducing urban dust and respiratory issues through paved roads. AB5 is not included in national policies. Key indicators like AB1, AB2, and AB3 align with SDGs, while AB4 links to SDG 9.1.1 on road access, and AB5 relates to SDG 1.4.2 on secure land tenure. AB1.a, AB1.b, and AB2 are also part of the Global Green Growth Index. The five green growth indicators in the **gender balance** pillar include women in national parliaments (GB1), equal gender pay (GB2), births attended by skilled attendants (GB3), mother and early childhood grant (GB4), and school enrollment gender parity (GB5). GB1, GB3, and GB5 are explicitly mentioned, with GB1 targeting at least 30% female representation in government assemblies. GB3 has shown significant progress, increasing from 42% in 2012 to 72.8% in 2020. GB2 is discussed in the Health Sector Reform Strategy, promoting gender equity among health workers, while GB4 is absent in policies. GB1 and GB3 are SDG indicators, while others support goals like SDG 8.5.1 (equal pay) and SDG 4.5.1 (gender parity in education). The indicators GB1 and GB2 are part of the Global Green Growth Index. **Social equity:** The five green growth indicators in this pillar include inequality in income (SE1), urban-rural access to electricity (SE2.a), urban-rural access to safe water (SE2.b), urban-rural access to sanitation (SE2.c), youth unemployment disparity (SE3), age dependency ratio (SE4), and cash benefit for people with disabilities (SE5). SE1 and SE2 are mentioned in NSEDP and NGGS, highlighting urban-rural income gaps. SE2.c appears in the NDC and water and sanitation strategies, while SE3 and SE4 are in policies like the 2030 Vision and GCF. SE5 is absent from policies. SE2, SE3, and SE5 are SDG indicators, while SE1 supports SDG 10.4.2 (fiscal policy redistribution), and SE4 aligns with SDG 1.3.1 (social protection coverage). SE1 is part of the Global Green Growth Index. The five green growth indicators in the **social protection** pillar include old people receiving a pension (SP1), universal health coverage (SP2), average life expectancy (SP3), victims of intentional homicides (SP4), and implementing local disaster risk reduction strategies (SP5). SP2 and SP3 are explicitly included in NSEDP and sectoral plans, with SP2 highlighting free healthcare for vulnerable groups and UHC implementation. SP5 is indirectly mentioned in NSEDP for disaster preparedness and insurance. SP1 and SP4 are not referenced in policies. All but SP3 are SDG indicators, with SP3 contributing to SDG 3.8.1 (essential health services). Only SP2 is part of the Global Green Growth Index.

Table 4 also presents the data sources for the 80 green growth indicators (see Table footnote for the definitions of the data source acronyms). Approximately 57 percent of the **efficient and sustainable resource use** indicators were drawn from national databases provided by line ministries (i.e., MEM, MPI, MAF, MOIC, and LSB). This dimension includes eight SDG indicators. For SDG indicators like

Table 4. Green growth indicators selected by the national experts for the Green Growth Index, by dimensions and pillars

Code	Indicator name	Unit	Publisher	SDG
EFFICIENT AND SUSTAINABLE RESOURCE USE				
EE1	Ratio of total primary energy supply to GDP, or energy intensity level of primary energy	Megajoules per constant 2017 purchasing power parity GDP	IEA	✓
EE2	Share of renewable to total final energy consumption (hydro, solar, wind, biomass, biogas)	Percent	IEA	✓
EE3	Efficiency in sustainable transport: Logistics performance index - Frequency with which shipments reach consignee within scheduled or expected time	Score	WB	
EE4	Share of renewable energy production to total energy production (Hydro, Solar, Wind, Biofuels and waste)	Percent	IEA	

Table 4. Green growth indicators selected by the national experts for the Green Growth Index, by dimensions and pillars *(continued)*

Code	Indicator name	Unit	Publisher	SDG
EE5	Low-carbon electricity generation by source (Hydro, Wind, Solar, Biomass)	Gwh	MEM	
EW1	Water use efficiency (agriculture)	m^3 per US dollar	MPI	
EW2	Share of freshwater withdrawal to available freshwater resources (Level of water stress) including surface and underground water	Percent	FAO	✓
EW3	Share of fisheries to GDP	GDP Ratio	MPI	
EW4	Irrigation water consumption in agricultural sector	million m^3	MAF	
EW5	Total renewable freshwater resources per capita	m^3/inhab/year	FAO	
SL1	Soil nutrient budget	Nitrogen kilogram per hectare	FAO	
SL2	Share of agriculture organic to total agriculture land area	Percent	MAF	
SL3	Proportion of land that is degraded over total land area	Percent	MAF	✓
SL4	Average productivity of rice (wet and dry season)	Ton/ha	MAF	
SL5	Production levels to meet food security and products for export	Tonnes	LSB	
ME1	Total domestic material consumption (DMC) per unit of GDP	kg/USD	MPI	✓
ME2	Total material footprint (MF) per capita population	Tonnes per capita	UNEP	✓
ME3	Share of food loss to production	Percent	MAF	✓
ME4	Amount of municipal solid waste recycled	Percent	WB	✓
ME5	Percentage of industrial factories that have water treatment basins and hazardous waste disposal and treatment	Percent	MOIC	
ME5.a	Percentage of industrial factories that have water treatment basins	Percent	MOIC	
ME5.b	Percentage of industrial factories that have hazardous waste disposal and treatment	Percent	MOIC	
NATURAL CAPITAL PROTECTION				
EQ1	$PM_{2.5}$ air pollution	Micrograms per cubic meter	Brauer et al. 2017, WB	✓
EQ2	DALY rate due to unsafe water sources	DALY lost per 100,000 persons	IHME	
EQ3	Number of green industries	Number	MOIC	
EQ4	Waste collection coverage total households	Percent	MPWT	
EQ5	Industrial factories with air filtration that meet environmental standard	Percent	MOIC	
GE1	Ratio of CO_2 emissions to population, including AFOLU	Tons per capita	CW, WB	✓
GE2	Ratio of non-CO_2 emissions (CH4, N2O) excluding AFOLU to population	CO_2eq tonnes per capita	CW, WB	✓
GE3	Ratio of non-CO_2emissions (CH_4 N_2O and F-gas) in Agriculture and LUCF to population	CO_2eq tonnes per capita	CW, WB	✓
GE4	Carbon intensity of energy generation	kg of CO_2eq per kilowatt-hour	GCB, EIA, BP	
GE5	CO_2 absorbed by forests	Tonnes Co_2eq per year	MAF	
BE1	Average proportion of Key Biodiversity Areas covered by protected areas	Percent	IUCN, UNEP-WCMC	✓
BE2	Share of forest area to total land area	Percent	MAF	✓

Table 4. Green growth indicators selected by the national experts for the Green Growth Index, by dimensions and pillars *(continued)*

Code	Indicator name	Unit	Publisher	SDG
BE3	Above-ground biomass stock in forest	Tonnes	MAF	✓
BE4	Share of forest area under an independently verified forest management certification scheme	Thousands of hectares	FAO	✓
BE5	Change in the extent of water related ecosystems over time: Lakes and rivers permanent water area (% of total land area)	Percent	UNEP	✓
CV1	Red list index	Score	FAO	✓
CV2	Share of protected areas to total territorial areas	Percent	MAF	✓
CV3	Green Hotel Standard	Number	MoICT	
CV4	Number of tourists visiting natural, cultural and historical sites	Number	MoICT	
GREEN ECONOMIC OPPORTUNITIES				
GV1	Government expenditure on the development of sustainable tourism. Including government and ODA	million kip	MoICT	
GV2	Degree of integrated water resources management implementation, financing	Percent	UNEP	✓
GV3	Revenue generated and finance mobilized from biodiversity-relevant economic instruments	millions of constant 2020 United States dollars	OECD	✓
GV4	Government expenditure on agriculture	million kip	MPI	
GV5	Government expenditure on natural resources and environment	million kip	MPI	
GT1	Share of environmental products export compared to the total export	Percent	UN-COMTRADE	
GT2	Medium and high-tech exports	Percent	UNIDO	
GT3	Number of ISO 14001 certificates to total number of ISO certificates, which specifies requirement for environmental management	Percent	ISO	
GT4	Import dependency ratio Note: Limited to (hydro, solar, wind, biomass)	Ratio	MEM	
GT5	Agricultural raw materials exports	Percent	WB	
GJ1	Share of green employment in total manufacturing employment	Percent	UNIDO	
GJ2	Employed population below international poverty line	Percent	ILO	✓
GJ3	Vulnerable employment, total	Percent	MoLSW	
GJ4	Share of youth (aged 15-24 years) not in education, employment or training	Percent	MoLSW	✓
GJ5	Volume of official development assistance flows for scholarship per capita	millions of constant 2020 United States dollars per capita	OECD	✓
GN1	Development of environment-related technologies	Percent	OECD	
GN2	Annual articles published in scientific and technical journals per million people	Number per million people	WB	
GN3	Installed renewable energy-generation capacity	watts per capita	IRENA	✓
GN4	Proportion of medium and high-tech industry value added in total value added	Percent	UNIDO	✓
GN5	University-industry collaboration in Research & Development	Score	WEF	
SOCIAL INCLUSION				
AB1	Share population with access to clean water and sanitation	Percent	MPI	✓
AB1.a	Share of population with access to clean water	Percent	MPI	✓

Table 4. Green growth indicators selected by the national experts for the Green Growth Index, by dimensions and pillars *(continued)*

Code	Indicator name	Unit	Publisher	SDG
AB1.b	Share of population with access to sanitation	Percent	MPI	✓
AB2	Population with access to electricity	Percent	MEM	✓
AB3	Malnutrition of children under 5 (underweight and stunting)	Percent	MOH	✓
AB3.a	Underweight children under 5 years old	Percent	MOH	✓
AB3.b	Stunted children under 5 years old	Percent	MOH	✓
AB4	Proportion of paved roads to total national road network	Percent	MPWT	
AB5	Property Rights Score	Score	Heritage Foundation	
GB1	Proportion of seats held by women in national parliaments	Percent	LWU	✓
GB2	Getting paid, laws and regulations for equal gender pay	Score	WB	
GB3	Percentage of births attended by Skilled birth attendants	Percent	MOH	✓
GB4	Mother and early childhood grant (compared to total recent pregnant women)	Percent	MoLSW	
GB5	School enrollment, primary (gross), gender parity index	Index	UNESCO	
SE1	Inequality in income based on Palma ratio	Ratio	WB	
SE2	Population with access to basic services by urban/rural, i.e. electricity, clean water, sanitation	Ratio	WB, WHO, UNICEF	✓
SE2.a	Population with access to electricity by urban/rural	Ratio	WB	✓
SE2.b	Population with access to safely managed water by urban/rural	Ratio	WHO, UNICEF	✓
SE2.c	Population with access to safely managed sanitation by urban/rural	Ratio	WHO, UNICEF	✓
SE3	Disparity of unemployment: Ratio of Youth (15-24 years old) and above 25 years old unemployment	Ratio	MoLSW	✓
SE4	Age dependency ratio, old	Percent	WB	
SE5	Proportion of population with severe disabilities receiving disability cash benefit	Percent	ILO	✓
SP1	Proportion of population above statutory pensionable age receiving a pension	Percent	ILO	✓
SP2	Universal health coverage (UHC)	Percent	WHO	✓
SP3	Average life expectancy	Years	MOH	
SP4	Number of victims of intentional homicide per 100,000 population	Number	MoPS	✓
SP5	Proportion of local governments that adopt and implement local disaster risk reduction strategies (provincial)	Percent	MoLSW	✓

Definitions: International Energy Agency (IEA), World Bank (WB), Ministry of Energy and Mines (MEM), Ministry of Planning and Investment (MPI), Food and Agriculture Organization (FAO), Ministry of Agriculture and Forestry (MAF), Lao Statistics Bureau (LSB), United Nations Environment Programme (UNEP), Ministry of Industry and Commerce (MOIC), Institute for Health Metrics and Evaluation (IHME), Ministry of Public Works and Transport (MPWT), Climate Watch (CW), Global Carbon Budget (GCB), U.S. Energy Information Administration (EIA), BP and Shift Energy Data Portal (BP), International Union for Conservation of Nature (IUCN), UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), Ministry of Information, Culture and Tourism (MoICT), Organization for Economic Cooperation and Development (OECD), United Nations Commodity Trade Statistics Database (UN COMTRADE), United Nations Industrial Development Organization (UNIDO), International Organization for Standardization (ISO), International Labour Organization (ILO), Ministry of Labour and Social Welfare (MoLSW), International Renewable Energy Agency (IRENA), World Economic Forum (WEF), Ministry of Health (MOH), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), Ministry of Public Security (MoPS)

EE1, EE2, and EW2, data were sourced from the UNSTATS SDG database, which offers better time-series data than national databases. Meanwhile, data for the remaining SDG indicators, including EW1, SL3, and ME1, were obtained from national sources. Other indicators, such as EE3, EE4, EW5, SL1, ME2, and ME4, relied on international databases (e.g., IEA, FAO, and World Bank). About half of the indicators in the **natural capital protection** dimension were provided by line ministries such as the MPWT, MoICT, MOIC, and MAF. Nine indicators are SDGs, with four sourced from the UNSTATS database. The remaining SDG indicators were collected from international databases (e.g., World Bank, IHME, ClimateWatch), which provide better time-series coverage. The **green economic opportunities** dimension has the fewest SDG indicators, with seven in total. Data for most of these SDG indicators were sourced from the UNSTATS database, except for GJ4, which was provided by the MoLSW. Additional data for six indicators, including GV1, GV4, GV5, GT4, GJ3, and GJ4, were supplied by the MoICT, MPI, and MEM. For the remaining indicators, data were obtained from international sources such as the World Bank, ISO, UNIDO, and OECD due to limited national data relevant to green economic opportunities. The **social inclusion** dimension also has the largest number of SDG indicators, including composite indicators such as AB1 (comprising AB1.a: access to safe water and AB1.b: access to sanitation), AB3 (comprising AB3.a: prevalence of underweight and AB3.b: prevalence of stunting), and SE2 (comprising urban-rural access to electricity, safe water, and sanitation). Many SDG indicators in this dimension are already being reported by line ministries, including the MOH, LWU, MoPS, MPI, MEM, and MoLSW. For four other SDG indicators—SE2, SE5, SP1, and SP2—data were sourced from the UNSTATS and WHO databases, offering better time-series coverage.

Figure 30 provides a detailed overview of the data availability for Lao PDR's green growth indicators across pillars in the four dimensions: efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. The gray bars in the figure represent the percentage of data gaps, highlighting areas requiring further data collection and improvement. The **efficient and sustainable resource use** dimension demonstrates moderate data availability, with pillars like energy efficiency (EE) and water efficiency (EW) showing data coverage of 69 and 71 percent, respectively. However, significant data gaps exist for material efficiency (ME, 65 percent) and sustainable land use (SL, 48 percent), which are critical for monitoring progress in sustainable resource management. The higher availability of data for energy and water indicators reflects stronger reporting mechanisms, but improvements are needed for land and material efficiency metrics. Indicators across pillars in the **natural capital protection** dimension have variable data availability. biodiversity and ecosystem protection (BE) and GHG emissions reduction (GE) show strong data coverage at 62 and 85 percent, respectively, indicating consistent monitoring of these areas. However, cultural and social value (CV) and environmental quality (EQ) have substantial data gaps, with 60 and 65 percent missing data. The low data availability for these indicators highlights the need to strengthen monitoring and reporting systems for natural capital indicators.

The **green economic opportunities** dimension exhibits the largest data gaps, with only green trade GT) showing high availability at 82 percent. Indicators such as green employment (GJ) and green investments (GV) show significant data gaps of 62 and 55 percent, respectively, while green innovation (GN) performs slightly better with 58 percent data coverage. The limited data availability in this dimension underscores the challenges Lao PDR faces in tracking progress in green economic opportunities and the need for targeted efforts to improve data collection and reporting in this area. Social Inclusion The **social inclusion** dimension shows relatively strong data availability for several indicators. Social equity (SE) has the highest data availability at 77 percent, reflecting robust reporting on equity-related issues. However, significant gaps remain for indicators such as social protection (SP, 66 percent) and access to basic services (AB, 52 percent). These gaps highlight the need for

Figure 30. Design process for the Lao PDR Green Growth Index

further efforts to monitor access to services and protection for vulnerable populations, which are crucial for promoting inclusive growth.

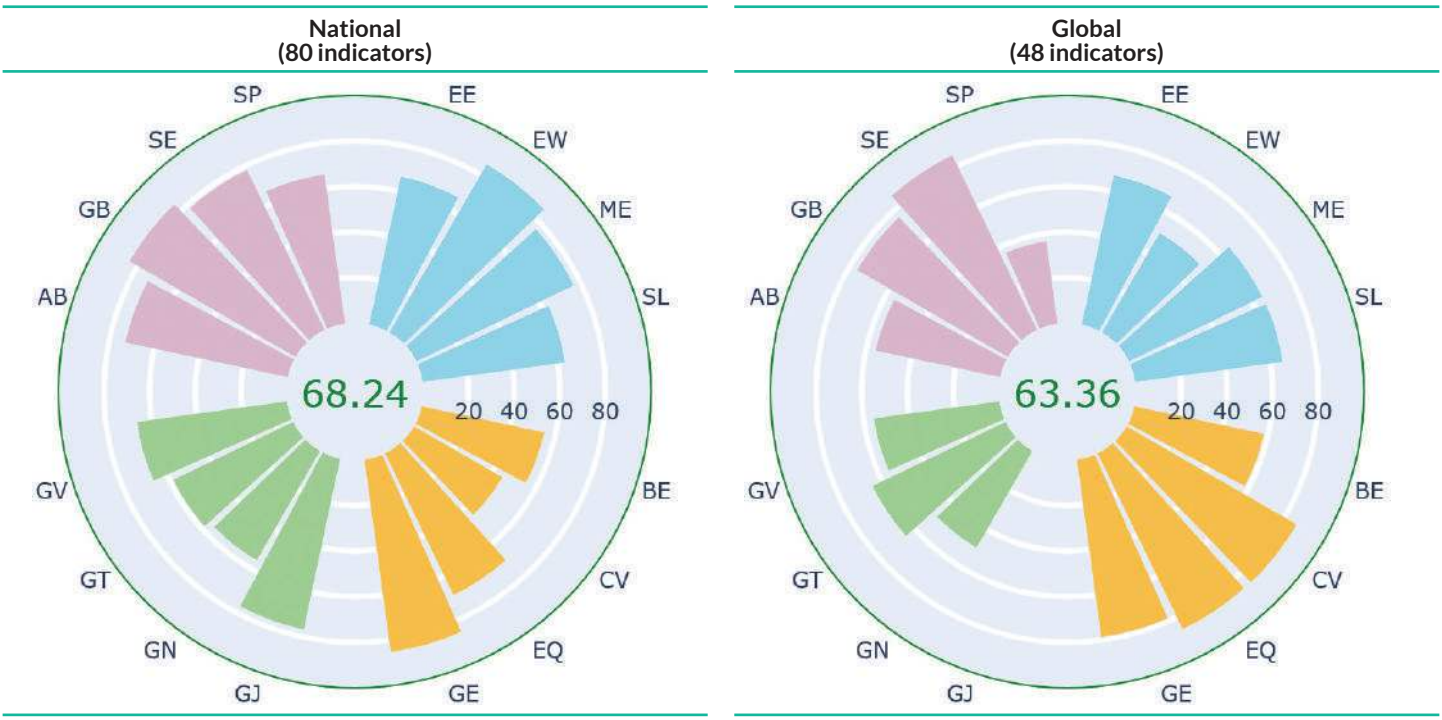
The data availability underscores both strengths and challenges in Lao PDR's green growth monitoring systems. While some dimensions, like energy efficiency and GHG emissions, show relatively robust coverage, others, particularly green economic opportunities and natural capital protection, face substantial gaps. Closing these data gaps is critical for enhancing the accuracy and comprehensiveness of the Lao PDR Green Growth Index, enabling more effective policy interventions and progress tracking. Efforts to address these gaps should focus on strengthening national data collection systems, increasing collaboration with international databases, and building the data collection capacity of relevant institutions.

5.5 Green growth performance

5.5.1 Distance to targets

This section discusses Lao PDR's progress toward green growth targets. Figure31 presents the circular diagrams, with bar lengths indicating proximity to goals—longer bars signify closer achievement, while shorter bars reveal areas needing improvement. The comparison between Lao PDR's national (80 indicators) and global (40 indicators) Green Growth Index scores reveals key similarities and differences. While the overall Index scores are relatively close—68.24 for the national and 63.36 for the global Green Growth Index—the pillar scores diverge significantly. This variation arises for two main reasons: First, only a portion of the global Green Growth Index indicators is represented in the national Index, which emphasizes indicators tailored to Lao PDR's priorities. Second, the targets for non-SDG indicators in the national

Figure 31. Lao PDR's distances to sustainability targets by green growth pillars



Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social inclusion
EE – efficient and sustainable energy EW – efficient and sustainable water use SL – sustainable land use ME – waste and material use efficiency	EQ – environmental quality GE – greenhouse gas emissions reduction BE – biodiversity and ecosystem protection CV – cultural and social value	GV – green investment GT – green trade GJ – green employment GN – green innovation	AB – access to basic services and resources GB – gender balance SE – social equity SP – social protection

Index are based on top-performing ASEAN countries, while the global Index applies more universal benchmarks.

In the national Index, Lao PDR performs well in efficient and sustainable water use (EW) and GHG emissions reduction (GE), with national scores of 85.55 and 85.5, respectively. These pillars reflect strong national policies and resource management efforts, surpassing the global scores of 50.78 and 78.95, respectively. Similarly, Lao PDR's score for gender balance (GB) is high at 84.3 in the national Index, highlighting progress in reducing gender disparities, while the global score is slightly lower at 76.5. However, there are notable gaps in other pillars when compared to global scores. For instance, cultural and social value (CV) scores much lower on the national Index at 45.08 than on the global Index at 86.36, indicating challenges in eco-tourism and conservation financing. Similarly, social protection (SP) scores only 66.32 on the national Index, which is much higher than the global score of 36.75 but still reflects gaps in disaster preparedness and social security programs. Lao PDR's moderate performance in the national Index is reinforced by strong scores in efficient water use (EW), GHG emissions reduction (GE), and gender balance (GB). However, challenges persist in cultural and social value (CV), green innovation (GN), and green trade (GT), with national scores of 45.08, 55.78, and 58.68, respectively. Green trade performance is particularly constrained by limited environmental exports and high-tech industries. Addressing these gaps through targeted investments in eco-tourism, green manufacturing, and technological innovation could significantly improve Lao PDR's overall green growth performance

5.5.2 Green growth trends

This section discusses the Green Growth Index for Lao PDR at both national and global levels from 2010 to 2022. Figure 32 shows a positive upward trend, indicating consistent improvements in green growth performance over time. The scores from the national Index are consistently higher than the global Index, with a difference ranging from 7.26 points in 2010 to 4.9 points in 2022. This disparity reflects the stronger alignment of the national Index indicators with Lao PDR's specific priorities and contexts compared to the broader, globally standardized framework. Regarding the national Index, Lao PDR's performance improved steadily from 64.91 in 2010 to 68.24 in 2022, representing a 5.14 percent increase over the 12-year period. The global Index increased from 57.65 in 2010 to 63.34 in 2022, a 9.85 percent increase, reflecting a stronger relative improvement. The most significant annual increase occurred between 2020 and 2021 in both the national and global indices. The higher scores in the national Index demonstrate the importance of context-specific indicators that reflect Lao PDR's unique economic, social, and environmental challenges. These scores indicate relatively strong performance in areas such as efficient and sustainable resource use and natural capital protection, which are more comprehensively captured in the Lao PDR's national framework. The lower global Index scores suggest areas where Lao PDR's performance is measured against global sustainability standards, highlighting potential gaps in achieving globally recognized targets. These gaps can be attributed to using different sets of green growth indicators and alignment with global benchmarks.

Figure 33 compares the scores for efficient and sustainable resource use, green economic opportunities, natural capital protection, and social inclusion for Lao PDR at the national level and within the global framework from 2010 to 2022. The comparison between Lao PDR's national and global Index scores across the four dimensions reveals significant trends and insights. Lao PDR's national scores consistently outperform global scores in social inclusion and efficient and sustainable resource use while facing

Figure 32. Trend in the Green Growth Index in Lao PDR, 2010-2023

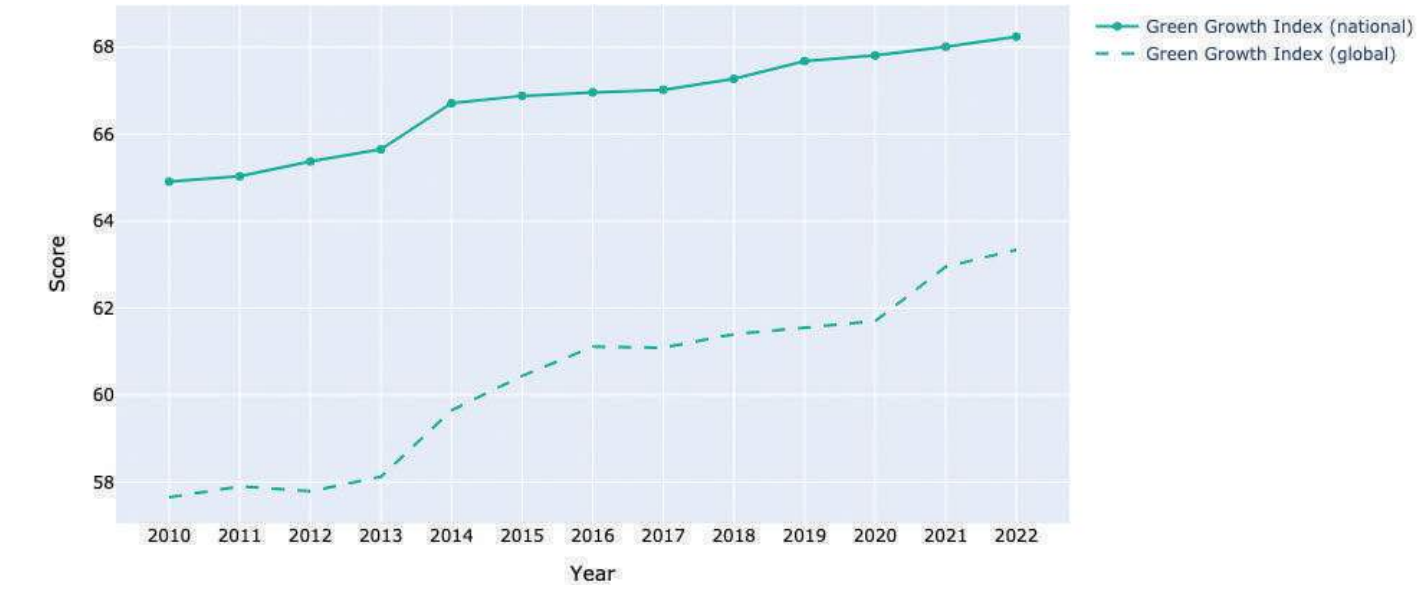


Figure 33. Trend in the green growth dimensions in Lao PDR, 2010-2023

challenges in aligning with global performance in natural capital protection. National scores in efficient and sustainable resource use increased from 67.33 in 2010 to 72.61 in 2022, consistently exceeding global scores, which fluctuated and slightly declined from 63.5 to 61.78 over the same period. In green economic opportunities, national scores improved from 56.71 in 2010 to 64 in 2022, while global scores saw a steeper rise from 41.78 to 56.3. The narrowing gap indicates that Lao PDR is increasingly aligning its economic strategies with global green growth priorities, although challenges remain in enhancing renewable energy and green trade. However, natural capital protection remains a critical challenge for Lao PDR. National scores peaked at 68.33 in 2014 but have since declined to 62.02 in 2022, while global scores rose steadily from 73.1 to 76.37. This widening gap underscores the need for more robust policies in biodiversity conservation and deforestation management. Lao PDR's greatest strength lies in social inclusion, with national scores improving from 68.9 in 2010 to 75.23 in 2022, consistently outperforming global averages, which rose more modestly from 56.97 to 60.58. This reflects significant progress in education, access to services, and gender equality. Overall, while Lao PDR demonstrates strong performance in areas specific to its context, such as social Inclusion and efficient and sustainable resource use, further efforts are needed to address gaps in natural capital protection and sustain progress in green economic opportunities.

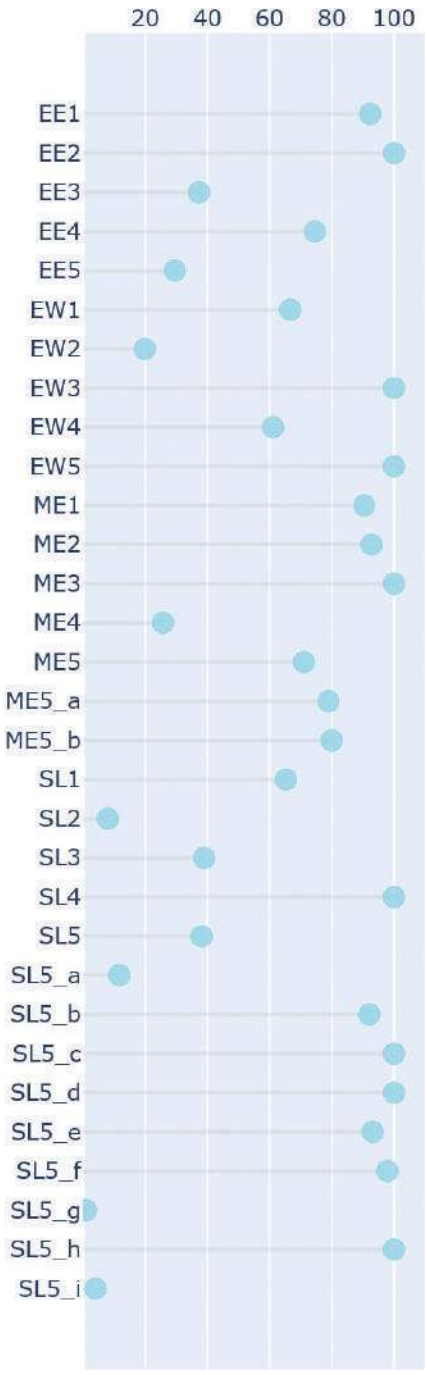
5.5.3 Green growth scores

This section provides an in-depth analysis of the scores of various green growth indicators across the four dimensions, offering insights into Lao PDR's performance. It highlights the areas where the country demonstrates strong progress, showcasing effective policies and initiatives contributing to these successes. Additionally, it identifies indicators where significant gaps remain, emphasizing the need for targeted interventions and investments to address challenges and accelerate Lao PDR's green growth transition.

Efficient and Sustainable Resource Use

Figure 34 presents the efficient and sustainable resource use indicators by pillars. In the **efficient and sustainable energy** pillar, energy efficiency scored 66.75 in 2022, with notable achievements in renewable energy share (EE2, 100) and energy intensity (EE1, 92.35). These strengths reflect Lao PDR's progress in promoting renewable energy, supported by Nationally Determined Contributions (NDC) targets, which aim for 30% renewable energy by 2030. However, transport efficiency (EE3) and low-carbon electricity (EE5) lag behind, scoring lower due to limited electrification of transport systems and continued reliance on traditional energy sources. Inadequate infrastructure for clean energy and limited investments in sustainable transport hinder progress in this pillar. To address these gaps, Lao PDR should focus on expanding clean energy infrastructure, implementing incentives for low-carbon transport, and enhancing access to electrified public transport systems. Lao PDR's **efficient and sustainable water use** pillar is the strongest in the ESRU dimension, scoring 85.55 in 2022. Indicators such as water stress (EW2), fisheries contribution to GDP (EW3), and renewable water resources per capita (EW5) scored 100, reflecting robust policies on water management and aquaculture development. These strengths are attributed to integrating water resource sustainability in the National Socio-Economic Development Plan (NSEDP) and the National Green Growth Strategy (NGGS). However, challenges remain in water efficiency (EW1) and irrigation for agriculture (EW4), which scored lower due to insufficient investment in irrigation systems and frequent disruptions caused by natural disasters like floods and droughts. To sustain progress, Lao PDR must prioritize modernizing irrigation infrastructure and integrating disaster-resilient practices into water management policies. The **material use efficiency** pillar scored 76 in 2022, driven by strong performance in material consumption per GDP (ME1) and material footprint (ME2). These results highlight Lao PDR's efforts to promote sustainable material use

Figure 34. Scores for the efficient and sustainable resource use indicators in the in Lao PDR, 2022



Efficient and sustainable energy (EE): EE1 - Energy intensity, EE2 - Renewable energy share, EE3 - Efficient transport, EE4 - Low-carbon electricity, EE5 - Per capita electricity consumption (Kenya), Electricity transmission losses (Ghana)
Efficient and sustainable energy (EW): EW1 - Water use efficiency, EW2 - Level of water stress, EW3 - Sustainable fisheries, EW4 - Share of surface irrigation, EW5 - Renewable water resources per capita
Waste and material use efficiency (ME): ME1 - Material consumption per GDP, ME2 - Material footprint, ME3 - Food loss and food waste, ME4 - Municipal solid waste recycled, ME5 - Wastewater treatment facilities (Kenya), Ratio treated municipal wastewater
Sustainable land use (SL): SL1 - Soil nutrient balance, SL2 - Organic agriculture area, SL3 - Share ruminant livestock, SL4 - Agricultural productivity, SL5 - Farm machinery per unit land

through policies encouraging a circular economy and the 3Rs (Reduce, Reuse, Recycle). However, municipal waste recycling (ME4) is a key weakness, with a score of only 25.75, reflecting the lack of recycling infrastructure and limited public awareness. Industrial waste treatment (ME5) also faces gaps in implementation due to insufficient technical capacity and resources. Addressing these challenges requires scaling up recycling facilities, investing in industrial waste treatment technologies, and conducting public awareness campaigns to increase participation in sustainable material use practices. The **sustainable land use** pillar scored the lowest among ESRU dimensions, with a score of 57.01 in 2022. High performance in soil nutrient balance (SL1) and rice productivity (SL4), both scoring 100, indicates progress in implementing sustainable agricultural practices and achieving productivity targets outlined in the NSEDP and NGGS. However, organic agriculture (SL2) scored poorly at 8.03, reflecting limited adoption of organic farming practices due to market constraints and a lack of technical support for farmers. Similarly, degraded land restoration (SL3) scored 38.96, indicating significant challenges in addressing land degradation. These weaknesses are exacerbated by deforestation and unsustainable land practices. Addressing these issues will require promoting organic farming through market incentives and targeted training programs, along with investments in land restoration and reforestation initiatives.

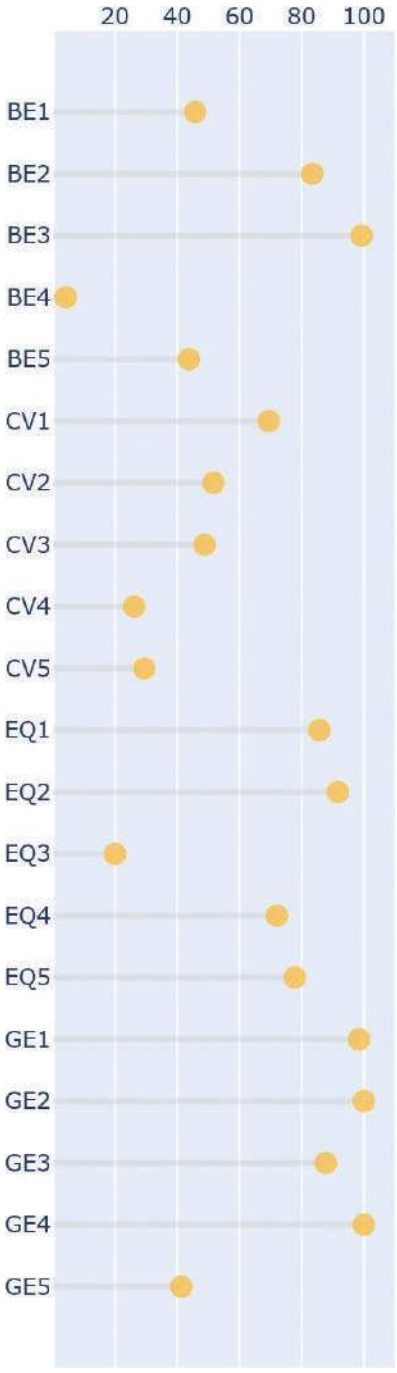
Summary: Lao PDR strongly performs in renewable energy, water resource sustainability, and biodiversity conservation. High scores in renewable energy share and water management reflect the success of policies under the National Green Growth Strategy (NGGS) and Nationally Determined Contributions (NDCs). Efforts in biodiversity conservation, including protected areas and soil nutrient balance, further highlight the country's commitment to preserving natural resources. However, challenges persist in waste recycling, low-carbon electricity, organic farming, and land restoration. Limited recycling facilities and reliance on traditional energy sources hinder progress, while low organic farming adoption and inadequate land restoration efforts impact agricultural sustainability. To address these gaps, Lao PDR must prioritize enhancing waste management and clean energy infrastructure, expanding recycling programs, and promoting renewable electricity. Supporting market-driven organic farming through technical and financial incentives, alongside investments in reforestation and land restoration, will strengthen climate resilience and advance green growth.

Natural Capital Protection

Figure 35 presents the natural capital protection indicators by pillars. This **biodiversity and ecosystem protection** pillar achieved a moderate score of 55.26, with high performance in forest biomass (BE3, 99.29) and forest area share (BE2, 83.36), reflecting ongoing efforts to protect forest ecosystems. Policies under the 2030 Vision emphasize reforestation and forest conservation, which have contributed to these strong scores. However, challenges in protecting biodiversity hotspots (BE1, 45.78) and water ecosystems (BE5, 43.75) persist due to habitat

loss, deforestation, and unsustainable agricultural practices. While efforts to expand protected areas are underway, issues such as insufficient enforcement, limited funding, and lack of technical capacity hamper progress. Strengthening biodiversity governance, promoting sustainable forest certification, and implementing wetland conservation programs are key to improving performance in this pillar. The **cultural and social value** pillar scored the lowest in the NCP dimension, at 45.08, reflecting significant challenges in leveraging natural and cultural assets for sustainable development. Indicators such as the Red List Index (CV1, 69.43) and protected areas (CV2, 51.64) show moderate progress, while tourist visits to natural and cultural sites (CV4, below 30) remain low. National policies, including the NGGS, highlight the potential of green tourism, but issues like unsustainable tourism practices, inadequate infrastructure, and limited financing for protected areas hinder progress. Addressing these challenges requires targeted investments in eco-tourism initiatives, stricter conservation measures, and enhanced community engagement to promote sustainable use of cultural and natural resources. The **environmental quality** pillar scored moderately at 69.44, with notable strengths in PM2.5 air pollution reduction (EQ1, 91.7) and health outcomes linked to water safety (EQ2, 85.74). These results reflect improved air quality standards and initiatives to provide clean water access. However, challenges in industrial pollution control and outdated waste collection systems, reflected in poor performance for green industries (EQ3, 20) and waste treatment facilities (EQ4), hinder further progress. Policies such as the National Socio-Economic Development Plan (NSEDP) and NGGS emphasize expanding pollution control technologies, but implementation remains inconsistent due to financial and technical barriers. Expanding green industries, upgrading waste infrastructure, and promoting waste separation practices will be critical for addressing these gaps. Lao PDR demonstrates strong performance in **GHG emissions reduction**, with a score of 85.5 in 2022. Indicators such as non-CO_2 emissions excluding AFOLU (GE2) and carbon intensity of energy production (GE4), both scoring 100, highlight the country's commitment to reducing emissions through its National Green Growth Strategy (NGGS) and Nationally Determined Contributions (NDCs). These

Figure 35. Scores for the natural capital protection dimension in the in Lao PDR, 2022



Biodiversity and ecosystem protection (BE): BE1 - Protected key biodiversity areas, BE2 - Share of forest areas, BE3 - Forest above-ground biomass (Kenya), Forest area within legally established PAs (Ghana), BE4 - Forest under certification scheme, BE5 - Change in extent of water ecosystems
Cultural and social value (CV): CV1 - Local breeds risk of extinction (Kenya), Red list index (Ghana), CV2 - Terrestrial protected areas, CV3 - Tourism contribution to GDP (Kenya), International tourism receipts (Ghana), CV4 - Plant genetic resources accessions, CV5 - Share of exports of cultural goods
Environmental quality (EQ): EQ1 - $PM_{2.5}$ air pollution, EQ2 - DALY rate from unsafe water, EQ3 - Solid waste generation (Kenya), Degraded land over total land area (Ghana), EQ4 - Chlorophyll-a deviations, EQ5 - Water with good ambient quality
GHG emissions reduction (GE): GE1 - CO_2 emissions per capita, GE2 - Non-CO_2 per capita excl. AFOLU, GE3 - Non-CO_2 emissions in AFOLU, GE4 - Carbon intensity of energy production, GE5 - CO_2 emissions per manufacturing value-added

successes reflect progress in decarbonizing the energy sector and reducing emissions intensity. However, forest carbon sequestration (GE5, 41.35) reveals gaps in forest governance and carbon market readiness. Rising emissions from energy-intensive sectors further challenge the country's mitigation efforts. To strengthen this pillar, Lao PDR must enhance reforestation initiatives, develop carbon credit frameworks, and scale up sustainable forest management practices.

Summary: Lao PDR demonstrates notable strengths in natural capital protection, particularly in forest conservation, air quality improvement, and GHG emissions reduction. Policy frameworks like the National Green Growth Strategy (NGGS) and Nationally Determined Contributions (NDCs) have driven these achievements. High scores in forest biomass and carbon intensity of energy production reflect efforts to preserve ecosystems and decarbonize energy systems. Additionally, reduced PM2.5 levels highlight progress in addressing the health and environmental impacts of pollution. However, challenges still need to be solved in biodiversity hotspot protection, waste management, and eco-tourism. Habitat loss, deforestation, and limited funding for protected areas hinder conservation efforts, while outdated waste treatment facilities and inadequate waste separation reduce pollution control effectiveness. In eco-tourism, insufficient infrastructure and unsustainable practices limit the sustainable use of cultural and natural resources. To address these issues, Lao PDR must enhance enforcement mechanisms for conservation and pollution regulations. Expanding green financing through public-private partnerships and international support is critical for upgrading waste infrastructure, promoting sustainable tourism, and strengthening biodiversity governance. Investments in eco-tourism, reforestation, and community-based conservation will further close these gaps. Balancing conservation with sustainable economic development will ensure progress in natural capital protection while supporting livelihoods and preserving cultural heritage.

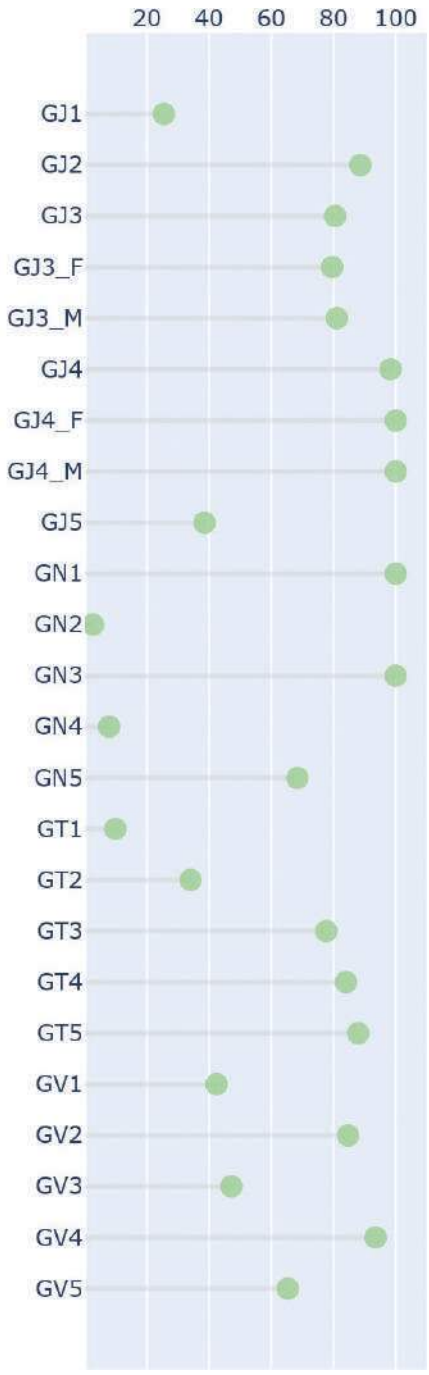
Green Economic Opportunities

Figure 36 resents the green economic opportunities indicators by pillars. **Green employment** achieved a moderate score of 66.3 in 2022, reflecting progress in inclusive employment policies. Indicators such as reducing youth not in employment, education, or training (GJ4, 98.34) and employment below the poverty line (GJ2, 88.63) demonstrate efforts to create opportunities for vulnerable groups. Policies under the National Socio-Economic Development Plan (NSEDP) focus on generating jobs in eco-tourism and organic agriculture. However, green employment in manufacturing (GJ1, 25.47) and development assistance for scholarships (GJ5, 38.5) lag due to limited sectoral strategies and reduced international funding. Barriers include insufficient vocational training programs aligned with green industries and a lack of incentives for employers to transition to sustainable practices. Addressing these gaps requires targeted investment in green skills

training, enhancing access to education, and fostering partnerships with international donors to revitalize scholarship funding. **Green innovation** scored 55.78 in 2022, driven by strong performance in environmental technologies (GN1, 100) and renewable electricity-generating capacity (GN3, 100), reflecting the success of hydropower and renewable energy initiatives. These achievements align with the NGGS's emphasis on clean energy and technological advancement. However, indicators such as scientific and technical journal publications (GN2, below 10) and medium/high-tech manufacturing value-added (GN4, below 10) highlight significant gaps in research and development (R&D) and industrial innovation. Challenges include limited collaboration between universities and industries, insufficient funding for R&D, and weak integration of innovation strategies into sectoral plans. Enhancing investment in R&D, fostering public-private partnerships, and aligning national policies with innovation goals are essential for driving green innovation and accelerating industrial transformation. **Green trade** scored 58.68 in 2022, showcasing strengths in import dependency on renewables (GT4, 84) and agricultural raw material exports (GT5, 87.9). These results highlight Lao PDR's role as a key exporter of sustainable agricultural products, supported by policies like the NSEDP and the National Green Growth Strategy (NGGS). However, the country faces challenges in exporting environmental goods (GT1, 9.84) and medium/high-tech exports (GT2, 34.04), which reflect weak industrial capacity and regulatory frameworks. Barriers include limited investment in research and development (R&D) for green technology and a lack of incentives for businesses to diversify into environmental goods. To address these challenges, Lao PDR must strengthen trade policies that promote environmental goods, improve access to financing for green technology, and build industrial capacity for high-tech manufacturing. **Green investment** scored 66.63 in 2022, reflecting progress in agricultural and biodiversity financing. High-performing indicators include government expenditure on agriculture (GV4, 93.5) and integrated water resources management financing (GV2, 84.7), supported by policies such as the Green and Sustainable Agriculture Framework (GSAF) and the National Biodiversity Strategy and Action Plan (NBSAP). These policies prioritize sustainable agriculture and biodiversity protection, ensuring resource allocation aligns with green growth objectives. However, moderate scores in tourism-related investments (GV1, 42.42) and biodiversity economic instruments (GV3, 47.2) highlight gaps in eco-tourism financing and payment systems for ecosystem services (PES). Challenges include limited institutional capacity to implement PES and inadequate funding for sustainable tourism initiatives. Expanding PES mechanisms, improving financial management, and integrating eco-tourism financing into national planning will strengthen green investment outcomes.

Summary: Lao PDR has demonstrated significant progress in green investment and employment, particularly through its emphasis on sustainable agriculture and inclusive policies. High government expenditure on agriculture and effective financing for integrated water resources management reflect the country's commitment to supporting green

Figure 36. Scores for the green economic opportunities indicators in Lao PDR, 2022



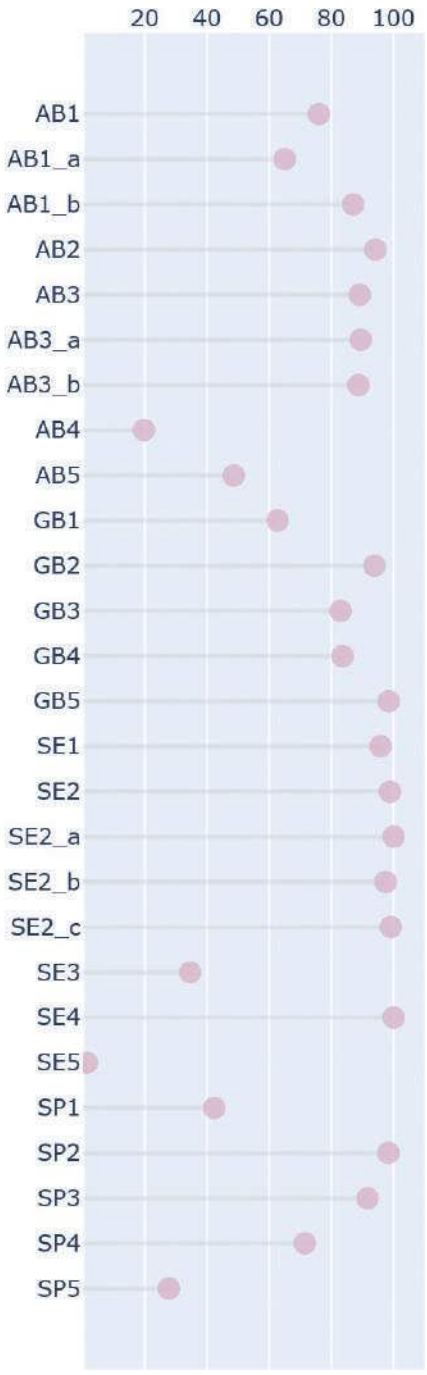
Green employment (GJ): GJ1 - Green employment in manufacturing, GJ2 - Employed people below poverty line, GJ3 - Vulnerable employment, GJ4 - Firms offering formal training, GJ5 - ODA flows for scholarships
Green innovation (GN): GN1 - Environmental technologies, GN2 - Scientific and technical journals, GN3 - Researchers per million inhabitants, GN4 - Medium/ high-tech mfg value-added, GN5 - Trademark applications
Green trade (GT): GT1 - Exports of environmental goods, GT2 - Environmental technologies exported, GT3 - ISO 14001 certificates issued, GT4 - New business density, GT5- High-technology exports
Green investment (GV): GV1 - Adjusted net savings, GV2 - Renewable electricity capacity, GV3 - Financial flows for clean energy R&D, GV4 - Agriculture orientation index, GV5 - Road quality

growth in critical sectors. Similarly, inclusive employment policies have led to improvements in reducing youth unemployment and poverty-level employment, ensuring that green growth benefits reach vulnerable populations. Despite these advances, gaps remain in key areas such as eco-tourism financing, green manufacturing, and research and development (R&D). Limited financial mechanisms for eco-tourism and underdeveloped systems for payments for ecosystem services (PES) hinder efforts to monetize and preserve Lao PDR's rich natural resources. In green manufacturing, low levels of investment and technological capacity prevent the country from fully leveraging opportunities in environmental goods and high-tech exports. Additionally, insufficient support for R&D, including weak collaboration between universities and industries, restricts innovation and the development of green technologies. Addressing these challenges requires targeted interventions. Expanding PES mechanisms can create incentives for conservation while generating additional revenue streams. Promoting green skills training will prepare the workforce for emerging opportunities in sustainable industries, particularly in eco-tourism and manufacturing. Strengthening public-private partnerships and fostering international collaboration can enhance funding and technological capacity, driving innovation and industrial transformation.

Social Inclusion

Figure 37 presents the social inclusion indicators by pillars. **Access to basic services** scored moderately at 73.08, reflecting mixed progress in this pillar. Indicators such as access to electricity (AB2, 94.16) and reducing malnutrition (AB3, 89.1) underscore improvements in universal access and child nutrition, aligning with the NSEDP's development priorities. However, weaknesses persist in access to safe water (AB1.a, 65) and paved road infrastructure (AB4, 19.74), which are constrained by insufficient funding and infrastructure development. Rural areas face significant challenges in achieving equitable access to clean water and transport, limiting opportunities for inclusive growth. Prioritizing investment in water supply systems, sanitation, and rural infrastructure is critical to bridging these gaps and ensuring equitable access to basic services. Lao PDR performed strongly in **gender balance**, scoring 84.3 in 2022. High-performing indicators such as gender parity in school enrollment (GB5, 98.42) and equal pay for men and women (GB2, 93.81) highlight significant progress in reducing gender disparities, particularly in education and the labor market. These achievements are driven by national policies like the 2030 Vision and the National Green Growth Strategy (NGGS), prioritizing women's access to education and fair economic opportunities. However, women's representation in national parliaments (GB1, 62.71) has declined since 2016, reflecting persistent challenges in political inclusion. Efforts to integrate gender equity into leadership roles and decision-making processes, alongside targeted programs to support women's participation in politics, are essential to sustaining progress in this pillar. **Social equity** scored 78.4, with strong results in the age dependency ratio (SE4, 100) and urban-rural access to basic services (SE2, 98.84). These outcomes indicate significant strides in providing

Figure 37. Scores for the social inclusion indicators in Lao PDR, 2022



Access to basic services and resources (AB): AB1 - Access to safe water and sanitation, AB2 - Access to electricity and clean fuels, AB3 - Prevalence of undernourishment, AB4 - Convenient access to public transport, AB5 - Property rights
Gender balance (GB): GB1 - Women in national parliaments, GB2 - Gender account in financial institution, GB3 - Equal gender pay, GB4 - Mothers with maternity cash benefits, GB5 - School enrollment gender parity
Social equity (SE): SE1 - Inequality in income, SE2 - Rural-urban access to electricity, SE3 - Youth unemployment disparity, SE4 - Age dependency ratio, SE5 - Cash benefit for people with disabilities
Social protection (SP): SP1 - Share of old people receiving pension, SP2 - Universal health coverage, SP3 - Population living in slums, SP4 - Victims of intentional homicides, SP5 - Score of Hyogo Framework (Kenya), Implementing local disaster risk reduction strategies (Ghana)

electricity, water, and sanitation across both urban and rural areas, supported by policies like the National Socio-Economic Development Plan (NSEDP). However, gaps remain in youth unemployment disparity (SE3, 34.62) and cash benefits for people with disabilities (SE5, 1.37), revealing a lack of targeted programs and financial resources for vulnerable populations. Limited accessibility and funding for social welfare programs restrict support for individuals with disabilities. Addressing these issues requires expanding financial allocations and implementing inclusive policies that focus on reducing disparities and enhancing social protection.

Social protection scored 66.32 in 2022, demonstrating a moderate level of performance. High scores in universal health coverage (SP2, 98.33) and life expectancy (SP3, 91.67) reflect improved access to healthcare services and expanded insurance coverage, driven by health-related policies under the NSEDP. However, significant gaps exist in disaster risk reduction (SP5, 27.77) and pension coverage for the elderly (SP1, 42.39). Limited funding and policy frameworks for disaster preparedness and aging populations hinder progress in these areas. Strengthening financial support mechanisms, integrating risk reduction strategies into national planning, and ensuring comprehensive pension systems are necessary to enhance resilience and social security for vulnerable groups.

Summary: Lao PDR has made significant strides in social inclusion, particularly in promoting gender equity, expanding access to electricity, and achieving universal health coverage. National policies such as the 2030 Vision and the National Socio-Economic Development Plan (NSEDP) have played a pivotal role in reducing gender disparities, ensuring widespread access to essential services, and improving health outcomes. High levels of gender parity in school enrollment and fair pay reflect the country's commitment to gender equity, while near-universal access to electricity and improved health services underscore progress in infrastructure and public health. However, notable gaps remain, particularly in political inclusion, rural infrastructure, and social welfare programs for vulnerable populations. Women's representation in national decision-making roles remains limited, reflecting broader challenges in achieving gender equity in political leadership. In rural areas, insufficient access to safe water, sanitation, and transport infrastructure constrains opportunities for economic participation and social mobility. Additionally, inadequate funding and limited implementation of social welfare programs leave people with disabilities, the elderly, and other vulnerable groups underserved. To address these challenges, targeted interventions are necessary. Expanding financial resources for rural infrastructure development, such as water systems and transport networks, will be critical to bridging rural-urban disparities. Policies promoting women's leadership and political participation should be strengthened to ensure equitable representation. Furthermore, scaling up social welfare programs and providing targeted support for vulnerable groups, including financial assistance and inclusive service delivery, will enhance social protection.

6 Next steps for the Global Green Growth Index

6.1 Indicators and proxy variables

The green growth indicators in the 2024 Green Growth Index remained relatively the same from last year, except for two indicators, namely, the share of environmental goods exports to total exports (GT1) and the proportion of the population with convenient access to public transport (AB3), as discussed below. Figure 38 shows that 22 (or 46 percent) indicators are highly relevant to green growth, while the remaining 26 of the 48 green growth indicators in the Global Green Growth Index are either moderately relevant or proxy variables. Moderately rated indicators will continue to be reviewed to improve concept relevance or data coverage, while better indicators will replace proxy variables as data becomes available. The highly relevant indicators are mainly in efficient and sustainable resource use, while the moderately relevant indicators are in natural capital protection and social inclusion. The proxy variables are mostly represented in the green economic opportunities.

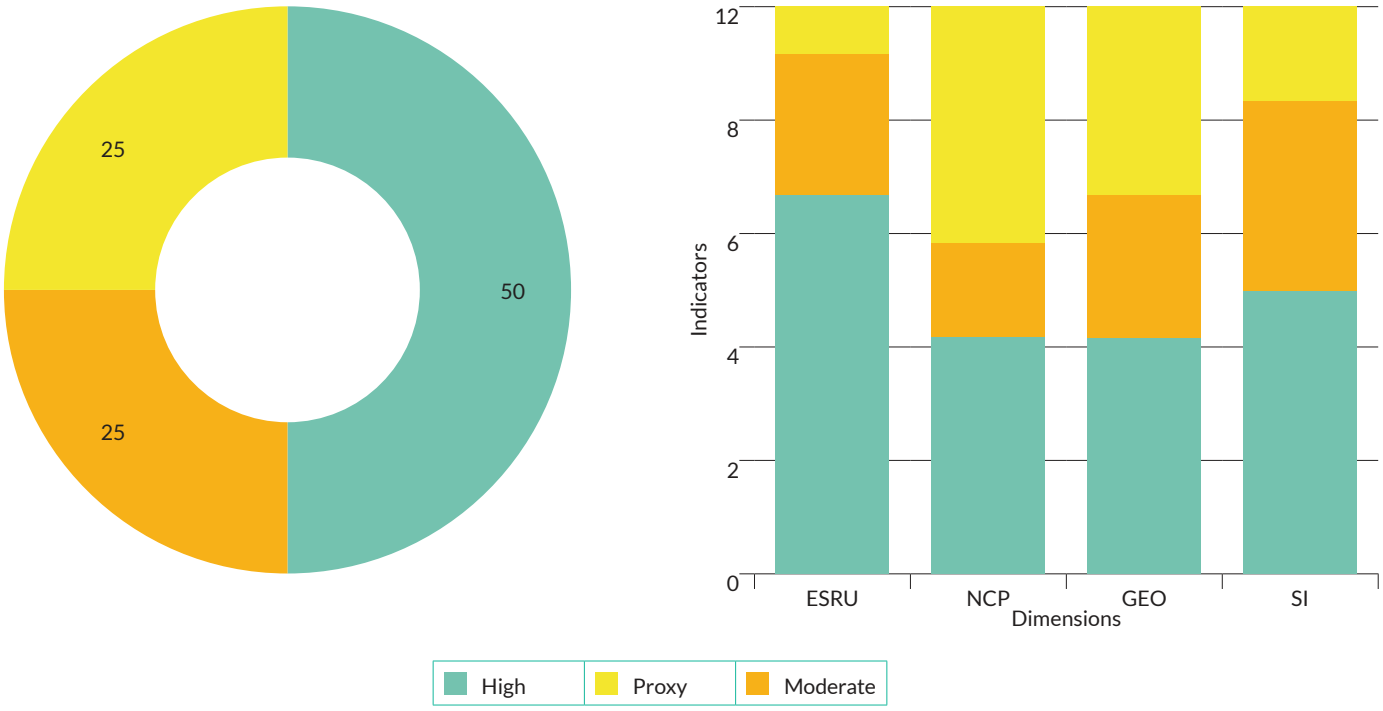
The efficient and sustainable resource use dimension has eight highly relevant indicators to green growth (Table 5). Two indicators are moderately relevant to green growth, including the share of freshwater withdrawal to available freshwater resources (EW2) and the share of organic agriculture to total agricultural land area (SL2). Although both indicators are very relevant to tracking performance in the green growth transition, the data availability must be reviewed to cover more time-series data. EW2 is an SDG indicator, and its data availability is expected to improve. There is only one proxy variable in the efficient and sustainable resource use dimension: the efficiency in sustainable transport (EE3). This will be replaced with a related SDG indicator when it becomes available.

The natural capital protection dimension includes five highly and two moderately relevant green growth indicators (Table 5). The first moderately rated indicator is the $PM_{2.5}$ air pollution, mean annual population-weighted exposure (EQ1), which will be improved by combining with PM_{10} when data becomes available. The second moderately rated indicator is the municipal solid waste (MSW) generation per capita (EQ3), constrained by data availability. It is one of the indicators contributing to the low confidence level in the Green Growth Index scores. There are five proxy variables in the natural capital protection dimension, three of which refer to the social and cultural value dimension. First, the DALY rate due to unsafe water sources (EQ2) is considered a proxy because it does not directly measure pollution (or environmental quality) in water ecosystems. This contrasts EQ1 and EQ3, which directly represent air and land pollution. However, as mentioned above, these pollution indicators also face data coverage challenges. Second, the share of forest area to total land area (BE2) is considered a proxy variable because it does not measure the rate of forestation or deforestation. This can be replaced with the SDG indicator 15.2.1, representing the forest area's annual net change rate. However, this SDG indicator still needs sufficient time-series data and country coverage. Third, the red list index (CV1) is only a proxy variable for measuring natural capital's cultural and social value. It can be replaced by an indicator focusing on species with significant social and cultural value to tourism and local and indigenous communities. Data for such an indicator is currently not available. Fourth, tourism and recreation in coastal and marine areas (CV2) is considered a proxy variable because it needs to focus on sustainable eco-tourism, which currently needs global data. Finally, the fifth proxy variable in natural capital protection is the share of terrestrial and marine protected areas to total territorial areas (CV3). Not all protected areas are accessible to the public and thus do not contribute to society's social and cultural well-being. A better indicator would be protected areas managed by and contributing to the lives of the indigenous and local communities.

The green economic opportunities dimension has five highly and three moderately rated green growth indicators (Table 5). In the previous reports, the share export of environmental goods (OECD and APEC class.) to total export (GT1) was rated moderately because the classification of environmental goods needed updating. The GGPM team computed the GT1 data due to lacking data sources. In this year's report, the International Monetary Fund (IMF) published data on the share of export of environmental goods to total export, which was used to compute the 2024 Green Growth Index scores. The IMF's indicator on the share of export of environmental goods to total export is considered highly relevant. The three remaining moderately rated green growth indicators include the share of green employment in total manufacturing employment (GJ1), renewable energy employment to total renewable energy (GJ2), and University-industry collaboration in Research & Development (R&D) (GN2). Improvement in GJ1 refers to covering other economic sectors, GJ2 to expanding time-series data, and GN2 to focusing on green R&D. GJ2 and GN2 were indicators added to last year's Green Growth Index.[153] There are four proxy variables in the green economic opportunities dimension. First, the ratio of adjusted net savings to GNI, including particulate emission damage (GV1), will be replaced by investment in renewable energy or green technology, the data of which is currently not available. Second, the total amount of funding to promote environmentally sound technologies per GDP (GV3) is an SDG indicator, but the UNSTATS SDG database currently provides a temporary variable (i.e., the amount of tracked exported environmentally sound technologies). Third, the employed population below the international poverty line (GJ3) is only a proxy variable because it does not focus on green employment. Fourth, installed renewable electricity-generating capacity (GN3) will be replaced with an indicator covering other energy sectors, not only electricity.

In the social inclusion dimension, six indicators have high relevance, and four have moderate relevance to green

Figure 38. Relevance of the indicators to green growth



growth (Table 5). The moderately rated indicators include the proportion of seats held by women in national parliaments (GB1), the population with access to basic services by urban/rural, i.e., electricity (SE2), the share of youth not in education, employment, or training (SE3), and proportion of population above statutory pensionable age receiving a pension (SP1). GB1 will be improved by combining it with women in managerial positions, which currently has scanty data, to cover women's employment in the private sector. SE2 will be expanded to cover safely managed drinking water and sanitation, lacking time-series data. The improvement in SE3 and SP1 will depend on the availability of more time-series data. There are only two proxy variables in the social inclusion dimension because last year's proxy variable for AB3, i.e., universal access to sustainable transport (Index), was replaced with an SDG indicator, the proportion of the population with convenient access to public transport. The first proxy variable, getting paid, covering laws and regulations for equal gender pay (GB3), will be improved by replacing it with an indicator measuring gender parity in salary and benefits. The second proxy variable, the proportion of the urban population living in slums (SP3), will be replaced by the indicator of inadequate housing, including homelessness, which UN-Habitat will make available.

Table 5. Relevance of indicators for the Green Growth Index and desired improvements for proxy variables

Codes	Baseline indicators	Relevance	Desired improvement and remarks
EE1	Ratio of total primary energy supply to GDP (MJ per $2017 PPP GDP)	High	
EE2	Share of renewable to total final energy consumption (Percent)	High	
EE3	Efficiency in sustainable transport (Index)	Proxy	Can be replaced with indicator from SDG database when it becomes available.
EW1	Water use efficiency (USD per m^3)	High	
EW2	Share of freshwater withdrawal to available freshwater resources (Percent)	Moderate	Improvement of time series data
EW3	Sustainable fisheries as a proportion of GDP (Percent)	High	

Table 5. Relevance of indicators for the Green Growth Index and desired improvements for proxy variables *(continued)*

Codes	Baseline indicators	Relevance	Desired improvement and remarks
SL1	Soil nutrient budget (Kilogram nitrogen per hectare)	High	
SL2	Share of organic agriculture to total agricultural land area (Percent)	Moderate	Improvement of time series data
SL3	Livestock per agricultural area (include only ruminant livestock)	Moderate	Can be replaced with indicator with ratio to total livestock area.
ME1	Total domestic material consumption (DMC) per unit of GDP (Kilogram per GDP)	High	
ME2	Total material footprint (MF) per capita (Tons per capita)	High	
ME3	Share of food loss to production and food waste to food consumption (Percent)	High	
EQ1	$PM_{2.5}$ air pollution, mean annual population-weighted exposure (Micrograms per m3)	Moderate	To be combined with PM_{10} as data availability improves.
EQ2	DALY rate due to unsafe water sources (DALY lost per 100,000 persons)	Proxy	Can be replaced with water pollution; no identified sources yet
EQ3	Municipal solid waste (MSW) generation per capita (Tons per year per capita)	Moderate	Improvement of time series data
GE1	Ratio of CO_2 emissions to population, including AFOLU (Tons per capita)	High	
GE2	Ratio of non-CO_2 emissions to population, excluding AFOLU (CO_2eq tons per capita)	High	
GE3	Ratio of non-CO_2 emissions in agriculture to population (CO_2eq tons per capita)	High	
BE1	Average proportion of key biodiversity areas covered by protected areas (Percent)	High	
BE2	Share of forest area to total land area (Percent)	Proxy	Can be replaced with indicator on SDG indicator 15.2.1 Forest area annual net change rate when time-series data and country coverage improve
BE3	Above-ground biomass stock in forest (Tons per hectare)	High	
CV1	Red list index (Index)	Proxy	Can be replaced by species of relevance to tourism, local, and indigenous communities
CV2	Tourism and recreation in coastal and marine areas (Score)	Proxy	Can be replaced by sustainable eco-tourism in different ecosystems; no identified sources yet
CV3	Share of terrestrial and marine protected areas to total territorial areas (Percent)	Proxy	Can be replaced by protected areas managed by indigenous and local communities
GV1	Ratio of adjusted net savings to GNI, including particulate emission damage (5 yrs moving ave.)	Proxy	Can be replaced by investment in renewable energy or green technology
GV2	Degree of integrated water resources management implementation, financing (%)	High	
GV3	Total amount of funding to promote environmentally sound technologies per GDP (Ratio)	Proxy	This is a new SDG indicator currently using proxy variable

Table 5. Relevance of indicators for the Green Growth Index and desired improvements for proxy variables *(continued)*

Codes	Baseline indicators	Relevance	Desired improvement and remarks
GT1	Share of export of environmental goods to total export (Percent)	High	
GT2	CO_2 emissions embedded in trade (Percent)	High	
GT3	Water virtual trade flows (Tons squared per year)	High	
GJ1	"Share of green employment in total manufacturing employment (Percent)	Moderate	Improvement in the indicator to measure green employment in different economic sectors
GJ2	Renewable Energy Employment by Country to total renewable energy (Number of Jobs per toe of primary energy supply)	Moderate	Improvement of time series data
GJ3	Employed population below international poverty line, by sex and age (Percent)	Proxy	International experts' ratings during the consultation were low
GN1	7-Year rolling average, patents on environment technologies	High	
GN2	University-industry collaboration in Research & Development (Score)	Moderate	Improvement in the indicator to focus on green research and development
GN3	Installed renewable electricity-generating capacity (watts per capita)	Proxy	Improvement to cover other energy sectors
AB1	Population with access to basic services, i.e., Water, sanitation, electricity, and clean fuels (Percent)	High	
AB2	Prevalence of undernourishment (Percent)	High	
AB3	Proportion of the population with convenient access to public transport	High	
GB1	Proportion of seats held by women in national parliaments (Percent)	Moderate	Can be combined with an indicator on positions held by women in managerial positions; data currently scanty
GB2	Ratio female to male with an account at a financial institution or mobile-money-service provider, age 15+ (Ratio)	High	
GB3	Getting paid, covering laws and regulations for equal gender pay (Score)	Proxy	Can be replaced by an indicator measuring gender parity in salary and benefits
SE1	Inequality in income based on Palma ratio (Ratio)	High	
SE2	Population with access to basic services by urban/rural, i.e., electricity (Ratio)	Moderate	Improvement of the indicator to measure renewable electricity; to add safely managed drinking water and sanitation, which have scanty time-series data
SE3	Share of youth (aged 15–24 years) not in education, employment, or training (Percent)	Moderate	Improvement in time series data
SP1	Proportion of population above statutory pensionable age receiving a pension (Percent)	Moderate	Improvement in time series data
SP2	Universal health coverage (UHC) service coverage index (Index)	High	
SP3	Proportion of urban population living in slums (Percent)	Proxy	Can be replaced by indicator on inadequate housing, including homelessness; to be made available by UN-Habitat

6.2 Data availability and confidence level

One indicator remains to have one data point: the municipal solid waste (MSW) generation per capita (EQ3) (Table 6), which was assumed to have a constant trend over time. Like in the previous reports, the indicators with only a few data points needing data imputations for several years include efficiency in sustainable transport (EE3), sustainable fisheries as a proportion of GDP (EW3), the share of terrestrial and marine protected areas to total territorial areas (CV3), and degree of integrated water resources management implementation, financing (GV2). The data for the green growth indicators were mainly collected from international organizations, which offers significant advantages for measuring performance across countries. For example, collecting data from national agencies for more than 100 countries will take time and effort. In contrast, the data from international organizations had already been collected from national agencies and had already undergone consistency checks. Data for all the indicators included in the Green Growth Index were downloaded from online sources, except for the share of green employment in total manufacturing employment (GJ1) and water virtual trade flows (GT3). GGGI calculated them using data from online sources, and they are available for download on the Green Growth Index website (https://ggindex-simtool.gggi.org/SimulationDashBoard/data).

Data availability is a significant challenge that affects the interpretability of any global index and thus needs transparency. In the case of the 2024 Green Growth Index, there are three issues to consider.

First, some indicators have data only for a limited number of countries. The completeness of indicators or lack of data for indicators influences the scores for the Green Growth Index. For example, a country with complete data for all indicators for green economic opportunities will have lower scores if one of the four indicators has zero value, thus pulling down the values of other indicators. In contrast, another country with incomplete data will have a higher score because the fourth indicator, which may also have a value of zero but missing and unknown, will be excluded by default. Thus, the lack of data causes uncertainty in the Green Growth Index results. Allowing missing values is, however, necessary to enable the substitutability of indicators that represent the same concept defined by the pillar and maintain a more significant number of countries until the last level of aggregation. Not allowing substitutability at the first and second levels of aggregation will exclude countries with missing values. As a rule, 25 percent of the missing data were allowed to aggregate indicators (see Annex 1, Acosta et al. 2019[154]). The Green Growth Index could be computed for about 243 countries globally without missing values. Due to data gaps, however, the current index was calculated only for 154 countries.

Second, the most recent available data vary across indicators (Table 6). To enable computation of the Green Growth Index for 2024, the most recent data were used as a baseline, and values were assumed to hold until 2023. For example, one of the 48 green growth indicators used 2018 data for 2020-2023, and a few others used 2019 for 2020-2023. This approach is commonly used in other global indices.

Third, for the missing data between the time series from 2010, the adjacent data were used to represent data for the missing years (i.e., imputed data). Imputation is essential to avoid a drastic drop or discontinuity in the Index trend from 2010 to 2023 due to missing data, which could be misinterpreted as a decline in performance. The confidence level is attached to the Index trend to highlight the uncertainty the missing data can cause. The level of confidence is based on data availability from 2010 to 2023. Figure 39 presents the distribution of 154 countries with Index scores based on their data availability. Generally, data availability is around 75 percent because 25 percent of the missing data was allowed in the aggregation rule. The mean for the data availability is 70 percent. Based on these statistics, the confidence levels were assigned as follows: Data availability of 70 percent and above has a high confidence level, between 60 and 70 percent has a moderate confidence level, and below 60 percent has a low confidence level.

Figure 40 presents the confidence level for the Green Growth Index globally, by region and dimension, based on data availability from 2010 to 2023. The confidence level represents the 154 countries with Green Growth Index scores (i.e., ranked countries). The confidence levels for natural capital protection are high for most countries in all regions, about 70 percent of the countries globally, indicating a high data availability for the indicators in this dimension. The Americas show the most significant number of countries with a high confidence level, almost 90 percent. The social inclusion dimension shows a high confidence level for most American and European countries, with the latter representing over 90 percent. The confidence level for this dimension is mostly moderate for the African countries but low for the Oceanian countries. However, globally, a high confidence level is observed. Regarding green economic opportunities, the Americas have the most significant countries with a high confidence level, albeit low at about 45 percent. A low confidence level dominates this dimension, particularly in Oceania and Europe, with about 100 and 95 percent of the countries, respectively. A huge data gap for green economic opportunities affects the confidence level of scores in these regions and globally. This is the dimension where many indicators need data imputation to fill the data gaps. In the efficient and sustainable resource use dimension, Europe and the Americas are dominated by countries with

high confidence levels, over 50 percent. In contrast, about 50 percent of the Oceania countries have only moderate confidence levels. Africa has the highest share of countries with low confidence levels, over 30 percent. The confidence level results emphasize the need to improve data availability in many countries across dimensions to improve the Green Growth Index's ability to track performance in the green growth transition. For this reason, GGGI annually assesses data availability for the indicators, particularly from the SDGs, to improve the Green Growth Index for many countries.

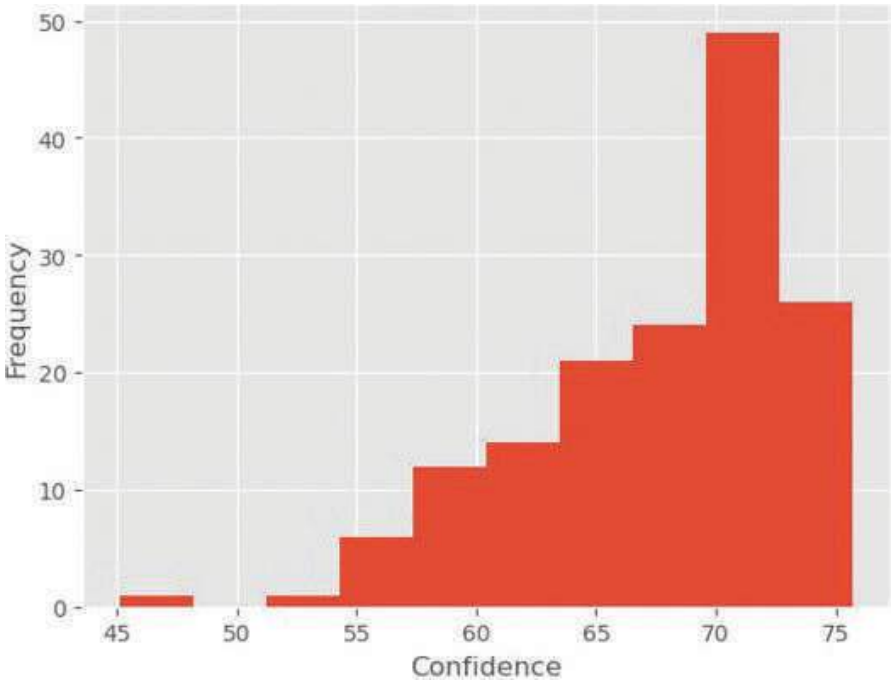
Table 6. Characteristics of the indicators in terms of data availability and required imputation

Codes	Available Data	Baseline Data	Data Downloaded Source	Source Website	Year(s) imputed for 2024 Index (only consider years between 2010 and 2023)
EE1	2000 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2022, 2023
EE2	2000 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2022, 2023
EE3	2010 - 2018	2018	WB data	https://lpi.worldbank.org/	2011, 2013, 2015, 2017, 2019, 2020, 2021, 2022, 2023
EW1	2000 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2022, 2023
EW2	2000 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2022, 2023
EW3	2011 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2010, 2012, 2014, 2016, 2020, 2022, 2023
SL1	1961 - 2021	2021	FAOSTAT	https://www.fao.org/faostat/en/#data/ESB	2022, 2023
SL2	2004 - 2022	2022	FAOSTAT	http://www.fao.org/faostat/en/#data/EL	2023
SL3	1961 - 2021	2021	FAOSTAT	https://www.fao.org/faostat/en/?fbclid=IwAR0dEJjoD4nMZkIqQehBdP04CfE2noGLbSUI7CHh_VfRbn4ugcAqEgAWgSc#data/EK	2022, 2023
ME1	2000 - 2022	2022	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2023
ME2	1970 - 2019	2019	UNEP-IRP	https://www.resourcepanel.org/global-material-flows-database	2020, 2021, 2022, 2023
ME3	2010 - 2022	2022	FAOSTAT	http://www.fao.org/faostat/en/#data/SCL	2023
GV1	1990 - 2021	2021	WB data	https://data.worldbank.org/indicator	2022, 2023
GV2	2017 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2010, 2011, 2012, 2013, 2014, 2015, 2016, 2018, 2019, 2021, 2022
GV3	2010 - 2020	2020	WB data	https://unstats.un.org/sdgs/indicators/database/	2021, 2022, 2023
GT1	1998 - 2021	2021	IMF	https://climatedata.imf.org/datasets/8636ce866c8a404b8d9baeaffa2c6cb3_0/explore?showTable=true	2022, 2023
GT2	1990 - 2021	2021	Our World in Data	https://ourworldindata.org/grapher/share-co2-embedded-in-trade	2022, 2023
GT3	1961 - 2021	2021	Waterfootprint and FAO	ttps://www.waterfootprintassessmenttool.org/countries/~AFG/scope_https://www.fao.org/faostat/en/#data/TCL	2022, 2023
GJ1	2000 - 2022	2022	Valentin Todorov	Not Available online,data computed and shared by the author	2023
GJ2	2002 - 2023	2023	IRENA and OECD	https://www.irena.org/Data/View-data-by-topic/Benefits/Renewable-Energy-Employment-by-Country AND https://data.oecd.org/energy/renewable-energy.htm#indicator-chart	
GJ3	2000 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2022, 2023

Table 6. Characteristics of the indicators in terms of data availability and required imputation *(continued)*

Codes	Available Data	Baseline Data	Data Downloaded Source	Website	Year(s) imputed for 2022 Index (only consider years between 2010 and 2021)
GN1	1990 - 2021	2021	OECD	https://data.oecd.org/envpolicy/patents-on-environment-technologies.htm	2022, 2023
GN2	2007 - 2017	2017	WB GovData360	https://govdata360.worldbank.org/indicators/	2018, 2019, 2020, 2021, 2022, 2023
GN3	2000 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2022, 2023
EQ1	1990 - 2019	2019	WB data	https://data.worldbank.org/indicator	2020, 2021, 2022, 2023
EQ2	1990 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2022, 2023
EQ3	2018	2018	WB Waste	https://datacatalog.worldbank.org/dataset/what-waste-global-database	2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2019, 2020, 2021, 2022, 2023
GE1	1990 - 2023	2023	ClimateWatch and WB data	https://www.climatewatchdata.org/ghg-emissions AND https://data.worldbank.org/indicator	
GE2	1990 - 2023	2023	ClimateWatch and WB data	https://www.climatewatchdata.org/ghg-emissions AND https://data.worldbank.org/indicator	
GE3	1990 - 2023	2023	ClimateWatch and WB data	https://www.climatewatchdata.org/ghg-emissions AND https://data.worldbank.org/indicator	
BE1	2000 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
BE2	1990 - 2021	2021	WB data	https://data.worldbank.org/indicator	2022, 2023
BE3	2000 - 2020	2020	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2011, 2012, 2013, 2014, 2021, 2022, 2023
CV1	1993 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
CV2	2012 - 2020	2020	OHI	http://ohi-science.org/ohi-global/download	2010, 2011, 2021, 2022, 2023
CV3	2016 - 2022	2022	WB data	https://data.worldbank.org/indicator	2010, 2011, 2012, 2013, 2014, 2015, 2023
AB1	2000 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
AB2	2001 - 2022	2022	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2023
AB3	2012 - 2023	2023	UNSTAT	https://unstats.un.org/sdgs/indicators/database/	2010, 2011, 2013, 2014, 2015
GB1	2000 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
GB2	2000 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
GB3	1971 - 2023	2023	WB WBL	http://wbl.worldbank.org/en/reports	
SE1	1963 - 2023	2023	WB data	https://data.worldbank.org/indicator	
SE2	2000 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
SE3	2000 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
SP1	1996 - 2023	2023	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	
SP2	2000 - 2021	2021	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2011, 2012, 2013, 2014, 2016, 2018, 2020, 2022, 2023
SP3	1999 - 2022	2022	UNSTATS	https://unstats.un.org/sdgs/indicators/database/	2011, 2013, 2015, 2017, 2021, 2023

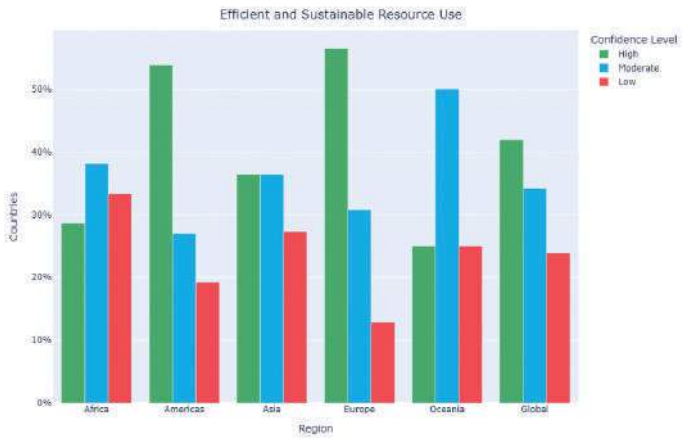
Figure 39. Confidence level based on data availability for 154 countries, 2010-2023



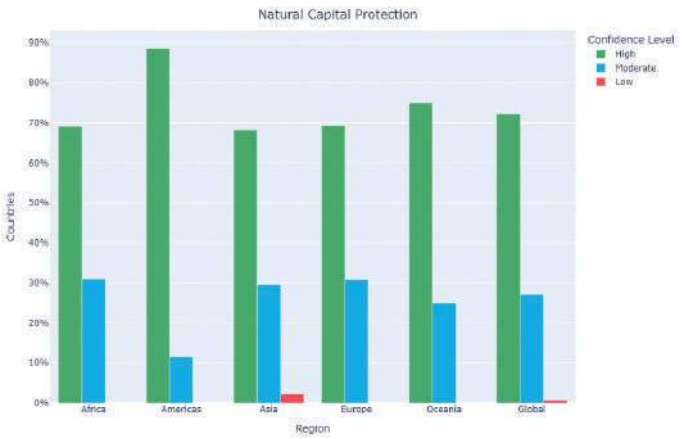
	Confidence
count	154.000000
mean	67.773075
std	5.601295
min	45.089286
25%	64.360119
50%	69.419643
75%	72.172619
max	75.744048

Figure 40. Distribution of confidence levels based on data availability by region and dimension, 2010-2023

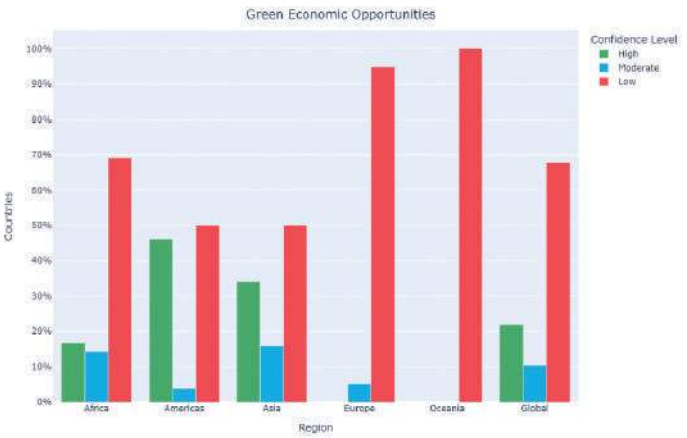
Efficient and Sustainable Resource Use



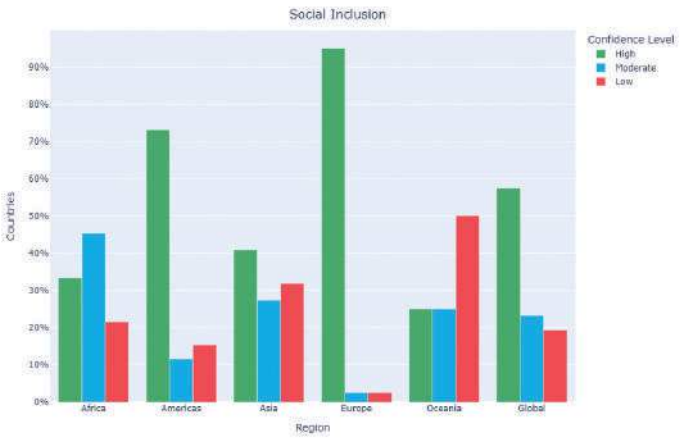
Natural Capital Protection



Green Economic Opportunities



Social Inclusion



6.3 Sustainability targets

The sustainability targets were essential inputs to calculating the Green Growth Index (Annex 1). They served as benchmarks for the green growth indicators, enabling the Index scores to reflect the distance to achieving these targets—a score of 100 indicates full target attainment. The targets were classified into three categories (Table 7): (i) SDG targets, (ii) targets from sources other than SDG indicators, and (iii) the average performance of the top five countries. When targets were unavailable from SDG indicators or other credible sources, they were derived from the average values of the top five performing countries (or the bottom five for indicators negatively linked to green growth). The Green Growth Index targets were aligned with SDG targets as closely as possible, using sustainability targets from established global indices such as the SDSN's SDG Index and OECD's SDG Indicators. The SDG targets were categorized as explicit or implicit, with the latter requiring interpretation. For the Green Growth Index, the GGPM team relied on existing interpretations, including those suggested by the OECD[155] and SDSN[156]. In conflicting target interpretations, SDSN's targets were prioritized due to their global-context-based methodology, which is consistent with the Green Growth Index. Alignment with the SDG targets remains essential for offering coherent policy recommendations to countries.

Of the 48 green growth indicators, 19 were based on the mean values of the top five performing countries (Table 7), ensuring that targets could be reached regardless of a country's current performance. However, these averages were sufficiently high that only a few countries achieved them. For example, the highest number of countries meeting a target was 29 for the 7-year rolling average of environmental technology patents (GN1). Nearly 90 percent of the 154 countries met the target for the share of forest area to total land area (BE2), with a 17 percent target set according to the Aichi biodiversity target for 2030, which was also adopted by the OECD and SDSN.[157] Another indicator with broad achievement, surpassing 75 percent, was the share of freshwater withdrawal relative to available freshwater resources (EW2), for which the FAO proposed a target between 25 and 75 percent.[158]

Conversely, several targets remained unattainable for all countries. These included efficiency in sustainable transport (EE3) with a target score of five, the DALY rate from unsafe water sources (EQ2) targeting zero DALYs lost per 100,000 people, municipal solid waste (MSW) generation per capita (EQ3) with a target of 0.001752675 tons per person per year, and 100 percent coverage of Key Biodiversity Areas by protected areas. Similarly, the Red List Index (CV1) aimed for a score of one, while the proportion of the population with convenient access to public transport (AB3) targeted 100 percent. Other unachieved targets included reducing the share of youth (aged 15-24 years) not in education, employment, or training (SE3) to zero percent and achieving a universal health coverage (UHC) service coverage index (SP2) of 100.

Table 7. Details on the sustainability targets used to benchmark the indicators

Codes	Indicators	Unstat SDG Indicator	Targets	Countries Reaching Targets	Types of Targets	Source of data	Source of targets
EE1	Energy intensity level of primary energy (MJ per $2017 PPP GDP)	Yes	1 MJ per GDP	2	Mean top 5 performers	SE4ALL	Method based on Sachs et al. (2019)
EE2	Share renewable to total final energy consumption (Percent)	Yes	51.4 Percent	47	Other targets	SE4ALL	Sachs et al. (2019)
EE3	Efficiency in sustainable transport (Index)	No	5 Index score	0	Other targets	Sum4all	Sum4all
EW1	Water use efficiency (USD per m3)	Yes	265.7579346 USD per m	4	Other targets	FAO	OECD (2019)
EW2	Share freshwater withdrawal to available freshwater resources (Percent)	Yes	25 and 75 Percent	119	Other targets	FAO	FAO 2017
EW3	Sustainable fisheries as a proportion of GDP (Percent)	Yes	9.782 Percent	3	Mean top 5 performers	FAO	Method based on Sachs et al. (2019)
SL1	Soil nutrient budget (Nitrogen kilogram per hectare)	No	5 Kg per hectare	33	Other targets	FAO	FAO
SL2	Share agriculture organic to total agriculture land area (Percent)	No	11.90 Percent	13	Other targets	FAO	OECD 2017b
SL3	Share of ruminant livestock population to agricultural area (Percent)	No	0.028 Livestock units per hectare	3	Mean top 5 performers	FAO	Method based on Sachs et al. (2019)
ME1	Domestic material consumption per unit of GDP. by type of raw material	Yes	0 kg per GDP	5	Mean top 5 performers	WESR / Global Material Flows Database.	Method based on Sachs et al. (2019)
ME2	Total material footprint (MF) per capital population (Tons per capita)	Yes	5 MF tons per capita	6	Other targets	IRP	Stefan Bringezu (2015)
ME3	Share of food loss to production and food waste to food consumption (Percent)	Yes	4.168092 Percent	1	Mean top 5 performers	FAO (food loss) and UNEP (food waste)	Method based on Sachs et al. (2019)
EQ1	PM2.5 air pollution, mean annual population- weighted exposure (Micrograms per m3	Yes	10 Micrograms per m3	31	Other targets	Brauer et al. 2016	WHO 2005; OECD (2019)

Table 7. Details on the sustainability targets used to benchmark the indicators *(continued)*

Codes	Indicators	Unstat SDG Indicator	Targets	Countries Reaching Targets	Types of Targets	Source of data	Source of targets
EQ2	DALY rate due to unsafe water sources (DALY lost per 100,000 persons)	Yes	0 in every 100,000 population	0	SDG Target (implicit)	IHME	OECD (2019)
EQ3	Municipal solid waste (MSW) generation per capita (Tons per year per capita)	Yes	0.001752675 Ton per year per capita	0	Other targets	WB	Sachs et al. (2019)
GE1	Ratio of CO2 emissions to population. including AFOLU (Tons per capita)	Yes	0.128324 Ton per capita	2	Mean top 5 performers	CAIT	Method based on Sachs et al. (2019)
GE2	Ratio non-CO2 emissions (CH N2O and F-gas) excluding AFOLU to population (CO 2 tons per capita)	Yes	0.058778 Ton per capita	3	Mean top 5 performers	CAIT	Method based on Sachs et al. (2019)
GE3	Ratio non-CO, emissions (CH N2O and F-ges) in Agriculture and LUCF to population (CO tons per capita)	Yes	0 Ton per capita	6	Mean top 5 performers	CAIT	Method based on Sachs et al. (2019)
BE1	Average proportion of Key Biodiversity Areas covered by protected areas (Percent)	Yes	100 Percent	3	SDG Target (explicit)	IUCN, UNEP-WCMC	Sachs et al. (2019)
BE2	Share forest area to total land area (Percent)	Yes	17 Percent	138	Other targets	FAO	OECD (2019); Sachs et al. (2019)
BE3	Above-ground biomass stock in forest (Tons per hectare)	Yes	428.688Tons per hectare	2	Mean top 5 performers	FAO	Method based on Sachs et al. (2019)
CV1	Red list index (Index)	Yes	1 Index score	0	Other targets	BirdLife International and IUCN	OECD (2019); Sachs et al. (2019)
CV2	Tourism and recreation in coastal and marine areas (Score)	No	100 Index score	20	Other targets	Ocean Health Index	Sachs et al. (2019)
CV3	Share of terrestrial and marine protected areas to total territorial areas (Percent)	Yes	13.5 Percent for both terrestrial and marine	84	SDG Target (explicit) for marine; Other targets for terrestrial	UNEP-WCMC	Leadly et. al. (2014)
GV1	Ratio of adjusted net savings to GNI, including particulate emission damange (5 yrs moving ave.)	No	32.054127 Percent of GNI	2	Mean top 5 performers	WB	Method based on Sachs et al. (2019)
GV2	Degree of integrated water resources management implementation, financing (%)	Yes	98.166667 Percent	3	Mean top 5 performers	UNEP	Method based on Sachs et al. (2019)

Table 7. Details on the sustainability targets used to benchmark the indicators *(continued)*

Codes	Indicators	Unstat SDG Indicator	Targets	Countries Reaching Targets	Types of Targets	Source of data	Source of targets
GV3	Total amount of funding to promote environmentally sound technologies per GDP (Ratio)	Yes	0.133719 Ratio	3	Mean top 5 performers	UNEP-WESR, WB, and OECD	Method based on Sachs et al. (2019)
GT1	Share of export of environmental goods to total export (%)	No	27.124242 Percent	2	Mean top 5 performers	IMF	Method based on Sachs et al. (2019)
GT2	CO2 emissions embedded in trade (Percent)	No	0 Percent	29	Other targets	Global Carbon Budget (2023)	Normative
GT3	Water virtual trade flows (Tonnes squared per year)	No	4537.934674 Tonnes squared per year	3	Mean top 5 performers	Waterfootprint and FAO	Method based on Sachs et al. (2019)
GJ1	Share of green employment in total manufacturing employment (Percent)	No	0.150116 Percent	2	Mean top 5 performers	Moll de Alba and Todorov 2018,2019	Method based on Sachs et al. (2019)
GJ2	Renewable Energy Employment by Country to total renewable energy(Number of Jobs per toe of primary energy supply)	No	194.444596 Number of Jobs per toe of primary energy supply	2	Mean top 5 performers	IRENA and ILO (2022)	Method based on Sachs et al. (2019)
GJ3	Employed population below international poverty line, by sex and age (Percent)	Yes	0 Percent	4	Other targets	ILO modelled estimates	Normative
GN1	7 Years rolling average Patents on environment technologies	No	100 Percent	29	Mean top 5 performers	OECD	Method based on Sachs et al. (2019)
GN2	University-industry collaboration in Research & Development (Score)	No	5.674 Score	3	Mean top 5 performers	WB	Method based on Sachs et al. (2019)
GN3	Installed renewable electricity-generating capacity (watts per capita)	Yes	1464.0498 Watts per capita	1	Mean top 5 performers	IRENA and UN World Population Prospects	Method based on Sachs et al. (2019)
AB1	Population with access to basic services i.e. Water, sanitation, electricity. and clean fuels (Percent)	Yes	100 Percent for both water and sanitation	32	SDG Target (implicit)	WHO/ UNICEF	OECD (2019); Sachs et al. (2019)
AB2	Prevalence of undernourishment (Percent)	Yes	0 Percent	56	SDG Target (explicit)	FAO	Normative

Table 7. Details on the sustainability targets used to benchmark the indicators *(continued)*

Codes	Indicators	Unstat SDG Indicator	Targets	Countries Reaching Targets	Types of Targets	Source of data	Source of targets
AB3	Proportion of population that has convenient access to public transport (%)	Yes	100 Percent	0	Other targets	UNSTAT	Normative
GB1	Proportion of seats held by women in national parliaments (Percent)	Yes	50 Percent	4	SDG Target (explicit)	IPU	OECD (2019); Sachs et al. (2019)
GB2	Share of adults (15 years and older) with an account at 8 financial institution or mobile- money-service provider (Percent)	Yes	1 Equality ratio	2	Other targets	WB	Normative
GB3	Getting paid, laws and regulations for equal gender pay (Score)	No	100 Percent	62	Other targets	WB	Normative
SE1	Inequality in income based Palma ratio (Ratio)	No	0.843472 Ratio	3	Mean top 5 performers	WB	Method based on Sachs et al. (2019)
SE2	Population with access to basic services by urban/ rural, i.e. electricity (Ratio)	Yes	1 Equality ratio	121	Other targets	SE4ALL	Normative
SE3	Share of youth (aged 15-24 years) not in education, employment or training (Percent)	Yes	0 Percent	0	SDG Target (implicit)	ILO	OECD (2019)
SP1	Proportion population above statutory pensionable age receiving a pension (Percent)	Yes	100 Percent	62	SDG Target (implicit)	ILO	OECD (2019)
SP2	Universal health coverage (UHC) service coverage index (Index)	Yes	100 Index score	0	Other targets	WHO	Normative
SP3	Proportion of urban population living in slums (Percent)	Yes	0 Percent	18	Other targets	UN-Habitat	Normative

Data Sources: Leadley, P. W., Krug, C., Alkemade, R., Pereira, H. M., Sumaila, U. R., Walpole, M., … Mumby, P. J. (2014). Progress towards the Aichi biodiversity targets: An assessment of biodiversity trends, policy scenarios and key actions.
OECD. (2019). Measuring Distance to the SDG Targets: Metadata. OECD Publishing.
Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G., & Fuller, G. (2019). Sustainable Development Report 2019. Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN).

7 Applications of the Green Growth Index

7.1 Completed projects 2024

7.1.1 Lao PDR Green Growth Index

Collaborators: GGPM Team, Ministry and Investment (MPI), GGGI Lao PDR Team.

Duration: April 2022 – January 2024

Objectives: Under the National Green Growth Strategy (NGGS), a monitoring and evaluation framework included an early attempt at developing an index through which the Ministry of Planning and Investment (MPI) could monitor and track green investment in Lao PDR. However, this needed to be operationalized. As the Government of Lao PDR has scaled up its commitment to green growth over the past five years, an improved operational index is needed. Such an index will allow MPI to a) monitor the implementation of the National Green Growth Strategy, at the same time, be used as an essential tool in mainstreaming green growth into national, sub-national, and sectoral strategies and development plans in the more comprehensive manner, b) evaluate the implementation towards the outcomes, targets, and indicators set in the National Green Growth Strategy, and c) review and revise the national Green Growth Index for future update of the National Green Growth Strategy. GGGI has led global efforts at building and applying the Green Growth Index, and these experiences were channeled into Lao PDR. For this, the Lao PDR Green Growth Index was developed in collaboration with MPI, and the government officials were capacitated to use and deploy this Index. Through the MPI's coordination, responsibilities for monitoring and collecting data for the green growth indicators selected for the Green Growth Index were assigned to relevant ministries and line agencies. Moreover, it was agreed to replace the current NGGS monitoring framework with the Lao PDR Green Growth Index and integrate it into the next 5-year National Socio-Economic Development Plan (NSEDP).

Main Outputs:

- Lao PDR Green Growth Index report (https://laos-greengrowthindex.herokuapp.com/DashBoard/downloads_report)
- Lao PDR Green Growth Index website (https://laos-greengrowthindex.herokuapp.com/DashBoard/country_overview)
- Presentation during the Global Green Growth Week 2023 (https://www.youtube.com/live/MxdiXwgEix0?feature=shared)
- The highlights of the Lao PDR Green Growth Index report are presented in Chapter 5 of this report.

7.1.2 Africa LDC Green Growth Index

Collaborators: GGPM Team; African Regional Office; GGGI Country Offices and Government Partners in Burkina Faso, Ethiopia, Mozambique, Rwanda, Senegal, Togo, Uganda, and Zambia

Duration: May – December 2024

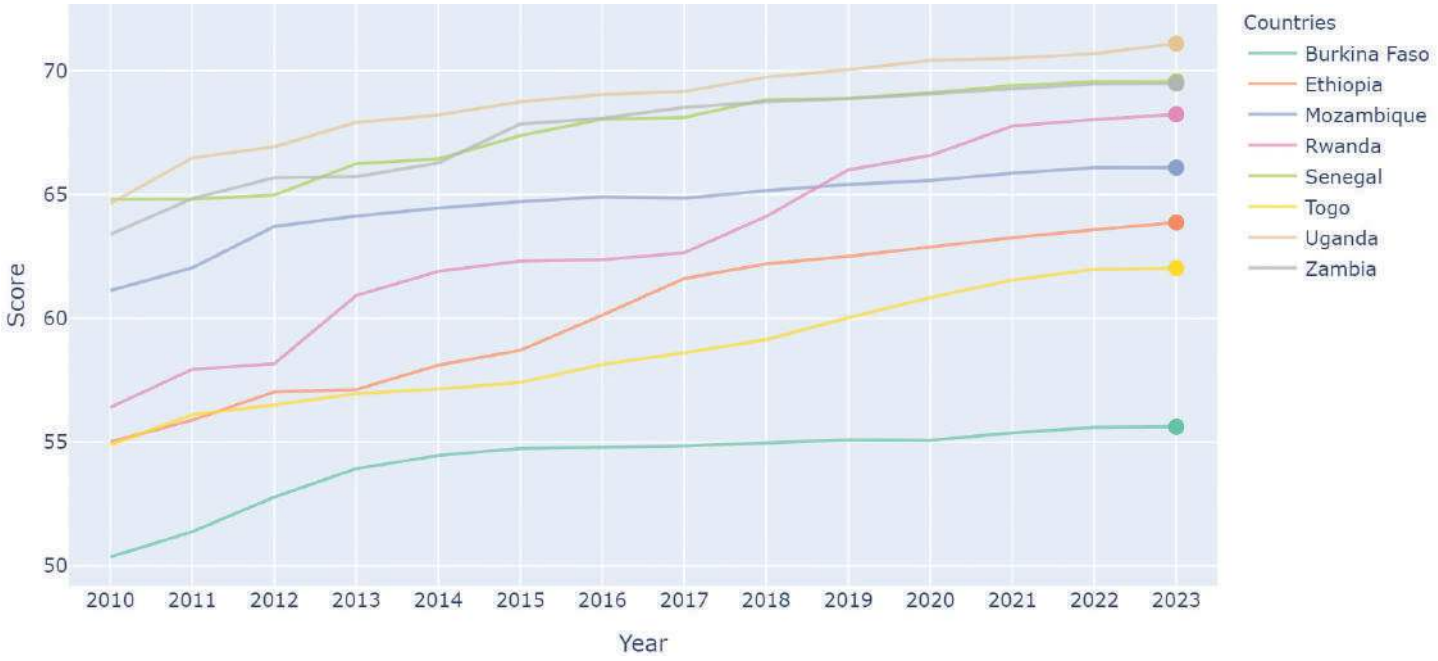
Objectives: GGGI supports eight Least Developed Countries (LDCs) in Africa, including Burkina Faso, Ethiopia, Mozambique, Rwanda, Senegal, Togo, Uganda, and Zambia, to transition to a green and sustainable growth model. Developing a Green Growth Index using a standardized framework of green growth indicators across these LDCs will allow comparison of their green growth performance and identify strengths and areas needing improvement. The Africa LDC Green Growth Index highlights achievements and gaps in the green growth transition and, thus, raises awareness at GGGI and its global partners and donors about the sectors and areas needing green and climate investments. The policy relevance of the green growth indicators used in developing the Africa LDC Green Growth Index was rated by the GGGI Country Office Teams and Government Partners in the eight above-mentioned Africa LDCs. The GGPM Team assessed the relevance of these green growth indicators with the countries' respective Vision 2030, National Development Plans (NDPs), Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), and National Biodiversity Strategies and Action Plans (NBSAPs). Because many indicators in the Africa LDC Green Growth Index are Sustainable Development Goal (SDG) indicators, the assessment informs about aligning the countries' key policies with the SDGs.

Main Outputs:

- Technical report on Green Growth Index – A Comparative Assessment of Green Growth Performance in African LDCs
- Africa LDC Green Growth Index website
- Presentation and panel discussion of the Africa LDC Green Growth Index during the 2024 Global Green Growth Week (Figure 42)

The results of the Green Growth Index for the eight African LDCs showed that their green growth performances followed gradual improvements from 2010 to 2023 (Figure 41). The eight African LDCs experienced gradual improvements in their Green Growth Index scores from 2010 to 2023. Senegal was one of the best-performing countries, with the highest scores over the entire period, from 65.64 in 2010 to 70.51 in 2023. In contrast, Burkina Faso had the lowest

Figure 41. Green Growth Index scores for the Africa LDCs, 2010-2023



score in 2010, at 50.36, but achieved modest growth to 55.62 in 2023. However, Uganda demonstrated the most significant growth, increasing from 64.63 in 2010 to 72.29 in 2023, making it the top performer in 2023. Rwanda also showed significant progress during this period. Mozambique and Zambia showed steady but slower growth. Despite improvements, Burkina Faso and Togo lag behind other countries, with the latter scoring 55.46 in 2010 and 62.79 in 2023. The results highlight varying performances in green growth transition across the African LDCs, with Senegal, Uganda, and Rwanda leading the way and Burkina Faso and Togo facing challenges.

The Africa LDC Green Growth Index was presented in the session for the Green Growth Index

Measuring Green Growth Performance in Africa during the Global Green Growth Week on October 14, 2024 (Figure42). Dr. Malle Fofana, GGGI Director Africa Regional Office (ARO), opened the session, explaining the usefulness of the Green Growth Index for the African LDCs. Dr. Kyung Nam Shin, GGGI Assistant Director General and Head of the Investment and Policy Solutions Division (IPSD) gave the welcome remarks, providing an overview of GGGI's progress in rolling out the application of the Green Growth Index at the global, regional, and national levels. Ms. Helena McLeod, GGGI Deputy Director-General, Head of Green Growth Planning and Implementation (GGP&I) Division, gave the keynote message, explaining why the developing countries, especially the LDCs, are at the heart of GGGI's work and sharing her experience and observations about the significant progress and impact of the Institute's support on the local people. Dr. Lilibeth Acosta, GGGI Global Program Manager for the Green Growth Performance Measurement (GGPM), presented the Green Growth Index scores for the African LDCs (Figure 41), reminding the audience of the implications of data gaps in interpreting the scores. Her presentation was followed by a panel discussion with the virtual participation of experts from the Food and Agriculture Organization of the United Nations (FAO), the International Energy Agency (IEA), and the International Telecommunication Union (ITU). The panel discussion, titled "Be Mindful of the SDG Data Gaps" – Data Collection Challenges in Africa, included three experts: Dr. Francesco Tubiello, Senior Statistician, Team Leader, Agri-Environmental Statistics Division, FAO; Ms. Zakia Adam, Statistics Manager, National Capacities and Africa Energy Data and Modelling Programme, Energy Data Center, IEA, and Dr. Rosie McDonald, Climate Change Officer, ICT Data and Analytics Division, ITU. The following questions guided their discussions: (1) As a custodian of SDGs, how is your organization supporting the development of methodologies and/or collection of data for the SDGs? (2) How do you work with the governments to collect the SDG databases? What are the challenges you encounter, particularly in Africa? (3) How can an organization like GGGI support SDG custodians in overcoming challenges in data collection and improving the SDG database? Ms. Ingvild Solvang, GGGI Director, Climate Action and Inclusive Development, gave closing remarks to the session.

7.1.3 GGSim application in NGGS/NAP Lao PDR

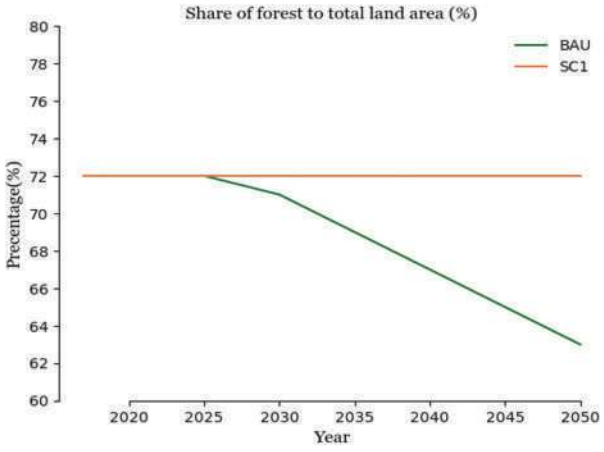
Collaborators: GGPM Team; Climate Action and Inclusive Development (CAID), GGGI Lao PDR Team, OECD, Ministry of Planning and Investment (MPI) and the Ministry of Natural Resources and Environment (MoNRE)

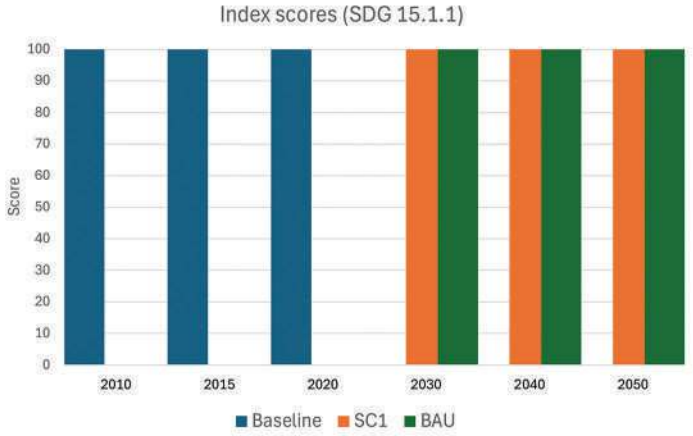
Duration: November 2023 – December 2024

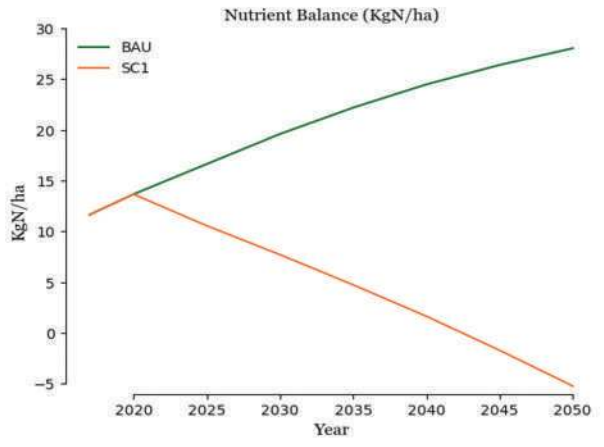
Figure 42. Panel discussion on the Africa LDC Green Growth Index during the 2024 Global Green Growth Week

Objectives: Lao PDR is among the least developed countries and is projected to face increasingly significant climate-related hazards such as floods and droughts[159]. The project is implemented to support the development of the Lao PDR National Adaptation Plan (NAP) and the updating of the National Green Growth Strategy (NGGS), as well as analyze the socio-economic impacts of different climate scenarios and model the effects of potential adaptation policies. In addition to the GGSim, two other models were applied: the Holistic Risk model (estimation of the total effect of a disaster as it disrupts trade, investment, and employment) and the Agricultural Adaptation model (forecast of policy and investment outcomes across sectors, actors, dimensions of development, time and space).
The project aimed to assess the avoided losses, benefits, costs, and investment requirements of different climate adaptation measures. GGSim application, which the GGPM Team implemented, aimed to assess the co-benefits of adaptation measures to selected SDGs, including share of forest to total land area (SDG 15.1.1), nutrient balance

Figure 43. Selected results from the GGSim AFOLU model for Lao PDR's adaptation measures







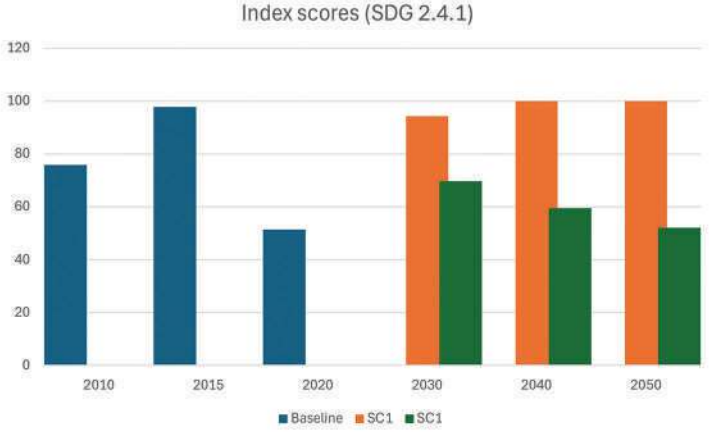
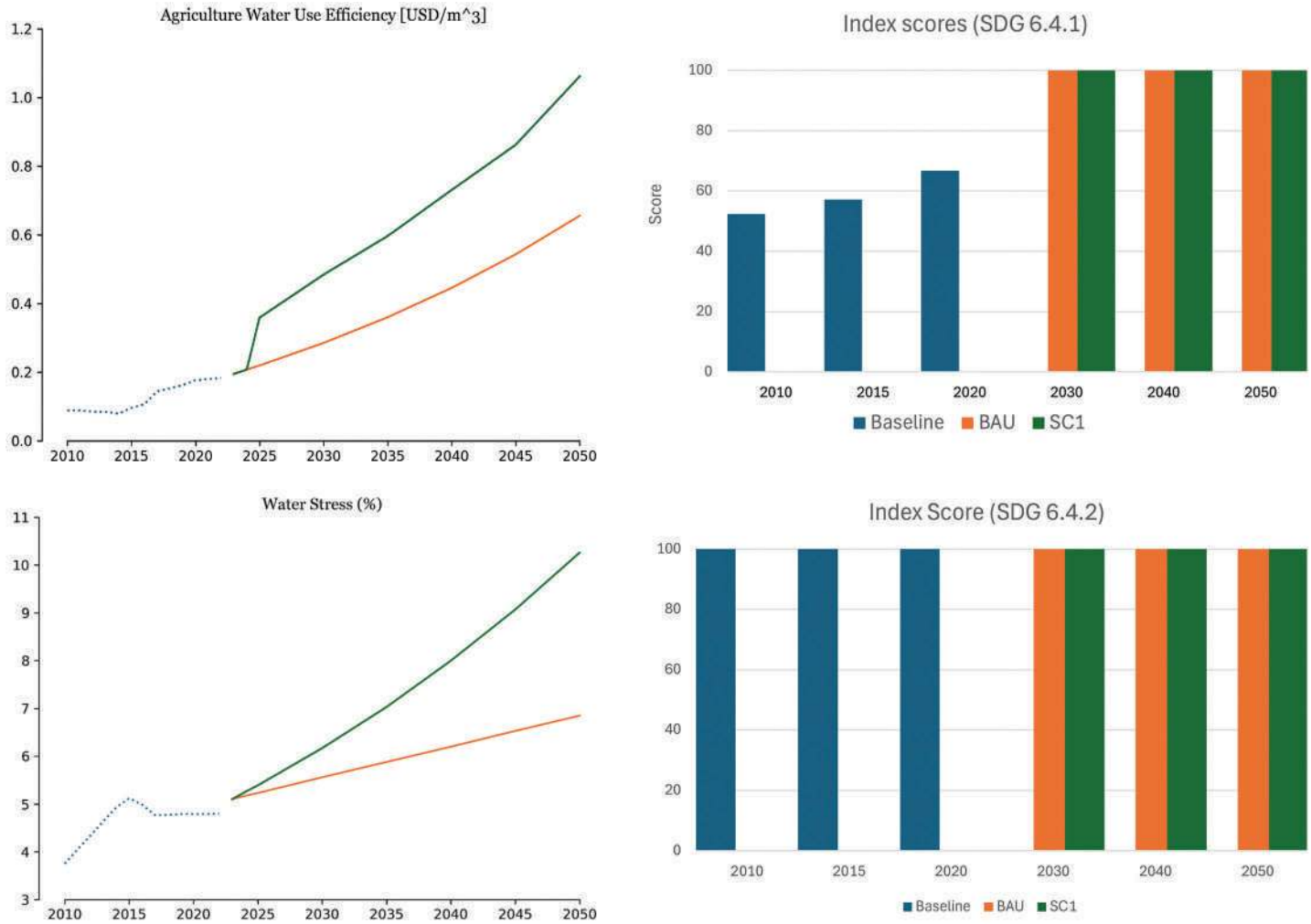


Figure 44. Selected results from the GGSim AFOLU model for Lao PDR's adaptation measures



(SDG 2.4.1), water use efficiency over time (SDG 6.4.1), level of water stress: freshwater withdrawal as a proportion of available freshwater resources (SDG 6.4.2), etc. These indicators are included in the Lao PDR Green Growth Index and provide knowledge on how they will change in 2050 due to policy changes.

Main Outputs:

- Technical report on the SDG co-benefits of adaptation measures in Lao PDR

Business-As-Usual (BAU) and the alternative scenario (SC1) were applied based on the Lao PDR National Development Plan and the Agricultural Sectoral Development Plan. The SC1 scenarios for the GGSim AFOLU model include the following: Change in fertilizer use by -55% and in crop yields by +30%, reforestation rate of fallow land by 10%, and reduction of methane in rice cultivation by 45% in 2050. The AFOLU model results revealed that the SC1 scenario will positively impact the increase in the share of forest area to total land area (SDG 15.1.1), which is expected to decline by 13 percent under the BAU scenario (Figure 43). The increase in forest area will have co-benefits on forest carbon stock, which will increase in value in the SC1 scenario. The nutrient balance measures the difference between the amount of nitrogen input into the soil and the crop output. In the BAU, the nutrient balance (SDG 2.4.1) will increase by up to 27 kilograms of Nitrogen per hectare (kgN/ha) in 2050, which can endanger soil health through nutrient pollution. In contrast, the nutrient balance will decrease below zero in the SC1 scenario, leading to soil impoverishment. The Green Growth Index score for SDG 5.1.1, with the SDG target of 17 percent, will not change in the SC1 scenario because Lao PDR's share of forest area to total land area has already been achieved in the BAU. In contrast, the Index score for SDG 2.4.1 will show further improvement, reaching the target of 5 kgN/ha in 2040 and until 2050. Under the BAU scenario, SDG 2.4.1 will follow a declining trend.

The SC1 scenarios for the GGSim Water use model include the following: Irrigated arable land will increase to 287.8 thousand hectares in 2020 and 306.1 thousand hectares in 2050, cropping intensity will rise to 12.2 percent in 2020 and 14.5 percent in 2050, and irrigated harvested area will expand by 363.5 thousand hectares in 2020 and 435.9 thousand hectares in 2050. The water use model results showed that water use efficiency (SDG 6.4.1) in

Figure 45. SO1.1. Reduced GHG emissions from the energy sector, including transport

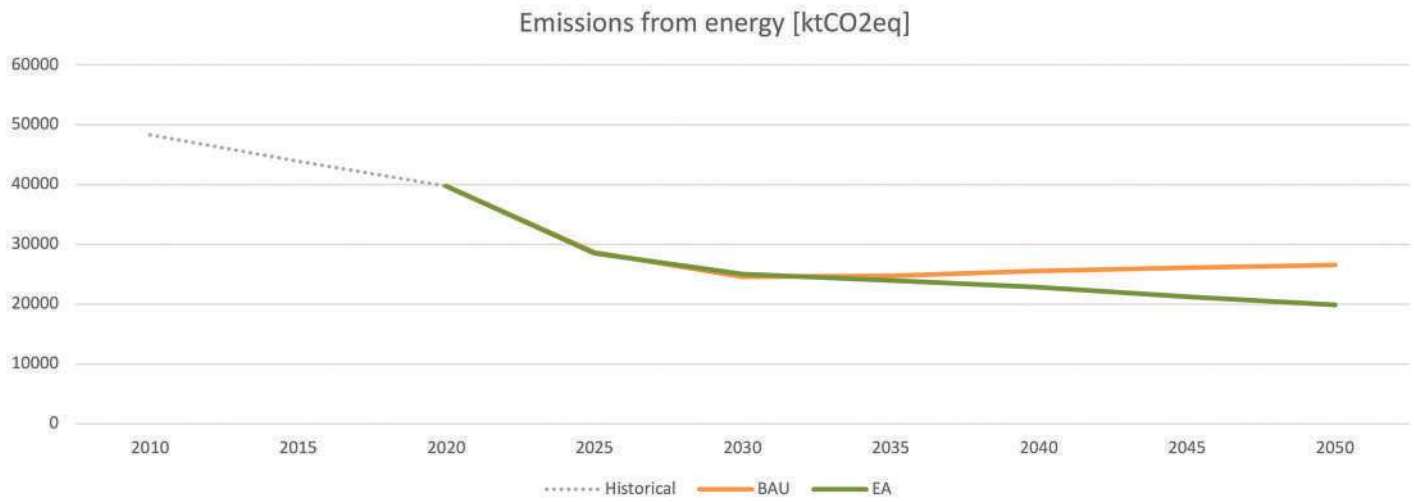
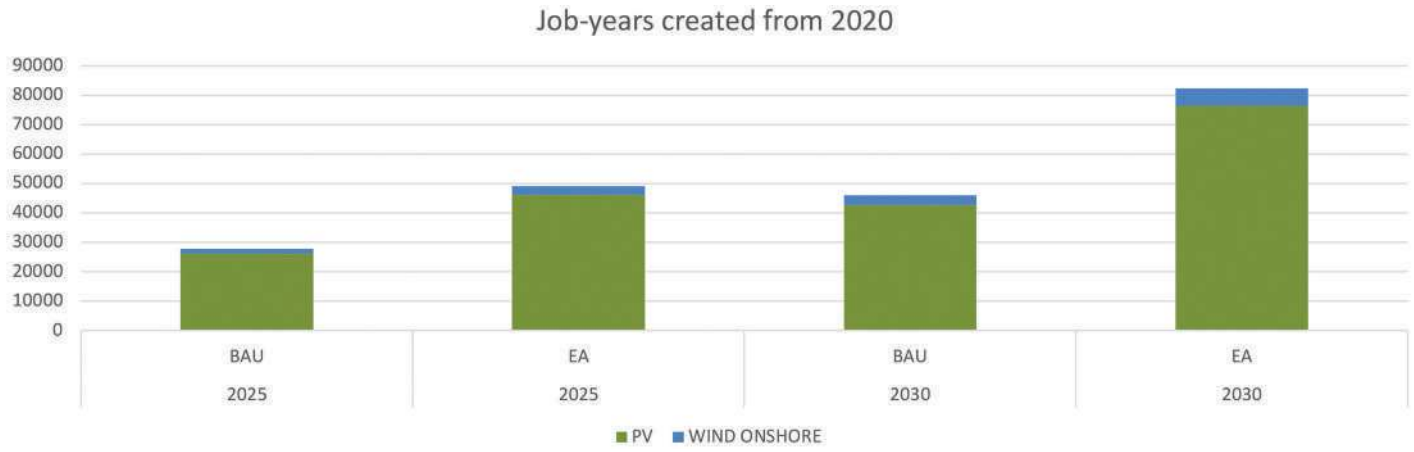


Figure 46. SO2. Number of green employment created from 2020 from solar PV and wind turbines



the agricultural sector will improve significantly under the SC1 scenario, reaching a value more than four times higher than the baseline (Figure 44). The target for SDG 6.4.1, which is 0.21, will be achieved for both BAU and SC1 scenarios. However, the total renewable freshwater resources per capita will decrease significantly in the SC1 scenario compared to the BAU scenario, with a negative co-benefits (or trade-offs) impact on the water availability per capita, decreasing by more than half by 2050. Freshwater withdrawal as a proportion of the available freshwater resource (SDG 6.4.2) will increase under the SC1 scenario, but the water stress levels will remain within the acceptable 25-75 percent threshold.[160] The Green Growth Index score for SDG 6.4.2 will not be significantly impacted, i.e., the Lao PDR will continue to achieve the target for SDG 6.4.2 in the BAU and SC1 scenarios.

7.1.4 GGSim application for assessing the Strategic Outcomes (SOs)

Collaborators: GGPM Team, Climate Action and Inclusive Development (CAID)

Duration: September – December 2024

Objectives: Climate policies are increasingly emerging worldwide in response to accelerated efforts to meet the Paris Agreement targets and the Sustainable Development Goals (SDGs) outlined in the UN's 2030 Agenda. Evaluating whether adequate actions are being taken to support these policies is essential. The Climate Action and Inclusive Development (CAID) Unit at GGGI reviewed existing methodologies for assessing the impact of climate policies, with a focus on GGGI's policy advisory services. In this context, the GGSim was applied to Hungary to simulate the potential impacts of the country's National Clean Development Strategy (NCDS) 2020-2050 on various sustainability outcomes in the energy, AFOLU, and water sectors.

Main Outputs:

- Technical report: The Role of Ex-Ante Impact Assessments in Shaping Climate Policy
- Improving the GGSim to include an optimization model for energy and circularity models for materials, water, and waste

Two scenarios were built based on the scenarios included in the NCDS: the BAU and Early Action (EA) scenarios. These scenarios achieve a sharp decrease in emissions from 2020 to 2030 (Figure 45). However, the emissions start increasing again in the BAU scenario, whereas the decrease continues in the EA scenario, reaching about 20 $MtCO_2eq$ in 2050. This is still far above the net-zero target, highlighting the need for further measures. Additional measures in the EA scenario include deploying solar and wind technologies for electricity generation, deploying heat pumps for heating, increasing electricity and biofuel consumption in the transport sector, and using H2 in the heating and transport sector. The deployment of solar PV and wind turbines will lead to the creation of green jobs in the country (Figure 46). Green jobs in the energy sectors are categorized into four categories: construction and installation, manufacturing, operation and maintenance, and fuel production. Compared to the BAU scenario, the EA scenario will create more than an additional 36,000 job years, most of which can be attributed to the deployment of PV. The large increase in solar energy will also increase the share of electricity generated from renewables. This indicator will exceed 80 percent in the EA scenario and remain under 50 percent in the BAU scenario.

7.1.5 Data and AI for Green Growth Phase I

Collaborators: GGPM Team; GGGI AI Task Force

Duration: March – June 2024

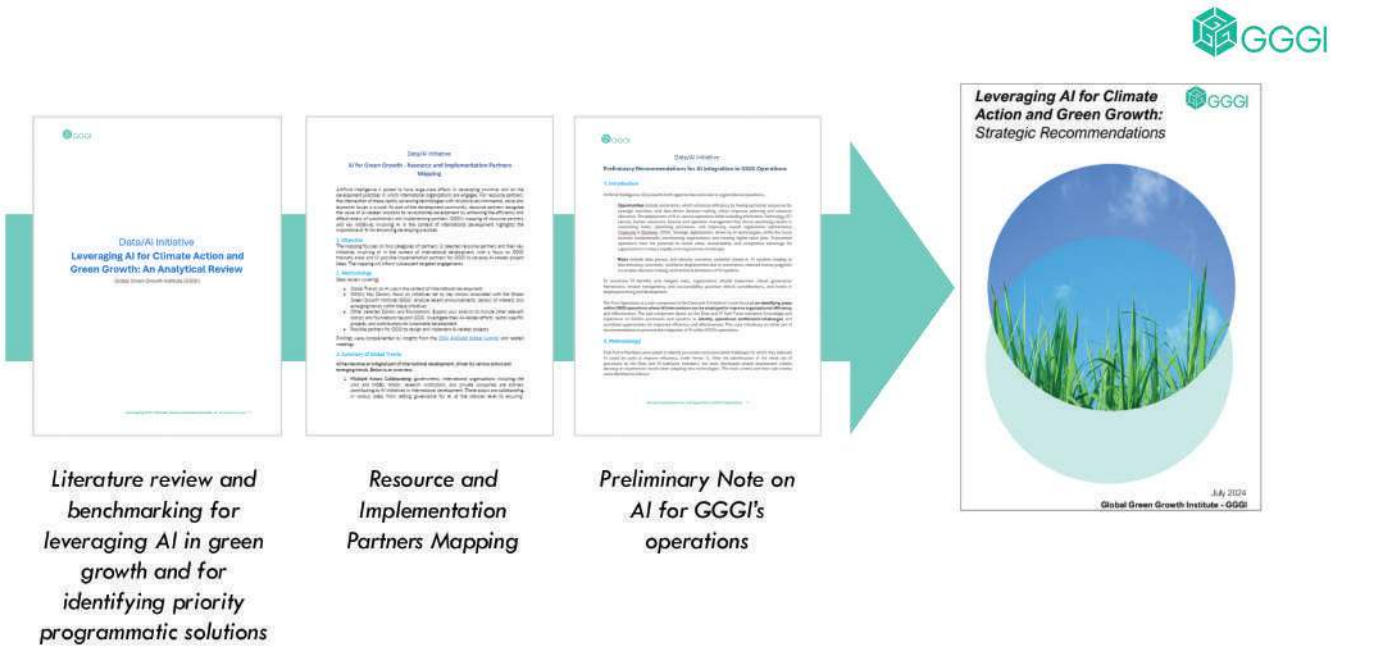
Objectives: Through the Data and AI Initiatives for Green Growth Project, GGGI is conducting various AI-related initiatives: (1) identifying and managing critical data for AI; (2) accelerating Green Growth and supporting GGGI's operations using AI; and (3) implementing AI pilot projects. The project's task force provided recommendations and identified key activities for GGGI's Programmatic Solutions during Phase 1. The pilot projects include six mature and three incubation ideas for implementation until mid-next year. Among the mature ideas are the Development of AI-powered knowledge Solutions for Green Growth, Optimizing the productivity of tea plantations in Sri Lanka using an AI-based prediction model, AI-supported Green Growth Simulation (GGSim) Tool for Assessing Gender Inclusive-ness in Africa, and Deep Learning-Based Now-casting of Extreme Weather Events using GOES Data. The GGSim, one of GGGI's in-house developed tools, was one of ITU's winning use cases presented during the AI for Good Summit (photo below). During the Global Green Growth Week in October 2024, the AI for Green Growth and Sustainable Futures session discussed topics on "Global Initiatives—Promoting Safe, Secure, Trustworthy AI for Sustainable Development" and "Projects on the Ground—AI for Climate Action and SDGs."

Main Outputs:

- Draft technical report on Data/AI Initiative Leveraging AI for Climate Action and Green Growth: An Analytical Review
- Resource and Implementation Partners Mapping
- AI for Green Growth and Sustainable Futures session during the 2024 Global Green Growth Week

The AI Task Force's strategic recommendations for leveraging AI for climate action and green growth from Phase 2 are guiding the implementation of the project's

Figure 47. Deliverables from the Data and AI Initiative Phase I Project



Phase 2 (Figure 47). Integrating Artificial Intelligence (AI) technologies in green growth domains holds the potential for positive climate impact and productivity gains worldwide. From energy systems to transportation, urban planning to natural resource management and circular economy, and agriculture to climate prediction, AI offers promising solutions to reduce greenhouse gas (GHG) emissions and enhance sustainability. The transformative power of AI lies in its ability to optimize processes, predict outcomes, and foster informed decision-making, ultimately leading to tangible reductions in energy consumption and emissions across multiple sectors. However, data availability, environmental impact, infrastructure investment, and algorithm safety must be addressed. Furthermore, ensuring AI's equitable, safe, and responsible development and deployment is paramount for maximizing its benefits while minimizing risks.

Considering this, to leverage AI opportunities for climate action and green growth, the AI Task Force's approach consisted of conducting a methodology for selecting Programmatic Solutions (PS) for effective AI interventions using the Weighted Sum Method (WSM). The Community of Practice (COP) leads, and AI experts were consulted to support and validate the values. Criteria such as development challenges, impact potential, accessibility, feasibility, data availability, regulatory framework, and best practices were assessed. Following this methodology, the top PS for applying AI include sustainable energy, sustainable mobility, green investments, climate action, sustainable forests, and climate-resilient agriculture, indicating their high potential to leverage AI for impactful climate action and green growth.

7.1.6 UAE Air Quality and Health Impact Assessment

Collaborators: GGPM Team, UAE Country Office Team, Ministry of Climate Change and Environment (MOCCAE)

Duration: April – December 2024

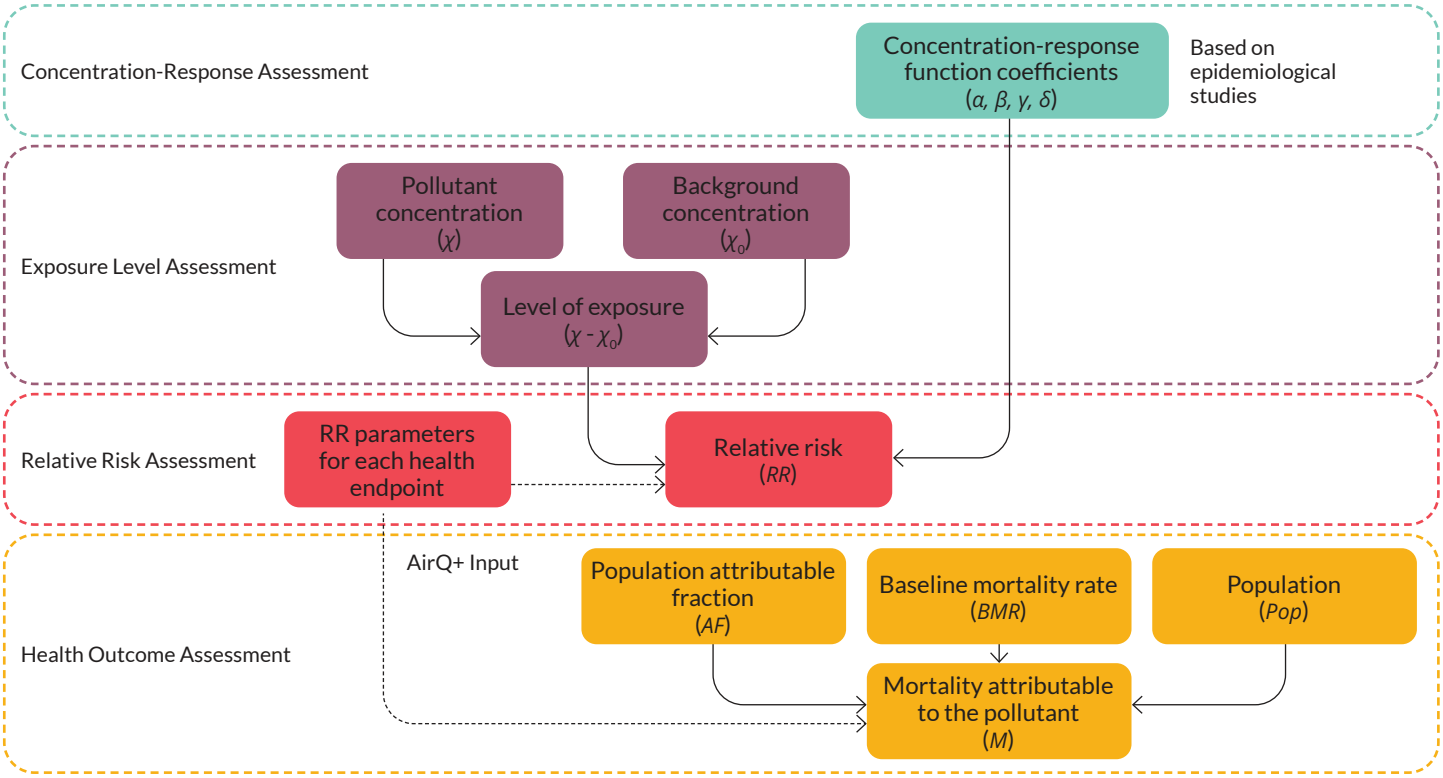
Objectives: To enhance the ability of the Ministry of Climate Change and Environment (MOCCAE) to safeguard the health and well-being of the population, the MOCCAE has identified as a priority for 2024 the development of a robust national indicator to measure and track the impact of air quality/pollution on public health outcomes within the UAE, to strengthen informed policy decision-making. Over the past 5 years, the UAE has recognized ambient air pollution as a critical concern for health and the overall quality of life. Through the MOCCAE, the government of the UAE has taken crucial steps towards improving air quality in the country. With GGGI's technical support, the MOCCAE developed the "Guideline for Environmental Burden of Disease (EBD) to Assess Outdoor Air Pollution Health Impacts in the United Arab Emirates" to achieve its objectives.

Main Outputs:

- Guideline for Environmental Burden of Disease (EBD) to Assess Outdoor Air Pollution Health Impacts in the United Arab Emirates

The Guideline presents the EBD concept, methods, and applications to assess the long-term health impacts of

Figure 48. Analytical approach to assess outdoor air pollution health impacts



outdoor air pollution in the United Arab Emirates. It discusses the conceptual framework and definitions related to the burden of diseases and provides previous applications of the concept in the UAE and the Middle East region. Due to its relevance to applying the EBD concept, an overview of the WHO's AirQ+ tool is also presented. The guideline also explains the framework, methods, and data used to estimate the burden of diseases in estimating mortality due to high air pollution concentration. Methods for the burden of diseases have become increasingly intricate, so the Guideline explains the stepwise approach to implementing the methods based on available data.

Calculating the EBD in the Guideline follows the comparative risk assessment (CRA) approach, which has been applied in the Global Burden of Disease (GBD) and many other scientific studies. The relative risks (RR) used in the AirQ+ tool also align with the CRA approach. The approach estimates expected health outcomes, including mortality, morbidity, and DALYs, and their distribution in the population. Figure 48 presents the stepwise calculations of the attributable burden for mortality due to outdoor air pollution exposure. The steps can be grouped into four assessments: concentration-response, exposure, relative risk, and health outcome. The concentration-response function (CRF), based on epidemiological studies in different countries and regions, assesses the statistical relationship between exposure to air pollutants and short- and long-term health outcomes. The level of exposure is assessed using pollutant concentration (X), data collected from monitoring stations, and background concentration (X0), which is the threshold at which the pollutant can be considered harmful. The relative risk (RR) captures the increase in mortality and morbidity attributed to a given increase in air pollutant concentration. The EBD assesses health outcomes such as mortality and morbidity attributable to the pollutant based on population-attributable fraction (AF), baseline mortality rate (BMR), and total exposed population (P). The data required for the calculations include air pollutant concentration, background concentration, relative risk, mortality or morbidity, demographic information (age, gender), and population exposed to the pollutant.

7.2 Ongoing projects 2024-2025

7.2.1 Togo National Green Growth Index

Collaborators: GGPM Team; GGGI Togo Country Office, Institut National de la Statistique et des Etudes Économiques et Démographiques, and Ministry of Planning, Development and Cooperation

Duration: August 2024 – February 2025

Objectives: GGGI is supporting the Government of Togo in developing its National Green Growth Index, with 49 experts from 32 institutions participating, primarily from government institutions. The first participatory workshop was held on November 28-29, 2024, during which the experts discussed and provided ratings on the policy relevance of various green growth indicators (Figure 49). The participatory approach to developing the Green Growth Index allows the experts to align the indicators with Togo's national priorities and policies. The breakout discussions during the first workshop suggested approximately ten green growth indicators for each sustainability pillar. Some of these indicators lack data and will require proxy variables to enable the computation of the Index. The next step before the second participatory workshop will be for the experts to validate the proxy variables identified by the GGPM Team. During the second workshop, the experts will assess the results of the Green Growth Index, highlighting the opportunities and challenges in Togo's green growth transition. The assessment will be integrated into the Togo Green Growth Index report, scheduled for publication in 2025.

Main Outputs:

- Togo Green Growth Index report and website
- Capacity building on applying the Index in policy and planning

7.2.2 GRAP Green and Inclusive Gender Index

Collaborators: GGPM Team;

Duration: June 2024 – February 2025

Objectives: GGGI collaborates closely with the African Union Commission (AUC) and the African Capacity Building Foundation (ACBF) to develop the African Green and Inclusive Gender Index. The Index is part of the Transformative Climate Finance Program of the AU-GRAP (TCFP AU-GRAP) and funded by Global Affairs Canada (GAC). Developing the regional index is an opportunity to enhance South-South knowledge and insights exchange to ensure that the Index development process is accurate, relevant, and effective for better decision-making and policy development. A two-day consultation workshop was held at the African Union Commission in Addis Ababa, Ethiopia, on July 30 – 31, 2024 (Figure 50), to socialize the GIGI framework and indicators with key stakeholders to incorporate diverse regional perspectives and ensure context-specific relevance. The regional consultation workshop convened experts from the Regional Economic

Communities (RECs) and international partners to discuss the development of the Green and Inclusive Gender Index, which aims to support policymakers in measuring and accelerating progress toward gender and social inclusion in green growth. The RECs include the Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC), Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), Southern African Development Community (SADC), and UMA (Maghreb Arab Union). Experts from the United Nations Economic Commission for Africa (UNECA), UN Women, and African Risk Capacity also participated in the workshop. The AUC was represented by the Women, Gender, and Youth Directorate (WGYD) and the Sustainable Environment and Blue Economy (SEBE) Directorate.

The Climate Change Unit Interim Head delivered the welcome remarks on behalf of Director Harsen Nyambe Nyambe, Director of Sustainable Environment & Blue Economy (SEBE), and Dr. Malle Fofana, the GGGI Director and Head of Programs in Africa. The SEBE Director emphasized the importance of inclusive and equitable green growth in Africa, particularly with the COVID-19 pandemic that has heightened poverty and inequality in many parts of the continent. Nyambe referred to the African Union-Green Recovery Action Plan as a framework geared towards a Green and Resilient Recovery consistent with the African Union Agenda 2063. He further highlighted the importance of regional collaboration through African Regional Consultations to share the continental vision of green recovery and Sustainable development. Nyambe stressed that the regional consultation workshop for developing the Green and Inclusive Gender Index is a platform that will support measuring progress and reflecting on varied experiences throughout the continent. Nyambe called for active participation in determining the future of Africa's green growth and strongly insisted that women, youth, and marginal populations are represented. He closed the speech with a call to action for stakeholders to consult to make an impactful change for Africa toward promoting sustainable development.

Dr. Malle Fofana, who joined the workshop virtually, underscored the organization's commitment during the last decade to promote green and just transitions across Africa. He also emphasized that regional collaboration and partnerships—especially with Global Affairs Canada, the African Union, and the Africa Capacity Building Foundation—have successfully implemented the AU Green Recovery Action Plan. It aims to coherently integrate economic growth, environmental sustainability, and social inclusion, especially for women and the youth, post-COVID-19, seeking economic and climate resilience. He also spoke about the importance of the Green and Inclusive Growth Index—as an important tool for monitoring and evaluating green growth strategies in various settings—underscoring the need to include equity and inclusion in development efforts at all levels.

Figure 49. Experts participating in the first workshop for the Togo Green Growth Index

Figure 50. Experts participating in the first workshop for the Green and Inclusive Gender Index

Main Outputs:

- Green and Inclusive Gender Index report and website
- Gender indicators for implementing the AI models for Gender inclusiveness

7.2.3 AI Pilot Project – Gender Inclusiveness in Africa

Collaborators: GGPM Team; GRAP, GESI, and ARO Teams; University of Pannonia

Duration: September 2024 - June 2025

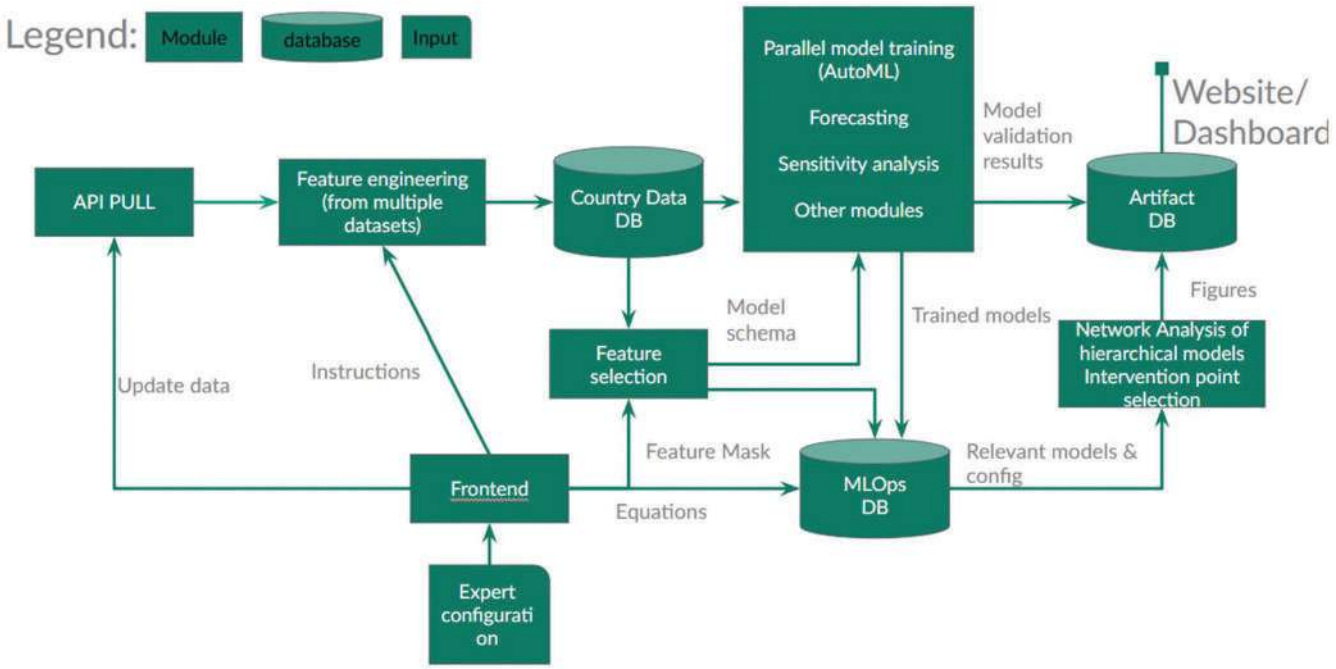
Objectives: The project will develop AI models for SDG gender indicators that lack data and system dynamics models to allow for the assessment of co-benefits from mitigation and adaptation actions. It will further improve the SDG coverage of the AI-supported Green Growth Simulation Tool, which GGGI applies to estimate SDG co-benefits in LT-LEDS, NDCs, and NAPs, as well as other strategic policy frameworks such as the Gender-Responsive Roadmap. The project will contribute to developing a Gender-Responsive Roadmap for Africa, providing scenario analysis for gender actions and measures.

The AI Models for estimating gender responsiveness will be integrated into GGGI's Green Growth Simulation Tool (GGSim), which the GGPM developed to assess SDG alignment and estimate SDG co-benefits of mitigation and adaptation measures in GGGI Member Countries and Partners' NDCs, LT-LEDS, and NAPs. GGSim was used to prepare the Burkina Faso and Ethiopia LT-LEDS and is currently being applied to support the development of the Lao PDR NAP.

Main Outputs:

- Online tool for the AI-supported Green Growth Simulation Tool
- Technical report on Gender Inclusiveness in Africa

Figure 51. Machine learning (ML) tool infrastructure for the AI-supported GGSim



The project will be developed and use AI-based models to assess and enhance gender inclusiveness across various African sectors. Using advanced AI capabilities (Figure51), this solution will analyze diverse data sources, such as socio-economic data, cultural norms, policy documentation, and historical records. By integrating machine learning, natural language processing (NLP), and deep learning techniques, the solution will provide detailed insights into gender disparities and offer predictive analytics to forecast future trends. These insights will be crucial for policymakers, NGOs, and businesses to design effective interventions and promote gender equality. Data and AI will help solve these problems and capture opportunities by identifying gaps and disparities, informing policy formulation, and empowering advocacy efforts. AI will analyze large datasets to uncover patterns and trends that might not be visible through traditional analysis methods. For instance, predictive models will forecast the impact of proposed policies on gender inclusiveness, enabling policymakers to design targeted measures and monitor their outcomes.

7.2.4 Data and AI for Green Growth Phase II – Component 2.1

Collaborators: GGPM Team; Partnership and Strategy Teams

Duration: July 2024 - June 2025

Objectives: The Data and AI for Green Growth Phase II Project consists of three components, including (1) Data management, (2) AI for Green Growth and AI in operations, and (3) GGGI AI pilot projects. The AI for Green Growth, component 2.1, aims to identify opportunities and define project concept/s on AI for green growth and climate action. AI is recognized as a technology that can help facilitate green transitions in key sectors for the climate, both from a policy planning perspective and implementation. Integrating AI-powered systems in GGGI's services could help Members accelerate transitions by, for instance, delivering more impactful insights to the right policymakers. The growing interest in AI and its applications at the country and global levels for the benefit of climate action and the environment may result in donor funding opportunities for projects. Selecting which programmatic solutions will be catalyzed using AI and applied in a developing country context will help focus GGGI's efforts and generate ideas.

Main Outputs:

- Bi-monthly digest of AI and AI and Green Growth-related news
- One Technical Report on AI for Green Growth
- At least one project concept note

The specific objectives under component 2.1 include the following:

1. Identify a selection of the existing GGGI service offerings (programmatic solutions and projects) that could be best suited to benefit from the use of AI
2. Identify donors interested in promoting the AI for climate/ environment topics and develop a first set of project concept/s for resource mobilization,
3. Start positioning GGGI as a possible partner for climate/ environment-related AI applications

To achieve these objectives, the team will identify sectors with existing AI applications for green growth and climate

action, focusing on applications that can suit a developing country context. Moreover, it will develop a mapping of donors with possible interest in funding projects related to using AI for natural resources management, climate change mitigation, and adaptation. Focus group discussions with COP leads will be conducted to select a limited array of GGGI programmatic solutions where the application of AI is most promising / most advanced and where donors have shown interest. The team will identify technical partnerships needed to deliver on AI and environment/climate-related projects (tech. skills, data) and engage in Data/AI environment and development-related platforms (participation in the AI for Good Summit 2025, etc.).

7.2.5 Jordan Sectoral Green Growth National Action Plans (GG-NAP)

Collaborators: GGPM Team, Jordan Country Office Team, Ministry of Environment (MOE)

Duration: August 2023 – December 2025

Objectives: The Government of Jordan has given priority to green growth in national plans and strategies, including the Economic Modernization Vision, which brings forward sustainability as a primary economic growth pillar, as well as the NDC, where Jordan raised its conditional GHG emission reduction target, to 31 percent compared to the baseline scenario by 2030. GGGI has also been a key partner to the Jordan Government on sustainability planning by supporting the development of the National Green Growth Plan for Jordan in 2019, which was then further developed into six sectoral Green Growth National Action Plans (GG-NAPs) for the period 2021-2025. The GG-NAPs identify key actions to accelerate green growth over 2021-2025 in 6 priority sectors: energy, water, transport, waste, agriculture, and tourism. The actions include projects and policy recommendations and consider how the distribution of benefits of economic development can be improved across different genders, social groups, and regions. An estimated cost for each intervention is noted in addition to a cost-benefit analysis for each sector's top 4 priority actions, selected after comprehensive stakeholder

consultations facilitated by the Jordanian Ministry of Environment (MOE). The sectoral GG-NAPs are one of the high-profile achievements of the GGGI Jordan office, which helped establish GGGI's presence as a reliable partner for high-impact policy planning in Jordan.

As the end of the implementation period of GG-NAP is approaching, MOE is seeking a better understanding of the status of GG-NAP implementation. GGGI's assistance was requested to provide support, including reviewing the level of implementation for each of the six sectoral GG-NAPs (taking into consideration impacts on gender and poverty alleviation), developing an index to measure green growth transition, and updating the six sectoral GG-NAPs for the next 5 years. The project is divided into two Phases. Phase 1 aims to improve understanding of the effectiveness of the GG-NAP across sectors and evidence-based recommendations to enhance future green growth planning. Its activities and deliverables will support the implementation of Phase 2, which aims to develop the Jordan Green Growth Index and update the sectoral GG-NAPs.

8 Statistical Tables

8.1 Green Growth Index and dimension scores by subregion

Table 8. Green growth dimension sub-indices and Green Growth Index and ranks for the African countries

African Countries/ Territories	Africa Subregion	Dimensions				Green Growth Index		
		Efficient and Sustainable Resource Use	Natural Capital Protection	Green Economic Opportunities	Social Inclusion	Scores	Level	Rank
Gabon	Middle	73.50	74.58	41.46	55.46	59.58	Moderate	1
Mauritius	Southern	61.76	53.37	45.86	78.98	58.78	Moderate	2
Seychelles	Eastern	50.50	78.77	33.97	77.65	56.91	Moderate	3
Togo	Western	59.20	68.47	46.68	53.48	56.40	Moderate	4
Cabo Verde	Eastern	46.79	61.75	45.17	71.48	55.27	Moderate	5
Namibia	Western	57.09	63.38	37.09	67.50	54.86	Moderate	6
Cote d'Ivoire	Western	69.91	66.13	39.25	49.25	54.67	Moderate	7
Gambia	Eastern	59.95	63.57	41.39	56.59	54.66	Moderate	8
Burkina Faso	Eastern	63.51	68.94	50.44	37.18	53.53	Moderate	9
Zambia	Middle	59.27	70.02	42.95	45.63	53.40	Moderate	10
Guinea	Southern	52.22	67.04	45.97	47.11	52.47	Moderate	11
Tanzania	Eastern	62.35	65.84	35.61	51.68	52.43	Moderate	12
Cameroon	Eastern	60.01	60.97	35.80	55.06	51.82	Moderate	13
South Africa	Western	36.98	63.87	42.96	69.81	51.59	Moderate	14
Benin	Eastern	61.86	63.66	42.40	41.71	51.37	Moderate	15
Uganda	Western	65.08	71.27	30.32	47.27	50.78	Moderate	16
Botswana	Western	72.00	63.23	22.54	63.16	50.45	Moderate	17
Lesotho	Western	49.54	49.82	47.04	55.78	50.45	Moderate	18
Senegal	Western	56.22	64.88	30.62	57.58	50.36	Moderate	19
Zimbabwe	Eastern	48.35	74.70	34.34	49.80	49.85	Moderate	20
Malawi	Eastern	62.13	73.93	28.34	47.04	49.75	Moderate	21
Kenya	Southern	57.66	61.96	30.26	55.29	49.45	Moderate	22
Burundi	Northern	60.19	67.33	35.35	39.54	48.79	Moderate	23
Ethiopia	Eastern	59.29	68.40	32.53	41.48	48.37	Moderate	24
Mali	Western	60.74	61.83	30.89	46.76	48.26	Moderate	25
Rwanda	Southern	65.96	69.31	21.41	53.88	47.92	Moderate	26
Mozambique	Middle	54.63	67.05	34.83	40.65	47.72	Moderate	27
Ghana	Eastern	58.51	65.08	23.56	54.60	47.05	Moderate	28
Morocco	Western	45.88	66.09	23.35	64.70	46.26	Moderate	29
Tunisia	Eastern	29.17	60.73	35.04	73.01	46.14	Moderate	30
Sierra Leone	Western	65.59	59.92	31.98	35.99	46.12	Moderate	31
Mauritania	Western	62.66	36.60	47.04	39.91	45.55	Moderate	32
Nigeria	Northern	59.05	58.47	22.29	44.69	43.06	Moderate	33
Central African Republic	Northern	64.80	55.54	33.50	28.02	42.87	Moderate	34
Algeria	Western	27.08	51.58	31.76	73.83	42.54	Moderate	35
Angola	Northern	66.43	58.48	20.82	40.07	42.43	Moderate	36
Madagascar	Eastern	58.30	58.07	22.42	40.18	41.79	Moderate	37

Table 8. Green growth dimension sub-indices and Green Growth Index and ranks for the African countries *(continued)*

African Countries/ Territories	Africa Subregion	Dimensions				Green Growth Index		
		Efficient and Sustainable Resource Use	Natural Capital Protection	Green Economic Opportunities	Social Inclusion	Scores	Level	Rank
Egypt	Western	22.51	55.84	35.65	66.42	41.53	Moderate	38
Niger	Middle	59.69	51.35	19.40	35.24	38.05	Low	39
Sudan	Northern	27.28	50.97	32.47	40.72	36.83	Low	40
Libya	Northern	27.06	29.01	25.38	65.94	33.85	Low	41
Eswatini	Southern	29.00	58.87	-	64.41	-	-	-
DR Congo	Middle	62.55	69.78	-	30.19	-	-	-
Chad	Middle	63.60	53.33	-	24.52	-	-	-
Comoros	Eastern	68.74	60.72	-	52.68	-	-	-
Congo Republic	Middle	65.23	73.25	-	44.18	-	-	-
Djibouti	Eastern	58.38	38.87	-	50.96	-	-	-
Guinea-Bissau	Western	57.87	66.27	-	30.43	-	-	-
Liberia	Western	53.85	56.07	-	35.81	-	-	-
Sao Tome and Principe	Middle	70.27	71.60	-	56.69	-	-	-
Somalia	Eastern	58.13	48.29	-	34.95	-	-	-
South Sudan	Eastern	67.88	62.47	-	28.86	-	-	-
Equatorial Guinea	Middle	62.25	59.30	-	36.94	-	-	-
Eritrea	Eastern	67.92	46.85	-	42.92	-	-	-

Table 9. Green growth dimension sub-indices and Green Growth Index and ranks for the American countries

American Countries/ Territories	America Subregion	Dimensions				Green Growth Index		
		Efficient and Sustainable Resource Use	Natural Capital Protection	Green Economic Opportunities	Social Inclusion	Scores	Level	Rank
United States	Northern	54.87	63.07	54.69	85.68	63.46	High	1
Paraguay	South	64.48	66.50	50.12	72.77	62.88	High	2
Brazil	South	62.96	71.38	43.49	75.50	61.98	High	3
Chile	Central	51.40	74.34	44.08	83.07	61.16	High	4
Uruguay	Northern	64.06	60.79	41.89	84.14	60.87	High	5
Costa Rica	South	55.17	72.26	44.81	76.77	60.86	High	6
Panama	Caribbean	59.08	75.60	42.56	71.80	60.78	High	7
Canada	South	53.57	59.46	45.07	91.08	60.13	High	8
Jamaica	Central	52.87	67.83	47.53	73.90	59.57	Moderate	9
Mexico	South	48.08	73.57	44.98	79.04	59.55	Moderate	10
El Salvador	South	55.19	64.50	45.15	71.11	58.14	Moderate	11
Bolivia	Central	52.80	71.97	38.24	78.52	58.12	Moderate	12
Venezuela	Central	53.83	70.75	41.83	70.09	57.80	Moderate	13
Suriname	South	51.64	64.42	47.61	69.66	57.63	Moderate	14
Colombia	South	56.10	71.79	39.73	68.91	57.62	Moderate	15
Nicaragua	South	56.31	69.77	39.03	70.78	57.39	Moderate	16
Argentina	South	55.45	60.33	39.76	80.52	57.21	Moderate	17
Dominican Republic	South	60.06	75.06	35.39	66.10	56.98	Moderate	18
Ecuador	South	53.95	70.63	36.99	70.74	56.20	Moderate	19
Peru	Central	56.42	71.45	36.38	67.88	56.17	Moderate	20
Guatemala	Caribbean	58.65	66.55	40.47	60.12	55.51	Moderate	21
Honduras	Central	57.31	72.74	37.14	54.77	53.96	Moderate	22
Guyana	Central	53.21	62.20	33.39	75.08	53.67	Moderate	23
Belize	Central	55.70	72.15	28.68	64.98	52.31	Moderate	24
Trinidad and Tobago	Caribbean	31.16	54.16	50.76	77.93	50.83	Moderate	25
Barbados	Caribbean	35.89	58.98	36.01	70.52	48.15	Moderate	26
Antigua and Barbuda	Caribbean	60.69	63.88	-	61.25	-	-	-
Bahamas	Caribbean	55.81	67.66	-	58.58	-	-	-
Dominica	Caribbean	69.10	67.40	-	68.62	-	-	-
Grenada	Caribbean	63.92	61.54	-	72.34	-	-	-
Haiti	Caribbean	55.08	52.64	-	38.26	-	-	-
St. Kitts and Nevis	Caribbean	54.40	67.25	-	67.79	-	-	-
St. Lucia	Caribbean	60.33	72.52	-	72.47	-	-	-
St. Vincent and the Grenadines	Caribbean	66.41	72.65	-	62.07	-	-	-
Cuba	Caribbean	61.32	66.53	-	-	-	-	-
Puerto Rico	Caribbean	62.82	50.23	-	-	-	-	-
Bermuda	Northern	61.76	59.10	-	-	-	-	-
Greenland	Northern	-	45.51	-	-	-	-	-
United States Virgin Islands	Caribbean	-	51.53	-	-	-	-	-

Table 10. Green growth dimension sub-indices and Green Growth Index and ranks for the Asian countries

Asian countries/ Territories	Asia Subregion	Dimensions				Green Growth Index		
		Efficient and Sustainable Resource Use	Natural Capital Protection	Green Economic Opportunities	Social Inclusion	Scores	Level	Rank
Japan	Eastern	61.70	73.71	47.33	78.42	64.10	High	1
Laos	Western	61.78	76.47	56.30	60.58	63.36	High	2
Georgia	Southern	52.75	73.67	49.59	80.52	62.76	High	3
China	South-eastern	53.60	63.61	56.85	76.83	62.12	High	4
Thailand	Eastern	54.80	73.40	48.35	74.63	61.72	High	5
Bhutan	South-eastern	56.91	79.85	52.04	59.90	61.35	High	6
Malaysia	South-eastern	52.39	67.52	54.26	69.65	60.47	High	7
Philippines	South-eastern	58.33	75.09	39.60	72.07	59.46	Moderate	8
Vietnam	Western	54.60	62.59	50.23	72.12	59.32	Moderate	9
Cyprus	Western	58.23	74.00	34.05	83.72	59.20	Moderate	10
Indonesia	South-eastern	54.39	64.50	47.28	67.13	57.77	Moderate	11
Maldives	Eastern	52.10	52.16	52.21	77.71	57.62	Moderate	12
Armenia	Western	40.08	69.80	48.41	78.55	57.11	Moderate	13
South Korea	South-eastern	37.12	57.85	58.31	82.03	56.61	Moderate	14
Kyrgyz Republic	Western	48.83	61.93	41.42	75.40	55.43	Moderate	15
Israel	Southern	48.14	48.69	45.81	85.95	55.12	Moderate	16
Azerbaijan	Southern	42.63	65.00	47.80	69.56	55.09	Moderate	17
Kazakhstan	Central	51.35	53.86	41.53	78.42	54.78	Moderate	18
Nepal	South-eastern	60.99	73.56	26.34	69.42	53.52	Moderate	19
United Arab Emirates	Central	36.72	47.88	53.72	84.14	53.10	Moderate	20
Brunei Darussalam	South-eastern	45.39	56.23	43.37	68.25	52.43	Moderate	21
Singapore	Western	28.85	59.39	50.25	83.85	51.83	Moderate	22
Cambodia	Central	56.28	78.06	26.14	61.75	51.60	Moderate	23
Tajikistan	Western	36.04	60.24	45.17	71.94	51.54	Moderate	24
Qatar	Western	46.61	39.98	55.98	66.24	51.27	Moderate	25
Myanmar	Southern	58.41	60.62	33.92	56.58	51.05	Moderate	26
Mongolia	Southern	44.34	55.07	35.07	76.23	50.55	Moderate	27
Sri Lanka	Southern	35.11	64.07	40.00	59.33	48.07	Moderate	28
Bangladesh	South-eastern	52.51	54.84	31.02	59.10	47.93	Moderate	29
Timor-Leste	South-eastern	62.74	64.81	16.41	74.88	47.28	Moderate	30
India	Eastern	39.21	54.35	35.11	59.95	46.02	Moderate	31
Palestine	South-eastern	47.27	32.83	51.75	53.71	45.57	Moderate	32
Jordan	Western	34.64	48.45	36.73	62.37	44.28	Moderate	33
Oman	Western	32.48	41.20	47.54	57.42	43.72	Moderate	34
Lebanon	Western	44.40	58.85	23.52	59.25	43.68	Moderate	35
Saudi Arabia	Southern	29.93	36.89	40.82	73.92	42.72	Moderate	36
Afghanistan	Western	44.65	54.98	33.47	37.05	41.77	Moderate	37
Iran	Southern	22.10	57.94	34.54	68.53	41.72	Moderate	38
Kuwait	Western	28.42	40.66	45.36	57.22	41.62	Moderate	39
Uzbekistan	Western	19.36	57.37	28.59	70.36	38.66	Low	40
Iraq	Western	33.88	37.56	29.18	58.68	38.42	Low	41
Pakistan	Southern	24.42	52.51	27.17	48.82	36.11	Low	42

Table 10. Green growth dimension sub-indices and Green Growth Index and ranks for the Asian countries *(continued)*

Asian countries/ Territories	Asia Subregion	Dimensions				Green Growth Index		
		Efficient and Sustainable Resource Use	Natural Capital Protection	Green Economic Opportunities	Social Inclusion	Scores	Level	Rank
Bahrain	Central	33.91	23.11	39.40	53.34	35.82	Low	43
Yemen	Western	31.25	40.15	25.54	29.12	31.08	Low	44
Syria	Western	12.85	41.19	-	53.60	-	-	-
Turkmenistan	Central	18.26	45.75	-	76.95	-	-	-
North Korea	Eastern	59.69	56.45	-	-	-	-	-
Turkey	Western	-	59.55	-	-	-	-	-
Hong Kong	Eastern	-	-	-	91.91	-	-	-
Macau	Eastern	-	-	-	83.88	-	-	-

Table 11. Green growth dimension sub-indices and Green Growth Index and ranks for the European countries

European Countries/ Territories	Europe Subregion	Dimensions				Green Growth Index		
		Efficient and Sustainable Resource Use	Natural Capital Protection	Green Economic Opportunities	Social Inclusion	Scores	Level	Rank
Switzerland	Western	82.02	80.12	57.01	94.53	77.14	High	1
Denmark	Western	78.42	73.71	61.16	94.67	76.06	High	2
Austria	Northern	79.64	80.41	53.13	94.59	75.32	High	3
Germany	Western	67.16	82.97	59.81	93.44	74.70	High	4
Czech Republic	Northern	77.42	81.96	52.25	91.27	74.17	High	5
Sweden	Eastern	79.49	78.43	48.98	95.59	73.50	High	6
Slovakia	Eastern	76.05	84.66	49.61	87.81	72.77	High	7
Finland	Northern	70.22	72.35	54.00	95.77	71.59	High	8
United Kingdom	Eastern	68.45	79.00	51.37	93.83	71.45	High	9
Belarus	Northern	60.66	78.82	56.90	90.28	70.40	High	10
Italy	Southern	65.03	80.38	46.98	91.75	68.90	High	11
Hungary	Western	66.93	81.84	47.89	85.38	68.80	High	12
France	Eastern	67.60	79.14	44.24	94.07	68.69	High	13
Netherlands	Northern	59.58	73.47	52.32	94.02	68.12	High	14
Estonia	Northern	65.28	77.51	46.38	91.74	68.12	High	15
Slovenia	Western	62.06	78.81	48.79	90.04	68.08	High	16
Norway	Northern	63.89	74.92	46.75	95.05	67.91	High	17
Lithuania	Southern	69.83	74.57	43.99	89.98	67.38	High	18
Portugal	Southern	64.28	79.51	42.86	93.35	67.25	High	19
Croatia	Eastern	65.21	83.78	41.36	90.40	67.23	High	20
Latvia	Western	71.95	78.52	39.30	90.58	66.96	High	21
Luxembourg	Western	73.96	77.64	36.88	92.79	66.58	High	22
Albania	Eastern	64.93	83.45	41.91	82.66	65.82	High	23
Spain	Southern	60.69	76.70	42.91	93.48	65.73	High	24
Poland	Northern	59.31	75.99	43.96	90.31	65.04	High	25
Belgium	Southern	51.34	77.04	47.29	95.52	65.01	High	26
Romania	Eastern	63.90	78.06	40.22	86.17	64.48	High	27
Bulgaria	Southern	52.62	80.54	42.48	86.73	62.86	High	28
Bosnia and Herzegovina	Southern	66.00	65.51	42.96	76.91	61.48	High	29
Macedonia	Southern	56.83	75.18	41.62	79.11	61.24	High	30
Serbia	Southern	61.77	69.44	40.10	81.27	61.14	High	31
Greece	Southern	62.87	77.84	30.46	89.44	60.43	High	32
Russia	Eastern	54.19	58.36	51.38	80.76	60.19	High	33
Moldova	Northern	59.83	74.00	32.50	85.98	59.31	Moderate	34
Ukraine	Eastern	55.86	72.78	39.62	74.78	58.91	Moderate	35
Ireland	Eastern	61.42	58.04	34.39	89.61	57.57	Moderate	36
Iceland	Northern	59.07	45.24	36.67	93.90	55.08	Moderate	37
Malta	Southern	45.62	74.23	28.41	86.91	53.77	Moderate	38
Montenegro	Southern	30.77	67.75	34.92	80.16	49.15	Moderate	39
Andorra	Southern	-	77.51	-	-	-	-	-
Liechtenstein	Western	-	87.41	-	-	-	-	-
Monaco	Western	-	18.09	-	-	-	-	-

Table 12. Green growth dimension sub-indices and Green Growth Index and ranks for the Oceania countries

Oceania Countries/ Territories	Oceania Subregion	Dimensions				Green Growth Index		
		Efficient and Sustainable Resource Use	Natural Capital Protection	Green Economic Opportunities	Social Inclusion	Scores	Level	Rank
New Zealand	Australia and New Zealand	60.39	68.99	40.80	95.54	63.48	High	1
Fiji	Melanesia	61.95	68.18	54.06	64.77	62.02	High	2
Australia	Australia and New Zealand	65.27	52.66	37.56	89.94	58.38	Moderate	3
Papua New Guinea	Melanesia	68.26	52.96	39.94	28.61	45.08	Moderate	4
Samoa	Polynesia	84.46	67.96	-	64.05	-	-	-
Tonga	Polynesia	63.16	63.23	-	69.41	-	-	-
Solomon Islands	Melanesia	77.02	52.29	-	46.26	-	-	-
Vanuatu	Melanesia	68.79	64.79	-	50.45	-	-	-
Kiribati	Micronesia	76.79	60.21	-	68.41	-	-	-
Micronesia, Fed. Sts.	Micronesia	61.25	60.72	-	58.16	-	-	-
Nauru	Micronesia	63.67	24.50	-	-	-	-	-
Tuvalu	Polynesia	73.11	72.92	-	-	-	-	-
New Caledonia	Melanesia	40.90	-	-	90.22	-	-	-
Marshall Islands	Micronesia	-	64.12	-	67.46	-	-	-
Palau	Micronesia	-	78.49	-	69.06	-	-	-
American Samoa	Polynesia	-	77.13	-	-	-	-	-
Guam	Micronesia	-	15.53	-	-	-	-	-
Northern Mariana Islands	Micronesia	-	72.34	-	-	-	-	-
French Polynesia	Polynesia	67.95	-	-	-	-	-	-
Cook Islands	Polynesia	-	-	-	-	-	-	-
Niue	Polynesia	-	-	-	-	-	-	-
Wallis and Futuna Islands	Polynesia	-	-	-	-	-	-	-
Tokelau	Polynesia	-	-	-	-	-	-	-
Pitcairn	Polynesia	-	-	-	-	-	-	-
Christmas Island	Australia and New Zealand	-	-	-	-	-	-	-
Cocos (Keeling) Islands	Australia and New Zealand	-	-	-	-	-	-	-
Heard and McDonald Islands	Australia and New Zealand	-	-	-	-	-	-	-
Norfolk Island	Australia and New Zealand	-	-	-	-	-	-	-
United States Minor Outlying Islands	Micronesia	-	-	-	-	-	-	-

8.2 Green growth dimension and pillar scores by region

Table 13. Scores on pillars for efficient and sustainable resource use by region and rank

Country	Regional Rank	Efficient and sustainable resource use	Indicator categories			
			Efficient and sustainable energy	Efficient and sustainable water use	Sustainable land use	Material use efficiency
AFRICA						
Gabon	1	73.50	56.16	68.88	98.70	76.44
Botswana	17	72.00	59.35	62.68	91.17	79.26
Sao Tome and Principe	-	70.27	60.62	51.17	98.94	79.43
Cote d'Ivoire	7	69.91	73.69	58.07	67.76	82.38
Comoros	-	68.74	59.15	67.93	68.29	81.37
Eritrea	-	67.92	55.60	51.00	98.85	75.94
South Sudan	-	67.88	64.11	52.04	96.45	65.98
Angola	36	66.43	63.01	56.88	66.56	81.64
Rwanda	26	65.96	71.84	52.93	66.40	74.98
Sierra Leone	31	65.59	57.61	59.09	80.38	67.63
Congo Republic	-	65.23	59.05	45.68	100.00	67.12
Uganda	16	65.08	51.66	58.12	76.36	78.27
Central African Republic	34	64.80	51.36	53.71	97.33	65.69
Chad	-	63.60	64.03	51.96	97.38	50.49
Burkina Faso	9	63.51	63.61	53.16	68.36	70.38
Mauritania	32	62.66	46.20	51.19	96.28	67.71
DR Congo	-	62.55	58.53	60.53	67.90	63.63
Tanzania	12	62.35	65.30	52.09	68.75	64.62
Equatorial Guinea	-	62.25	31.31	51.29	99.91	93.56
Malawi	21	62.13	68.97	51.44	58.01	72.38
Benin	15	61.86	66.53	39.95	70.12	78.57
Mauritius	2	61.76	45.22	53.64	64.37	93.20
Mali	25	60.74	60.87	50.77	66.91	65.81
Burundi	23	60.19	52.68	51.67	66.09	72.98
Cameroon	13	60.01	66.21	37.88	66.78	77.44
Gambia	8	59.95	65.00	53.61	65.78	56.34
Niger	39	59.69	58.24	50.92	66.85	64.02
Ethiopia	24	59.29	57.71	44.23	66.31	73.01
Zambia	10	59.27	56.85	53.08	62.39	65.54
Togo	4	59.20	54.12	37.93	78.00	76.71
Nigeria	33	59.05	59.91	38.72	66.83	78.41
Ghana	28	58.51	61.20	39.26	68.44	71.27
Djibouti	-	58.38	55.85	52.14	53.79	74.15
Madagascar	37	58.30	51.70	46.97	67.61	70.35
Somalia	-	58.13	56.43	50.55	65.45	61.16
Guinea-Bissau	-	57.87	56.98	41.43	66.98	70.93
Kenya	22	57.66	67.31	30.75	66.52	80.31

Table 13. Scores on pillars for efficient and sustainable resource use by region and rank *(continued)*

Country	Regional Rank	Efficient and sustainable resource use	Indicator categories			
			Efficient and sustainable energy	Efficient and sustainable water use	Sustainable land use	Material use efficiency
Namibia	6	57.09	55.95	43.26	66.62	65.89
Senegal	19	56.22	53.82	36.58	65.98	76.94
Mozambique	27	54.63	48.63	36.97	65.98	75.06
Liberia	-	53.85	38.78	51.18	66.44	63.80
Guinea	11	52.22	59.80	39.31	65.93	47.97
Seychelles	3	50.50	45.49	20.76	93.06	74.01
Lesotho	18	49.54	36.51	58.29	66.18	42.76
Zimbabwe	20	48.35	35.85	30.19	66.71	75.68
Cabo Verde	5	46.79	67.08	15.36	62.64	74.25
Morocco	29	45.88	42.23	19.88	66.98	78.82
South Africa	14	36.98	42.23	8.57	63.95	80.80
Tunisia	30	29.17	41.38	3.07	73.57	77.47
Eswatini	-	29.00	89.52	1.61	67.39	72.92
Sudan	40	27.28	62.96	1.82	65.87	73.43
Algeria	35	27.08	28.39	3.61	66.93	78.52
Libya	41	27.06	27.47	2.75	99.15	71.50
Egypt	38	22.51	42.42	1.88	50.05	64.29
THE AMERICAS						
Dominica	-	69.10	51.69	52.03	98.75	85.85
St. Vincent and the Grenadines	-	66.41	50.04	52.40	95.12	77.98
Paraguay	2	64.48	70.22	53.13	64.71	71.58
Uruguay	5	64.06	70.28	35.68	86.09	78.02
Grenada	-	63.92	53.93	54.35	70.04	81.33
Brazil	3	62.96	67.91	54.43	57.69	73.67
Puerto Rico	-	62.82	52.98	55.66	53.10	99.43
Bermuda	-	61.76	49.49	50.76	-	93.76
Cuba	-	61.32	49.26	52.73	66.19	82.25
Antigua and Barbuda	-	60.69	37.57	48.54	91.58	81.22
St. Lucia	-	60.33	51.35	-	62.24	68.72
Dominican Republic	18	60.06	48.53	37.70	86.78	81.96
Panama	7	59.08	65.27	41.00	59.83	76.09
Guatemala	21	58.65	63.81	36.43	66.41	76.65
Honduras	22	57.31	62.80	35.67	63.95	75.31
Peru	20	56.42	58.52	35.43	67.97	71.91
Nicaragua	16	56.31	64.71	35.97	63.73	67.76
Colombia	15	56.10	60.57	35.36	54.85	84.31
Bahamas	-	55.81	36.44	-	58.68	81.28
Belize	24	55.70	62.46	37.11	57.97	71.62
Argentina	17	55.45	44.30	36.17	72.89	80.93
El Salvador	11	55.19	49.39	37.00	62.84	80.78
Costa Rica	6	55.17	62.64	36.13	52.45	78.08
Haiti	-	55.08	57.04	35.66	65.53	69.04
United States	1	54.87	54.08	37.58	52.32	85.20

Table 13. Scores on pillars for efficient and sustainable resource use by region and rank *(continued)*

Country	Regional Rank	Efficient and sustainable resource use	Indicator categories			
			Efficient and sustainable energy	Efficient and sustainable water use	Sustainable land use	Material use efficiency
St. Kitts and Nevis	-	54.40	46.21	25.83	96.96	75.72
Ecuador	19	53.95	50.76	35.80	59.85	77.91
Venezuela	13	53.83	41.07	51.13	59.31	67.39
Canada	8	53.57	55.14	39.81	68.60	54.71
Guyana	23	53.21	42.57	35.86	65.11	80.66
Jamaica	9	52.87	40.03	37.76	64.46	80.16
Bolivia	12	52.80	39.67	52.87	51.50	71.92
Suriname	14	51.64	50.98	39.77	56.61	61.95
Chile	4	51.40	58.36	35.25	59.78	56.75
Mexico	10	48.08	49.43	22.49	63.07	76.21
Barbados	26	35.89	44.91	6.52	66.70	84.97
Trinidad and Tobago	25	31.16	6.33	40.84	47.98	76.00
Aruba	-	-	51.26	-	-	92.72
Cayman Islands	-	-	47.16	-	-	96.95
Turks and Caicos Islands	-	-	33.40	-	-	95.87
British Virgin Islands	-	-	-	-	-	99.16
Curacao	-	-	19.32	-	-	-
Guadeloupe	-	-	-	-	62.00	-
Martinique	-	-	-	-	63.76	-
Sint Maarten	-	-	26.41	-	-	-
Greenland	-	-	-	-	-	94.00
French Guiana	-	-	-	-	89.87	-
ASIA						
Timor-Leste	30	62.74	56.97	47.45	88.53	64.75
Laos	2	61.78	67.29	50.78	65.39	65.19
Japan	1	61.70	56.65	49.93	60.09	85.25
Nepal	19	60.99	61.96	50.89	59.89	73.28
North Korea	-	59.69	44.93	47.97	98.66	-
Myanmar	26	58.41	63.15	40.31	62.20	73.50
Philippines	8	58.33	58.01	34.72	70.01	82.09
Cyprus	10	58.23	53.51	38.80	74.31	74.54
Bhutan	6	56.91	48.43	51.38	67.24	62.68
Cambodia	23	56.28	64.28	36.92	64.78	65.27
Thailand	5	54.80	53.68	35.82	64.08	73.17
Vietnam	9	54.60	56.99	36.95	55.49	76.08
Indonesia	11	54.39	55.01	34.69	62.31	73.60
China	4	53.60	48.89	39.86	53.59	79.06
Georgia	3	52.75	48.62	35.20	58.24	77.70
Bangladesh	29	52.51	54.61	35.88	47.71	81.34
Malaysia	7	52.39	44.13	42.71	65.06	61.45
Maldives	12	52.10	38.12	63.28	-	58.64
Kazakhstan	18	51.35	33.01	42.87	67.13	73.21
Kyrgyz Republic	15	48.83	48.21	25.76	62.58	73.16

Table 13. Scores on pillars for efficient and sustainable resource use by region and rank *(continued)*

Country	Regional Rank	Efficient and sustainable resource use	Indicator categories			
			Efficient and sustainable energy	Efficient and sustainable water use	Sustainable land use	Material use efficiency
Israel	16	48.14	49.29	24.96	57.60	75.78
Palestine	32	47.27	57.66	33.19	55.18	-
Qatar	25	46.61	35.57	35.29	82.98	45.32
Brunei Darussalam	21	45.39	29.39	51.93	36.93	75.36
Afghanistan	37	44.65	42.17	21.04	66.92	66.94
Lebanon	35	44.40	40.53	20.18	63.96	74.27
Mongolia	27	44.34	26.21	54.67	51.23	52.66
Azerbaijan	17	42.63	31.27	19.14	66.01	83.61
Armenia	13	40.08	39.97	16.54	54.10	72.10
India	31	39.21	61.94	7.60	59.53	84.32
South Korea	14	37.12	43.89	11.44	46.09	81.99
United Arab Emirates	20	36.72	45.53	15.75	49.23	51.52
Tajikistan	24	36.04	53.34	6.10	63.39	81.82
Sri Lanka	28	35.11	70.72	3.45	73.52	84.82
Jordan	33	34.64	43.61	7.10	61.91	75.09
Bahrain	43	33.91	24.87	10.62	84.65	59.14
Iraq	41	33.88	27.65	11.70	66.11	61.62
Oman	34	32.48	32.60	8.52	61.03	65.65
Yemen	44	31.25	37.20	5.46	99.86	47.02
Saudi Arabia	36	29.93	33.95	5.45	62.02	69.94
Singapore	22	28.85	53.14	-	7.29	61.92
Kuwait	39	28.42	27.67	12.93	31.46	57.99
Pakistan	42	24.42	58.04	1.54	52.74	75.40
Iran	38	22.10	24.34	2.10	60.92	76.57
Uzbekistan	40	19.36	25.69	1.36	47.49	84.69
Turkmenistan	-	18.26	16.96	1.27	65.65	78.82
Syria	-	12.85	7.71	1.06	67.30	49.78
Hong Kong	-	-	55.11	-	35.23	-
Macau	-	-	63.61	-	-	-
EUROPE						
Switzerland	1	82.02	71.55	100.00	80.91	78.17
Austria	3	79.64	75.03	71.65	92.49	80.88
Sweden	6	79.49	83.70	63.73	93.16	80.35
Denmark	2	78.42	79.09	66.32	89.49	80.58
Czech Republic	5	77.42	56.09	76.39	90.51	92.62
Slovakia	7	76.05	49.57	78.91	93.25	91.71
Luxembourg	22	73.96	62.93	100.00	70.63	67.32
Latvia	21	71.95	66.48	52.06	96.49	80.25
Finland	8	70.22	78.05	41.76	96.19	77.53
Lithuania	18	69.83	62.19	55.58	85.95	80.05
United Kingdom	9	68.45	60.88	67.07	61.17	87.88
France	13	67.60	59.51	45.34	88.31	87.64
Germany	4	67.16	65.50	42.47	87.55	83.55

Table 13. Scores on pillars for efficient and sustainable resource use by region and rank *(continued)*

Country	Regional Rank	Efficient and sustainable resource use	Indicator categories			
			Efficient and sustainable energy	Efficient and sustainable water use	Sustainable land use	Material use efficiency
Hungary	12	66.93	53.71	55.31	77.94	86.70
Bosnia and Herzegovina	29	66.00	55.03	-	63.76	81.95
Estonia	15	65.28	66.52	37.29	94.89	77.18
Croatia	20	65.21	63.74	40.07	78.99	89.65
Italy	11	65.03	60.93	36.94	91.70	86.66
Albania	23	64.93	65.52	52.83	59.51	86.31
Portugal	19	64.28	69.61	38.17	80.50	79.83
Romania	27	63.90	68.16	36.97	77.90	84.91
Norway	17	63.89	80.00	53.11	61.31	63.96
Greece	32	62.87	57.21	36.22	89.55	84.21
Slovenia	16	62.06	58.31	39.94	83.22	76.56
Serbia	31	61.77	51.54	51.77	68.39	79.76
Ireland	36	61.42	58.76	66.85	46.11	78.57
Spain	24	60.69	62.47	26.79	90.27	89.78
Belarus	10	60.66	33.58	56.72	86.42	82.24
Moldova	34	59.83	43.81	52.14	70.40	79.66
Netherlands	14	59.58	59.48	45.46	58.10	80.24
Poland	25	59.31	55.09	35.72	73.45	85.63
Iceland	37	59.07	53.54	52.26	55.26	78.73
Macedonia	30	56.83	49.25	38.59	66.19	82.91
Ukraine	35	55.86	35.05	51.84	68.72	78.00
Russia	33	54.19	27.07	54.09	67.13	87.77
Bulgaria	28	52.62	49.85	26.90	67.77	84.38
Belgium	26	51.34	57.16	28.59	56.27	75.57
Malta	38	45.62	48.35	27.71	44.45	72.74
Montenegro	39	30.77	61.96	4.86	38.17	78.01
Andorra	-	-	65.00	-	-	76.43
Faeroe Islands	-	-	-	-	34.69	-
Kosovo	-	-	56.71	-	-	-
Liechtenstein	-	-	-	-	-	99.99
Monaco	-	-	-	-	-	100.00
San Marino	-	-	-	-	-	99.97
OCEANIA						
Samoa	-	84.46	71.07	-	99.32	85.36
Solomon Islands	-	77.02	62.48	-	84.46	86.59
Kiribati	-	76.79	70.09	-	79.92	80.83
Tuvalu	-	73.11	48.91	-	91.11	87.71
Vanuatu	-	68.79	59.21	-	70.19	78.31
Papua New Guinea	4	68.26	56.12	-	70.70	80.15
French Polynesia	-	67.95	51.90	-	69.04	87.57
Australia	3	65.27	53.89	64.90	92.99	55.82
Nauru	-	63.67	30.69	-	98.65	85.27
Tonga	-	63.16	39.06	-	73.55	87.69

Table 13. Scores on pillars for efficient and sustainable resource use by region and rank *(continued)*

Country	Regional Rank	Efficient and sustainable resource use	Indicator categories			
			Efficient and sustainable energy	Efficient and sustainable water use	Sustainable land use	Material use efficiency
Fiji	2	61.95	54.36	39.79	83.55	81.51
Micronesia, Fed. Sts.	-	61.25	32.83	-	96.48	72.53
New Zealand	1	60.39	66.64	40.72	66.56	73.66
New Caledonia	-	40.90	17.63	-	58.77	66.02
Marshall Islands	-	-	28.54	-	-	91.07
Palau	-	-	7.13	-	-	93.68
Cook Islands	-	-	-	-	61.64	-
Niue	-	-	-	-	73.70	-

Table 14. Scores on pillars for natural capital protection by region and rank

Country	Regional Rank	Natural Capital Protection	Indicator categories			
			Environmental Quality	GHG Emissions Reductions	Biodiversity and Ecosystem Protection	Cultural and Social Value
AFRICA						
Seychelles	3	78.77	83.00	77.45	71.59	83.66
Zimbabwe	20	74.70	67.98	78.90	69.32	83.75
Gabon	1	74.58	76.65	81.15	75.64	65.75
Malawi	21	73.93	66.60	91.64	57.62	84.94
Congo Republic	-	73.25	69.15	84.82	72.50	67.70
Sao Tome and Principe	-	71.60	82.77	95.58	74.97	44.30
Uganda	16	71.27	67.01	89.48	53.43	80.55
Zambia	10	70.02	68.70	69.35	55.90	90.25
DR Congo	-	69.78	70.37	82.08	67.40	60.90
Rwanda	26	69.31	63.98	96.63	49.80	74.97
Burkina Faso	9	68.94	43.95	86.09	60.37	98.88
Togo	4	68.47	51.43	93.22	69.88	65.62
Ethiopia	24	68.40	63.26	86.94	45.26	87.97
Burundi	23	67.33	53.86	96.31	56.19	70.51
Mozambique	27	67.05	70.41	81.51	58.12	60.57
Guinea	11	67.04	57.30	79.41	69.11	64.24
Guinea-Bissau	-	66.27	54.85	86.18	58.64	69.58
Cote d'Ivoire	7	66.13	56.51	93.91	51.33	70.19
Morocco	29	66.09	82.19	90.59	48.72	52.59
Tanzania	12	65.84	67.58	83.04	56.94	58.83
Ghana	28	65.08	65.07	90.37	64.24	47.49
Senegal	19	64.88	61.90	87.56	46.15	70.85
South Africa	14	63.87	69.13	77.26	47.93	65.04
Benin	15	63.66	56.40	91.13	49.31	64.83
Gambia	8	63.57	59.42	91.75	57.13	52.44
Namibia	6	63.38	66.33	60.20	50.78	79.61
Botswana	17	63.23	70.49	40.33	57.30	98.13
South Sudan	-	62.47	48.89	59.22	55.72	94.39
Kenya	22	61.96	72.44	88.88	41.27	55.48
Mali	25	61.83	45.87	82.33	50.65	76.39
Cabo Verde	5	61.75	70.49	95.73	34.67	62.15
Cameroon	13	60.97	52.03	70.91	65.63	57.06
Tunisia	30	60.73	84.30	88.70	27.98	65.02
Comoros	-	60.72	81.08	95.72	59.38	29.49
Sierra Leone	31	59.92	50.00	92.54	61.54	45.28
Equatorial Guinea	-	59.30	74.13	58.71	83.51	34.02
Eswatini	-	58.87	62.62	83.00	44.84	51.53
Angola	36	58.48	68.60	80.14	48.65	43.73
Nigeria	33	58.47	35.54	91.40	63.06	57.08
Madagascar	37	58.07	59.88	90.19	57.10	36.86
Liberia	-	56.07	49.71	82.48	62.19	38.77
Egypt	38	55.84	66.69	90.29	22.48	71.82

Table 14. Scores on pillars for natural capital protection by region and rank *(continued)*

Country	Regional Rank	Natural Capital Protection	Indicator categories			
			Environmental Quality	GHG Emissions Reductions	Biodiversity and Ecosystem Protection	Cultural and Social Value
Central African Republic	34	55.54	44.79	29.86	74.82	95.06
Mauritius	2	53.37	88.98	77.72	47.26	24.82
Chad	-	53.33	42.09	60.37	34.16	93.21
Algeria	35	51.58	81.72	80.76	23.39	45.85
Niger	39	51.35	30.39	83.39	29.00	94.62
Sudan	40	50.97	73.14	79.07	29.64	39.39
Lesotho	18	49.82	58.24	85.43	25.94	47.73
Somalia	-	48.29	53.98	83.10	27.16	44.63
Eritrea	-	46.85	51.35	81.77	23.46	48.89
Djibouti	-	38.87	69.08	91.04	8.34	43.54
Mauritania	32	36.60	58.06	76.96	9.66	41.55
Libya	41	29.01	78.10	51.62	5.03	34.92
British Indian Ocean Territory	-	-	-	-	-	56.75
Mayotte	-	-	-	-	-	64.36
St. Helena	-	-	-	-	-	39.57
Western Sahara	-	-	-	-	-	62.47
Reunion	-	-	-	-	50.85	-
THE AMERICAS						
Panama	7	75.60	87.82	78.17	64.88	73.33
Dominican Republic	18	75.06	83.72	85.12	68.01	65.47
Chile	4	74.34	84.91	87.22	63.23	65.20
Mexico	10	73.57	84.48	79.81	53.10	81.85
Honduras	22	72.74	84.09	86.22	66.23	58.31
St. Vincent and the Grenadines	-	72.65	86.57	90.24	66.88	53.30
St. Lucia	-	72.52	83.14	80.69	71.46	57.68
Costa Rica	6	72.26	88.73	86.34	63.67	55.90
Belize	24	72.15	86.35	54.57	64.83	88.71
Bolivia	12	71.97	85.20	58.61	60.71	88.50
Colombia	15	71.79	87.56	75.86	67.16	59.52
Peru	20	71.45	83.22	82.18	63.73	59.81
Brazil	3	71.38	89.46	65.68	63.49	69.58
Venezuela	13	70.75	84.63	62.76	75.47	62.50
Ecuador	19	70.63	87.16	80.97	61.84	57.03
Nicaragua	16	69.77	86.93	74.24	62.40	58.83
Jamaica	9	67.83	87.63	92.23	56.92	46.01
Bahamas	-	67.66	80.62	82.26	43.66	72.40
Dominica	-	67.40	90.35	88.05	58.75	44.15
St. Kitts and Nevis	-	67.25	83.67	72.30	68.07	49.68
Guatemala	21	66.55	79.20	88.88	56.72	49.12
Cuba	-	66.53	89.81	82.94	66.92	39.31
Paraguay	2	66.50	91.48	40.39	55.00	96.20
El Salvador	11	64.50	86.33	90.28	58.81	37.76
Suriname	14	64.42	87.87	42.40	79.24	58.36

Table 14. Scores on pillars for natural capital protection by region and rank *(continued)*

Country	Regional Rank	Natural Capital Protection	Indicator categories			
			Environmental Quality	GHG Emissions Reductions	Biodiversity and Ecosystem Protection	Cultural and Social Value
Antigua and Barbuda	-	63.88	88.06	56.61	55.59	60.09
United States	1	63.07	80.63	51.30	52.44	72.95
Guyana	23	62.20	85.93	35.53	100.00	49.04
Grenada	-	61.54	86.77	61.28	56.44	47.78
Uruguay	5	60.79	90.99	56.94	42.82	61.57
Argentina	17	60.33	88.23	53.11	48.15	58.72
Canada	8	59.46	83.14	37.96	51.65	76.69
Bermuda	-	59.10	69.09	-	64.35	46.44
Barbados	26	58.98	79.21	58.98	44.80	57.82
Trinidad and Tobago	25	54.16	80.68	54.07	48.00	41.08
Haiti	-	52.64	58.67	94.45	46.90	29.53
United States Virgin Islands	-	51.53	66.31	-	51.84	39.80
Puerto Rico	-	50.23	70.43	-	53.77	33.47
Greenland	-	45.51	79.04	-	15.77	75.65
Anguilla	-	-	-	-	32.15	92.10
Aruba	-	-	-	-	22.91	66.06
British Virgin Islands	-	-	-	-	52.38	55.11
Cayman Islands	-	-	-	-	77.52	56.60
Curacao	-	-	-	-	22.17	62.04
Falkland Islands	-	-	-	-	10.68	52.97
French Guiana	-	-	-	-	82.26	60.87
Saint-Martin	-	-	-	-	68.08	95.48
Sint Maarten	-	-	-	-	35.53	86.15
St. Pierre and Miquelon	-	-	-	-	4.84	63.65
Turks and Caicos Islands	-	-	-	-	41.83	60.37
Guadeloupe	-	-	-	-	85.18	-
Martinique	-	-	-	-	85.00	-
St. Barths	-	-	-	-	46.91	-
Montserrat	-	-	-	-	-	69.37
ASIA						
Bhutan	6	79.85	78.71	87.08	68.90	86.08
Cambodia	23	78.06	89.13	78.18	59.50	89.55
Laos	2	76.47	86.04	78.95	58.30	86.36
Philippines	8	75.09	88.60	90.86	66.49	59.39
Cyprus	10	74.00	82.13	81.84	57.97	76.94
Japan	1	73.71	90.21	81.96	64.38	62.00
Georgia	3	73.67	91.18	77.76	56.40	73.66
Nepal	19	73.56	59.62	87.20	63.97	88.02
Thailand	5	73.40	79.53	73.17	64.28	77.62
Armenia	13	69.80	85.20	83.67	38.01	87.60
Malaysia	7	67.52	85.18	66.64	61.49	59.54
Azerbaijan	17	65.00	84.44	54.30	58.88	66.12
Timor-Leste	30	64.81	88.01	61.37	58.30	56.04

Table 14. Scores on pillars for natural capital protection by region and rank *(continued)*

Country	Regional Rank	Natural Capital Protection	Indicator categories			
			Environmental Quality	GHG Emissions Reductions	Biodiversity and Ecosystem Protection	Cultural and Social Value
Indonesia	11	64.50	82.40	78.89	57.52	46.29
Sri Lanka	28	64.07	90.89	93.03	53.95	36.93
China	4	63.61	76.15	75.22	42.17	67.79
Vietnam	9	62.59	91.54	82.93	51.16	39.52
Kyrgyz Republic	15	61.93	88.47	88.61	28.27	66.35
Myanmar	26	60.62	83.18	78.44	52.38	39.51
Tajikistan	24	60.24	71.34	90.91	20.49	99.13
Turkey	-	59.55	82.05	83.23	-	30.92
Singapore	22	59.39	88.22	58.24	48.47	49.95
Lebanon	35	58.85	81.73	83.90	35.30	49.55
Iran	38	57.94	81.69	68.63	40.20	50.00
South Korea	14	57.85	82.63	68.67	55.14	35.81
Uzbekistan	40	57.37	85.43	62.46	29.28	69.34
North Korea	-	56.45	75.52	88.80	38.80	39.04
Brunei Darussalam	21	56.23	87.78	31.19	66.76	54.70
Mongolia	27	55.07	63.82	39.62	37.74	96.42
Afghanistan	37	54.98	62.61	79.54	31.65	57.95
Bangladesh	29	54.84	66.44	92.80	40.60	36.13
India	31	54.35	51.04	91.40	41.67	44.89
Kazakhstan	18	53.86	88.54	55.56	20.23	84.55
Pakistan	42	52.51	60.74	89.49	26.02	53.76
Maldives	12	52.16	85.15	88.42	16.70	58.86
Israel	16	48.69	80.20	65.73	21.04	50.66
Jordan	33	48.45	83.06	88.94	12.24	60.92
United Arab Emirates	20	47.88	70.88	31.73	29.92	78.13
Turkmenistan	-	45.75	89.69	35.20	22.99	60.35
Oman	34	41.20	67.91	57.51	16.27	45.32
Syria	-	41.19	84.92	90.60	10.37	36.08
Kuwait	39	40.66	62.92	32.75	22.74	58.32
Yemen	44	40.15	75.40	96.47	12.19	29.30
Qatar	25	39.98	58.76	36.32	20.80	57.59
Iraq	41	37.56	72.96	88.54	10.01	30.78
Saudi Arabia	36	36.89	64.10	46.87	11.79	52.28
Palestine	32	32.83	81.75	-	5.90	73.36
Bahrain	43	23.11	61.59	33.65	3.65	37.65
Hong Kong	-	-	-	-	-	91.25
Taiwan	-	-	88.24	-	-	-
EUROPE						
Liechtenstein	-	87.41	-	85.43	79.32	98.53
Slovakia	7	84.66	86.16	80.32	76.12	97.52
Croatia	20	83.78	85.46	81.10	75.50	94.16
Albania	23	83.45	86.82	82.60	81.79	82.70
Germany	4	82.97	84.66	77.61	74.69	96.56

Table 14. Scores on pillars for natural capital protection by region and rank *(continued)*

Country	Regional Rank	Natural Capital Protection	Indicator categories			
			Environmental Quality	GHG Emissions Reductions	Biodiversity and Ecosystem Protection	Cultural and Social Value
Czech Republic	5	81.96	84.74	70.09	77.90	97.53
Hungary	12	81.84	87.57	78.41	70.16	93.15
Bulgaria	28	80.54	85.89	83.83	80.65	72.47
Austria	3	80.41	85.00	78.14	69.77	90.23
Italy	11	80.38	85.34	81.15	68.55	87.91
Switzerland	1	80.12	83.09	84.72	63.41	92.32
Portugal	19	79.51	87.74	78.87	61.62	93.71
France	13	79.14	86.25	79.21	71.53	80.28
United Kingdom	9	79.00	88.93	79.37	63.55	86.85
Belarus	10	78.82	86.25	60.51	75.39	98.09
Slovenia	16	78.81	84.79	76.58	78.23	75.95
Latvia	21	78.52	88.56	73.35	75.86	77.12
Sweden	6	78.43	89.25	87.50	60.77	79.71
Romania	27	78.06	90.46	79.75	75.23	68.40
Greece	32	77.84	85.60	75.38	65.43	86.97
Luxembourg	22	77.64	81.10	66.87	68.02	98.49
Andorra	-	77.51	87.57	78.36	54.50	96.51
Estonia	15	77.51	91.12	66.69	74.32	79.92
Belgium	26	77.04	88.85	75.58	70.57	74.33
Spain	24	76.70	88.63	80.03	59.18	82.43
Poland	25	75.99	86.10	70.06	76.65	72.11
Macedonia	30	75.18	83.48	78.63	55.97	86.96
Norway	17	74.92	81.47	76.38	59.10	85.68
Lithuania	18	74.57	88.44	65.73	74.06	71.84
Malta	38	74.23	82.10	87.02	52.14	81.53
Moldova	34	74.00	71.37	78.77	59.15	90.17
Denmark	2	73.71	79.83	70.77	70.29	74.35
Netherlands	14	73.47	86.94	72.30	55.32	83.81
Ukraine	35	72.78	89.76	75.78	65.13	63.33
Finland	8	72.35	86.51	67.87	63.81	73.12
Serbia	31	69.44	84.94	66.52	56.89	72.35
Montenegro	39	67.75	82.28	74.68	52.60	65.16
Bosnia and Herzegovina	29	65.51	82.70	76.86	64.12	45.20
Russia	33	58.36	89.19	47.45	49.29	55.62
Ireland	36	58.04	85.74	49.54	59.03	45.26
Iceland	37	45.24	84.35	59.48	13.08	63.81
Monaco	-	18.09	70.22	-	1.00	84.30
San Marino	-	-	87.68	-	60.04	-
Faeroe Islands	-	-	-	-	9.20	40.72
Gibraltar	-	-	-	-	1.00	60.51
Isle of Man	-	-	-	-	28.28	97.15
Jersey	-	-	-	-	-	67.86
Guernsey	-	-	-	-	-	66.78

Table 14. Scores on pillars for natural capital protection by region and rank *(continued)*

Country	Regional Rank	Natural Capital Protection	Indicator categories			
			Environmental Quality	GHG Emissions Reductions	Biodiversity and Ecosystem Protection	Cultural and Social Value
Svalbard and Jan Mayen Islands	-	-	-	-	42.00	-
OCEANIA						
Palau	-	78.49	84.61	71.58	85.89	72.95
American Samoa	-	77.13	88.21	-	71.05	73.23
Tuvalu	-	72.92	87.36	89.64	-	49.51
Northern Mariana Islands	-	72.34	82.70	-	67.65	67.67
New Zealand	1	68.99	82.61	48.60	69.18	81.56
Fiji	2	68.18	88.84	86.57	52.36	53.67
Samoa	-	67.96	94.59	81.94	57.14	48.17
Vanuatu	-	64.79	85.99	78.19	52.14	50.27
Marshall Islands	-	64.12	91.87	86.01	47.13	45.38
Tonga	-	63.23	93.69	85.19	45.07	44.44
Micronesia, Fed. Sts.	-	60.72	90.41	91.69	67.18	24.41
Kiribati	-	60.21	77.56	97.77	23.29	74.42
Papua New Guinea	4	52.96	71.59	79.55	49.37	27.98
Australia	3	52.66	86.61	19.45	59.36	76.92
Solomon Islands	-	52.29	85.36	60.21	42.31	34.39
Nauru	-	24.50	84.88	95.04	1.00	44.69
Guam	-	15.53	76.89	-	43.59	1.12
French Polynesia	-	-	-	-	45.47	45.88
New Caledonia	-	-	-	-	59.78	78.69
Niue	-	-	-	-	61.10	74.12
Tokelau	-	-	-	-	1.00	76.62
Wallis and Futuna Islands	-	-	-	-	23.24	76.82
Christmas Island	-	-	-	-	-	51.56
Cocos (Keeling) Islands	-	-	-	-	-	75.94
Cook Islands	-	-	-	-	-	74.98
Norfolk Island	-	-	-	-	-	69.32
Pitcairn	-	-	-	-	-	67.34

Table 15. Scores on pillars for green economic opportunities by region and rank

Country	Regional Rank	Green Economic Opportunities	Indicator categories			
			Green Investment	Green Trade	Green Employment	Green Innovation
AFRICA						
Burkina Faso	9	50.44	41.79	66.64	-	46.09
Lesotho	18	47.04	34.32	65.50	-	46.32
Mauritania	32	47.04	48.00	51.04	-	42.48
Togo	4	46.68	38.66	67.06	-	39.23
Guinea	11	45.97	23.32	66.16	-	62.98
Mauritius	2	45.86	46.39	66.29	55.12	26.10
Cabo Verde	5	45.17	54.69	-	61.50	27.41
South Africa	14	42.96	40.02	73.06	40.32	28.90
Zambia	10	42.95	46.41	67.42	21.71	50.12
Benin	15	42.40	41.48	66.51	-	27.64
Gabon	1	41.46	52.20	52.38	49.78	21.71
Gambia	8	41.39	36.39	50.64	-	38.47
Cote d'Ivoire	7	39.25	58.40	48.52	-	21.34
Namibia	6	37.09	42.13	59.80	-	20.25
Cameroon	13	35.80	32.01	67.03	45.89	16.68
Egypt	38	35.65	41.76	71.80	45.10	11.94
Tanzania	12	35.61	66.30	48.16	15.72	32.04
Burundi	23	35.35	24.09	52.29	27.61	44.92
Tunisia	30	35.04	56.81	75.12	27.26	12.96
Mozambique	27	34.83	33.91	61.29	-	20.33
Zimbabwe	20	34.34	40.95	66.86	23.02	22.06
Seychelles	3	33.97	31.04	51.12	-	24.70
Central African Republic	34	33.50	14.12	52.61	-	50.61
Ethiopia	24	32.53	38.08	65.85	16.13	27.69
Sudan	40	32.47	25.65	50.57	-	26.39
Sierra Leone	31	31.98	24.44	56.70	-	23.60
Algeria	35	31.76	51.27	51.91	39.35	9.71
Mali	25	30.89	35.18	50.99	-	16.43
Senegal	19	30.62	42.55	65.62	10.84	29.03
Uganda	16	30.32	34.19	65.51	18.86	20.01
Kenya	22	30.26	37.56	66.97	13.61	24.51
Malawi	21	28.34	25.02	64.56	-	14.10
Libya	41	25.38	27.38	52.37	-	11.40
Ghana	28	23.56	42.34	66.51	4.90	22.34
Morocco	29	23.35	56.46	69.03	4.85	15.74
Botswana	17	22.54	47.55	61.98	4.89	17.88
Madagascar	37	22.42	23.59	64.94	5.39	30.61
Nigeria	33	22.29	42.06	67.10	10.69	8.18
Rwanda	26	21.41	40.58	67.30	1.56	49.28
Angola	36	20.82	43.98	50.79	6.81	12.35
Niger	39	19.40	33.34	50.94	17.67	4.72
Eswatini	-	-	39.95	-	-	18.86
DR Congo	-	-	33.24	-	-	15.43

Table 15. Scores on pillars for green economic opportunities by region and rank *(continued)*

Country	Regional Rank	Green Economic Opportunities	Indicator categories			
			Green Investment	Green Trade	Green Employment	Green Innovation
Comoros	-	-	22.31	50.74	-	-
Congo Republic	-	-	23.38	-	-	21.27
Djibouti	-	-	37.14	-	-	12.94
Guinea-Bissau	-	-	31.26	50.50	-	-
Sao Tome and Principe	-	-	15.57	-	-	50.90
Eritrea	-	-	-	53.42	-	50.73
Chad	-	-	-	-	-	40.80
Liberia	-	-	-	-	-	22.94
Reunion	-	-	-	-	-	20.59
Somalia	-	-	-	-	-	50.55
Equatorial Guinea	-	-	-	-	-	53.13
South Sudan	-	-	32.54	-	-	-
THE AMERICAS						
United States	1	54.69	65.14	64.97	39.86	53.04
Trinidad and Tobago	25	50.76	63.88	100.00	-	20.48
Paraguay	2	50.12	36.86	65.45	47.35	55.23
Suriname	14	47.61	41.03	52.16	-	50.42
Jamaica	9	47.53	47.51	70.38	69.02	22.11
El Salvador	11	45.15	35.15	70.17	49.34	34.16
Canada	8	45.07	52.78	50.49	38.13	40.59
Mexico	10	44.98	42.92	76.04	51.27	24.46
Costa Rica	6	44.81	46.13	66.03	41.95	31.56
Chile	4	44.08	29.66	68.67	48.71	38.07
Brazil	3	43.49	34.52	69.72	42.79	34.72
Panama	7	42.56	42.78	65.72	37.88	30.79
Uruguay	5	41.89	32.10	64.60	38.31	38.78
Venezuela	13	41.83	-	52.05	48.13	29.21
Guatemala	21	40.47	32.75	69.50	47.09	25.02
Argentina	17	39.76	41.50	62.78	43.44	22.09
Colombia	15	39.73	33.73	68.04	47.64	22.79
Nicaragua	16	39.03	37.46	66.11	49.70	18.85
Bolivia	12	38.24	49.05	51.84	50.51	16.66
Honduras	22	37.14	39.08	67.92	-	19.30
Ecuador	19	36.99	27.78	66.93	49.62	20.29
Peru	20	36.38	34.04	67.30	41.42	18.47
Barbados	26	36.01	30.48	60.71	-	25.23
Dominican Republic	18	35.39	39.80	68.73	41.27	13.89
Guyana	23	33.39	34.10	51.27	-	21.29
Belize	24	28.68	31.14	50.84	-	14.90
Antigua and Barbuda	-	-	17.00	-	-	12.08
Bahamas	-	-	33.72	-	-	31.59
Grenada	-	-	26.59	-	-	34.53
Haiti	-	-	45.57	-	-	15.47
Dominica	-	-	48.32	-	-	53.82

Table 15. Scores on pillars for green economic opportunities by region and rank *(continued)*

Country	Regional Rank	Green Economic Opportunities	Indicator categories			
			Green Investment	Green Trade	Green Employment	Green Innovation
Cuba	-	-	-	58.88	-	8.43
British Virgin Islands	-	-	-	-	-	38.53
French Guiana	-	-	-	-	-	70.86
Guadeloupe	-	-	-	-	-	67.51
Puerto Rico	-	-	-	-	-	29.54
St. Kitts and Nevis	-	-	-	-	-	29.33
St. Lucia	-	-	-	-	-	51.25
St. Vincent and the Grenadines	-	-	-	-	-	52.93
United States Virgin Islands	-	-	-	-	-	19.97
Aruba	-	-	-	-	-	62.59
ASIA						
South Korea	14	58.31	73.97	68.09	59.78	38.39
China	4	56.85	58.74	78.17	52.17	43.60
Laos	2	56.30	55.64	65.02	-	49.34
Qatar	25	55.98	61.41	67.00	67.56	35.34
Malaysia	7	54.26	62.24	75.82	48.18	38.14
United Arab Emirates	20	53.72	69.69	56.03	57.96	36.81
Maldives	12	52.21	50.97	-	53.09	52.60
Bhutan	6	52.04	46.57	52.47	-	57.65
Palestine	32	51.75	-	66.15	60.38	34.70
Singapore	22	50.25	99.77	62.91	29.42	34.52
Vietnam	9	50.23	66.14	72.44	46.23	28.73
Georgia	3	49.59	37.75	73.59	59.10	36.83
Armenia	13	48.41	40.72	67.70	72.26	27.57
Thailand	5	48.35	55.69	75.95	51.11	25.27
Azerbaijan	17	47.80	48.57	67.57	54.60	29.13
Oman	34	47.54	46.39	76.61	73.68	19.51
Japan	1	47.33	55.14	84.33	25.03	43.12
Indonesia	11	47.28	49.20	69.81	41.77	34.84
Israel	16	45.81	64.01	76.08	17.50	51.68
Kuwait	39	45.36	60.36	67.41	-	22.94
Tajikistan	24	45.17	44.29	65.00	34.17	42.30
Brunei Darussalam	21	43.37	61.08	69.75	-	19.14
Kazakhstan	18	41.53	41.40	62.37	41.65	27.66
Kyrgyz Republic	15	41.42	37.56	63.07	37.13	33.45
Saudi Arabia	36	40.82	44.79	69.15	-	21.97
Sri Lanka	28	40.00	44.07	65.65	37.04	23.90
Philippines	8	39.60	41.64	69.83	43.64	19.37
Bahrain	43	39.40	42.28	70.31	-	20.58
Jordan	33	36.73	44.71	68.82	22.40	26.39
India	31	35.11	42.39	44.47	29.46	27.38
Mongolia	27	35.07	32.17	67.11	35.27	19.86
Iran	38	34.54	-	57.20	40.74	17.68

Table 15. Scores on pillars for green economic opportunities by region and rank *(continued)*

Country	Regional Rank	Green Economic Opportunities	Indicator categories			
			Green Investment	Green Trade	Green Employment	Green Innovation
Cyprus	10	34.05	53.57	68.50	12.94	28.31
Myanmar	26	33.92	42.08	51.72	40.42	15.04
Afghanistan	37	33.47	14.20	52.00	-	50.81
Bangladesh	29	31.02	53.36	64.48	32.24	8.35
Iraq	41	29.18	30.36	50.49	79.83	5.93
Uzbekistan	40	28.59	41.74	51.36	10.91	-
Pakistan	42	27.17	41.75	68.79	11.20	16.93
Nepal	19	26.34	44.87	61.63	14.85	11.73
Cambodia	23	26.14	56.78	63.37	4.65	27.91
Yemen	44	25.54	7.20	50.51	52.87	22.15
Lebanon	35	23.52	12.22	54.02	23.19	19.98
Timor-Leste	30	16.41	7.28	51.75	-	11.73
Syria	-	-	53.55	-	-	8.80
Hong Kong	-	-	-	44.35	-	46.33
Turkmenistan	-	-	-	-	-	50.51
North Korea	-	-	-	-	-	10.06
Taiwan	-	-	-	-	-	42.06
EUROPE						
Denmark	2	61.16	72.77	77.27	52.37	47.50
Germany	4	59.81	69.67	80.37	46.20	49.47
Switzerland	1	57.01	66.99	59.07	51.35	51.99
Belarus	10	56.90	52.40	70.67	49.74	-
Finland	8	54.00	56.68	75.59	36.20	54.82
Austria	3	53.13	71.30	76.14	33.70	43.55
Netherlands	14	52.32	86.15	59.97	27.97	51.87
Czech Republic	5	52.25	68.37	74.28	46.09	31.83
Russia	33	51.38	71.13	53.74	59.43	30.67
United Kingdom	9	51.37	64.40	65.50	32.93	50.14
Slovakia	7	49.61	66.79	87.23	39.88	26.08
Sweden	6	48.98	68.52	75.50	22.10	50.35
Slovenia	16	48.79	75.82	73.61	34.33	29.57
Hungary	12	47.89	78.40	82.56	34.58	23.51
Belgium	26	47.29	58.74	66.93	25.67	49.57
Italy	11	46.98	64.92	76.91	32.33	30.17
Norway	17	46.75	57.02	69.23	26.93	44.95
Estonia	15	46.38	73.82	74.31	25.41	33.19
France	13	44.24	61.66	63.94	27.38	35.50
Lithuania	18	43.99	64.78	71.61	24.88	32.45
Poland	25	43.96	61.78	76.68	33.83	23.30
Bosnia and Herzegovina	29	42.96	45.34	62.92	44.92	26.59
Spain	24	42.91	50.59	75.40	31.86	27.89
Portugal	19	42.86	51.74	76.55	25.80	33.01
Bulgaria	28	42.48	55.11	78.17	29.82	25.34
Albania	23	41.91	33.20	66.05	39.72	35.42

Table 15. Scores on pillars for green economic opportunities by region and rank *(continued)*

Country	Regional Rank	Green Economic Opportunities	Indicator categories			
			Green Investment	Green Trade	Green Employment	Green Innovation
Macedonia	30	41.62	52.58	-	44.75	30.66
Croatia	20	41.36	61.24	74.28	29.44	21.85
Romania	27	40.22	52.60	80.77	27.58	22.33
Serbia	31	40.10	44.72	64.18	39.72	22.68
Ukraine	35	39.62	34.91	54.00	53.44	24.47
Latvia	21	39.30	45.78	66.03	28.31	27.87
Luxembourg	22	36.88	65.24	75.94	8.41	44.42
Iceland	37	36.67	51.14	51.73	17.34	39.41
Montenegro	39	34.92	19.77	54.67	39.25	35.06
Ireland	36	34.39	57.54	67.97	7.94	45.02
Moldova	34	32.50	47.94	-	44.68	16.03
Greece	32	30.46	46.42	72.12	20.23	12.72
Malta	38	28.41	43.45	40.73	11.67	31.54
Andorra	-	-	22.07	-	-	-
OCEANIA						
Fiji	2	54.06	51.80	78.31	-	38.95
New Zealand	1	40.80	45.45	68.91	21.03	42.09
Papua New Guinea	4	39.94	35.85	56.80	-	31.28
Australia	3	37.56	53.39	35.89	27.90	37.23
Solomon Islands	-	-	37.63	-	-	50.67
Samoa	-	-	59.42	-	-	29.54
Tonga	-	-	27.80	-	-	52.98
Vanuatu	-	-	42.11	-	-	51.74
Kiribati	-	-	-	-	-	34.28
Marshall Islands	-	-	-	-	-	15.87
New Caledonia	-	-	-	-	-	37.55
Tuvalu	-	-	-	-	-	12.68
Palau	-	-	18.69	-	-	-
Wallis and Futuna Islands	-	-	-	-	-	-

Table 16. Scores on pillars for social inclusion by region and rank

Country	Regional Rank	Social Inclusion	Indicator categories			
			Access to Basic Services and Resources	Gender Balance	Social Equity	Social Protection
AFRICA						
Mauritius	2	78.98	82.84	79.84	87.12	67.55
Seychelles	3	77.65	96.14	60.76	86.89	71.61
Algeria	35	73.83	73.56	56.08	90.24	79.81
Tunisia	30	73.01	77.73	51.66	85.86	82.38
Cabo Verde	5	71.48	83.34	63.56	81.29	60.64
South Africa	14	69.81	63.03	97.26	53.70	72.14
Namibia	6	67.50	60.93	87.07	56.91	68.75
Egypt	38	66.42	64.65	48.51	86.28	71.92
Libya	41	65.94	61.22	66.70	-	70.19
Morocco	29	64.70	71.40	54.15	79.67	56.88
Eswatini	-	64.41	60.47	55.30	67.92	75.76
Botswana	17	63.16	65.77	63.39	58.03	65.77
Senegal	19	57.58	53.20	67.22	77.37	39.74
Sao Tome and Principe	-	56.69	47.68	52.53	90.63	45.49
Gambia	8	56.59	66.07	59.33	74.32	35.20
Lesotho	18	55.78	26.19	73.55	72.02	69.78
Gabon	1	55.46	56.90	49.64	80.36	41.69
Kenya	22	55.29	38.72	79.92	85.36	35.37
Cameroon	13	55.06	52.74	63.24	75.97	36.27
Ghana	28	54.60	52.65	57.53	79.44	36.93
Rwanda	26	53.88	37.12	96.67	74.53	31.52
Togo	4	53.48	40.18	75.90	80.21	33.45
Comoros	-	52.68	55.63	72.77	80.81	23.55
Tanzania	12	51.68	39.45	87.33	79.78	25.95
Djibouti	-	50.96	51.88	55.29	80.22	29.30
Zimbabwe	20	49.80	25.62	76.71	73.57	42.53
Cote d'Ivoire	7	49.25	51.45	48.34	83.39	28.36
Uganda	16	47.27	22.47	89.43	83.47	29.76
Guinea	11	47.11	48.74	58.08	72.17	24.11
Malawi	21	47.04	38.26	77.18	55.28	30.01
Mali	25	46.76	47.11	67.77	67.12	22.32
Zambia	10	45.63	30.04	75.75	55.55	34.30
Nigeria	33	44.69	37.98	44.74	82.52	28.44
Congo Republic	-	44.18	43.71	47.52	62.37	29.41
Eritrea	-	42.92	35.58	59.91	-	37.10
Benin	15	41.71	46.38	48.97	71.96	18.51
Ethiopia	24	41.48	34.33	62.11	84.82	16.37
Sudan	40	40.72	50.09	37.99	74.64	19.35
Mozambique	27	40.65	36.93	71.00	31.24	33.33
Madagascar	37	40.18	32.92	53.22	71.05	20.93
Angola	36	40.07	36.74	61.71	52.57	21.62
Mauritania	32	39.91	51.20	42.23	46.24	25.37
Burundi	23	39.54	16.08	82.38	58.00	31.83

Table 16. Scores on pillars for social inclusion by region and rank *(continued)*

Country	Regional Rank	Social Inclusion	Indicator categories			
			Access to Basic Services and Resources	Gender Balance	Social Equity	Social Protection
Burkina Faso	9	37.18	35.44	45.02	45.30	26.43
Equatorial Guinea	-	36.94	33.23	71.79	-	21.14
Sierra Leone	31	35.99	24.90	53.82	49.34	25.37
Liberia	-	35.81	18.92	69.47	59.07	21.17
Niger	39	35.24	32.73	68.89	46.08	14.85
Somalia	-	34.95	21.72	62.49	64.87	16.94
Guinea-Bissau	-	30.43	33.80	14.59	76.61	22.70
DR Congo	-	30.19	20.19	49.66	45.37	18.27
South Sudan	-	28.86	28.45	74.12	79.06	4.16
Central African Republic	34	28.02	25.59	44.19	39.91	13.67
Chad	-	24.52	16.09	59.25	46.87	8.09
THE AMERICAS						
Canada	8	91.08	88.70	87.19	93.10	95.58
United States	1	85.68	85.34	74.96	90.03	93.59
Uruguay	5	84.14	84.75	73.43	88.16	91.37
Chile	4	83.07	94.75	73.50	85.61	79.89
Argentina	17	80.52	73.94	79.20	87.15	82.36
Mexico	10	79.04	65.08	85.97	84.56	82.50
Bolivia	12	78.52	65.67	95.10	89.76	67.82
Trinidad and Tobago	25	77.93	68.43	74.85	87.19	82.61
Costa Rica	6	76.77	68.88	81.26	81.75	75.91
Brazil	3	75.50	79.82	67.53	73.56	81.94
Guyana	23	75.08	61.25	85.39	71.34	85.16
Jamaica	9	73.90	72.20	68.67	83.41	72.12
Paraguay	2	72.77	57.39	76.83	83.52	76.15
St. Lucia	-	72.47	70.44	67.00	80.76	72.39
Grenada	--	72.34	70.99	96.70	70.49	56.60
Panama	7	71.80	72.43	64.14	79.89	71.61
El Salvador	11	71.11	70.20	72.17	85.06	59.33
Nicaragua	16	70.78	60.37	84.26	78.29	63.03
Ecuador	19	70.74	57.75	89.50	83.35	58.14
Barbados	26	70.52	79.79	45.55	81.45	83.56
Venezuela	13	70.09	55.70	71.74	75.81	79.66
Suriname	14	69.66	51.66	67.24	87.22	77.72
Colombia	15	68.91	72.40	61.03	71.51	71.36
Dominica	-	68.62	83.19	62.88	-	61.78
Peru	20	67.88	59.41	84.36	83.97	50.45
St. Kitts and Nevis	-	67.79	83.01	48.03	-	78.14
Dominican Republic	18	66.10	54.01	75.81	84.56	55.14
Belize	24	64.98	76.97	55.14	70.76	59.37
St. Vincent and the Grenadines	-	62.07	79.12	43.75	-	69.09
Antigua and Barbuda	-	61.25	56.34	49.12	-	83.04
Guatemala	21	60.12	65.27	61.03	76.34	42.96

Table 16. Scores on pillars for social inclusion by region and rank *(continued)*

Country	Regional Rank	Social Inclusion	Indicator categories			
			Access to Basic Services and Resources	Gender Balance	Social Equity	Social Protection
Bahamas	-	58.58	55.02	50.82	-	71.88
Honduras	22	54.77	49.59	54.93	76.12	43.40
Haiti	-	38.26	21.52	66.22	51.95	28.94
Cuba	-	-	74.49	-	-	75.51
Aruba	-	-	-	-	89.40	100.00
Bermuda	-	-	-	-	95.64	96.39
Curacao	-	-	-	-	88.82	-
Puerto Rico	-	-	65.69	85.22	-	-
Anguilla	-	-	-	-	-	82.46
British Virgin Islands	-	-	-	-	-	79.78
Cayman Islands	-	-	-	-	-	49.16
Martinique	-	-	-	-	-	85.98
Sint Maarten	-	-	-	-	-	98.48
Turks and Caicos Islands	-	-	-	-	-	67.74
United States Virgin Islands	-	-	-	-	-	96.95
ASIA						
Hong Kong	-	91.91	99.39	87.44	95.70	85.81
Israel	16	85.95	99.42	66.14	89.08	93.18
United Arab Emirates	20	84.14	80.72	99.79	95.28	65.29
Macau	-	83.88	84.12	-	96.81	72.48
Singapore	22	83.85	99.48	77.78	95.75	66.73
Cyprus	10	83.72	92.95	68.04	91.77	84.64
South Korea	14	82.03	90.75	54.83	97.37	93.46
Georgia	3	80.52	82.57	70.83	86.55	83.03
Armenia	13	78.55	76.87	72.58	89.09	76.59
Kazakhstan	18	78.42	75.66	59.19	94.66	89.23
Japan	1	78.42	88.05	48.72	96.27	91.58
Maldives	12	77.71	99.37	59.67	87.67	70.14
Turkmenistan	-	76.95	69.99	70.12	91.36	78.21
China	4	76.83	77.53	58.30	93.81	82.16
Mongolia	27	76.23	68.49	69.89	90.58	77.89
Kyrgyz Republic	15	75.40	76.38	54.02	92.05	85.10
Timor-Leste	30	74.88	60.78	90.10	86.46	66.41
Thailand	5	74.63	58.25	68.84	90.62	85.39
Saudi Arabia	36	73.92	70.41	76.13	88.24	63.11
Vietnam	9	72.12	68.07	70.37	91.59	61.64
Philippines	8	72.07	66.30	82.64	86.25	57.07
Tajikistan	24	71.94	66.22	64.59	79.20	79.08
Uzbekistan	40	70.36	66.59	60.32	-	86.71
Malaysia	7	69.65	80.16	59.74	89.88	54.69
Azerbaijan	17	69.56	82.78	39.91	95.15	74.49
Nepal	19	69.42	56.58	86.18	82.72	57.57
Iran	38	68.53	73.37	52.60	85.52	66.83

Table 16. Scores on pillars for social inclusion by region and rank *(continued)*

Country	Regional Rank	Social Inclusion	Indicator categories			
			Access to Basic Services and Resources	Gender Balance	Social Equity	Social Protection
Brunei Darussalam	21	68.25	64.05	47.12	87.20	82.46
Indonesia	11	67.13	59.63	72.68	93.45	50.14
Qatar	25	66.24	89.66	55.36	-	58.57
Jordan	33	62.37	52.86	56.86	83.22	60.51
Cambodia	23	61.75	58.24	71.67	95.34	36.53
Laos	2	60.58	56.00	76.50	85.53	36.75
India	31	59.95	60.44	52.23	85.15	48.05
Bhutan	6	59.90	52.35	71.15	91.12	37.94
Sri Lanka	28	59.33	69.36	45.77	86.43	45.16
Lebanon	35	59.25	52.89	46.84	88.04	56.49
Bangladesh	29	59.10	62.96	49.81	84.51	46.02
Iraq	41	58.68	49.44	61.12	82.98	47.30
Oman	34	57.42	69.91	39.36	-	68.79
Kuwait	39	57.22	79.00	36.26	-	65.40
Myanmar	26	56.58	64.11	59.58	90.06	29.79
Palestine	32	53.71	49.57	38.03	83.88	52.63
Syria	-	53.60	51.02	36.03	97.64	45.99
Bahrain	43	53.34	57.66	46.01	-	57.20
Pakistan	42	48.82	66.02	40.61	83.49	25.39
Afghanistan	37	37.05	51.95	21.99	71.93	22.94
Yemen	44	29.12	36.00	9.25	75.48	28.61
North Korea	-	-	30.10	-	-	66.16
EUROPE						
Finland	8	95.77	96.81	96.90	95.78	93.63
Sweden	6	95.59	95.02	97.55	96.74	93.13
Belgium	26	95.52	96.90	95.06	96.51	93.63
Norway	17	95.05	94.35	95.17	96.61	94.08
Denmark	2	94.67	97.69	93.18	96.10	91.83
Austria	3	94.59	98.37	93.68	93.26	93.17
Switzerland	1	94.53	97.20	94.39	93.19	93.40
France	13	94.07	97.14	92.85	93.17	93.18
Netherlands	14	94.02	94.97	89.81	98.34	93.18
Iceland	37	93.90	97.04	92.67	96.96	89.18
United Kingdom	9	93.83	98.22	89.74	93.07	94.50
Spain	24	93.48	97.32	94.76	92.52	89.50
Germany	4	93.44	96.69	87.66	95.15	94.54
Portugal	19	93.35	96.45	90.02	93.63	93.43
Luxembourg	22	92.79	98.56	87.19	93.50	92.27
Italy	11	91.75	94.86	90.51	89.03	92.72
Estonia	15	91.74	98.23	85.23	93.56	90.42
Czech Republic	5	91.27	95.24	81.56	96.34	92.71
Latvia	21	90.58	94.40	85.84	93.89	88.46
Croatia	20	90.40	91.86	87.37	93.95	88.57
Poland	25	90.31	95.88	85.64	95.64	84.71

Table 16. Scores on pillars for social inclusion by region and rank *(continued)*

Country	Regional Rank	Social Inclusion	Indicator categories			
			Access to Basic Services and Resources	Gender Balance	Social Equity	Social Protection
Belarus	10	90.28	95.55	76.83	100.00	90.47
Slovenia	16	90.04	95.36	77.19	96.48	92.55
Lithuania	18	89.98	94.90	84.71	92.06	88.56
Ireland	36	89.61	93.80	81.70	95.69	87.92
Greece	32	89.44	95.93	80.43	92.89	89.29
Slovakia	7	87.81	92.94	72.78	95.73	91.81
Malta	38	86.91	97.67	67.29	95.46	90.92
Bulgaria	28	86.73	89.59	82.83	89.30	85.39
Romania	27	86.17	88.02	78.13	90.10	88.98
Moldova	34	85.98	85.77	82.72	93.26	82.61
Hungary	12	85.38	95.93	66.92	94.47	87.62
Albania	23	82.66	76.19	85.46	87.85	81.60
Serbia	31	81.27	74.53	89.84	90.82	71.74
Russia	33	80.76	85.83	60.78	91.06	89.56
Montenegro	39	80.16	88.16	68.91	88.29	76.98
Macedonia	30	79.11	74.46	76.14	89.87	76.87
Bosnia and Herzegovina	29	76.91	83.25	61.02	90.21	76.34
Ukraine	35	74.78	83.14	46.38	92.68	87.48
Monaco	-	-	93.29	-	-	90.45
San Marino	-	-	90.90	71.12	-	-
Liechtenstein	-	-	97.71	-	-	-
Andorra	-	-	-	-	-	90.47
OCEANIA						
New Zealand	1	95.54	96.69	99.86	92.59	93.18
New Caledonia	-	90.22	93.78	-	78.88	99.27
Australia	3	89.94	93.91	87.13	93.39	85.62
Tonga	-	69.41	-	45.46	91.45	80.43
Palau	-	69.06	-	44.31	88.45	84.02
Kiribati	-	68.41	67.41	57.10	78.66	72.35
Marshall Islands	-	67.46	-	56.50	79.54	68.30
Fiji	2	64.77	56.11	45.16	89.41	77.70
Samoa	-	64.05	57.34	48.03	82.77	73.84
Micronesia, Fed. Sts.	-	58.16	-	38.13	81.59	63.23
Vanuatu	-	50.45	77.52	25.75	75.42	43.02
Solomon Islands	-	46.26	47.17	21.30	92.84	49.11
Papua New Guinea	4	28.61	25.91	13.38	68.58	28.18
Nauru	-	-	-	-	80.41	80.27
Tuvalu	-	-	-	-	64.70	73.58
Cook Islands	-	-	-	-	-	47.13
Niue	-	-	-	-	-	62.01
French Polynesia	-	-	65.61	-	-	-
Northern Mariana Islands	-	-	49.94	-	-	-

8.3 Normalized values of green growth indicators by dimension and region

Table 17. Normalized values of green growth indicators for efficient and sustainable resource use

Country	Regional Rank	Indicators											
		EE1	EE2	EE3	EW1	EW2	EW3	SL1	SL2	SL3	ME1	ME2	ME3
AFRICA													
Gabon	1	60.59	100.00	7.90	37.75	100.00	-	97.47	-	99.93	92.97	85.86	50.50
Mauritius	2	91.71	17.58	26.36	7.29	100.00	-	95.38	1.08	96.64	92.68	86.92	100.00
Seychelles	3	86.67	4.31	-	34.61	-	6.91	89.27	-	96.84	94.67	83.01	44.33
Togo	4	45.24	100.00	17.13	9.63	100.00	4.17	99.01	35.53	99.46	82.37	97.44	50.33
Cabo Verde	5	89.55	44.61	-	2.88	36.28	6.91	88.12	1.00	98.79	90.59	-	57.90
Namibia	6	82.35	58.76	26.74	12.30	100.00	17.47	98.89	1.00	99.98	74.13	70.40	53.13
Cote d'Ivoire	7	83.43	100.00	37.65	16.13	100.00	-	100.00	3.41	99.86	86.23	92.60	68.31
Gambia	8	84.80	94.57	15.63	5.35	100.00	55.48	97.02	1.08	99.24	76.78	-	35.91
Burkina Faso	9	68.08	100.00	22.75	6.31	100.00	-	100.00	6.24	98.83	59.69	94.86	56.59
Zambia	10	50.86	100.00	19.68	6.17	100.00	-	86.26	1.08	99.83	56.78	90.19	49.64
Guinea	11	70.24	100.00	9.16	4.37	100.00	13.57	97.29	1.08	99.43	1.00	86.66	56.25
Tanzania	12	61.24	100.00	34.67	4.17	100.00	-	100.00	6.99	99.26	-	96.24	33.00
Cameroon	13	76.73	100.00	21.92	10.85	100.00	2.80	100.00	1.17	99.18	80.86	95.02	56.43
South Africa	14	59.87	19.68	47.15	6.69	17.06	1.95	90.63	1.42	99.81	88.25	80.90	73.25
Benin	15	72.69	100.00	26.90	16.54	100.00	3.32	100.00	11.15	99.21	78.72	95.23	61.77
Uganda	16	33.71	100.00	21.26	16.23	100.00	-	100.00	30.20	98.88	76.94	96.84	61.03
Botswana	17	87.90	53.70	36.46	25.36	100.00	-	82.33	-	100.00	87.30	74.85	75.63
Lesotho	18	32.13	65.77	11.63	16.58	100.00	-	97.77	1.00	99.76	6.48	75.58	46.22
Senegal	19	81.41	69.22	10.82	3.03	100.00	6.70	97.37	1.33	99.23	77.41	93.11	60.29
Zimbabwe	20	1.00	100.00	6.55	2.14	58.24	-	99.35	1.08	99.70	75.85	94.44	56.75
Malawi	21	85.30	100.00	21.60	2.88	100.00	-	73.96	1.08	98.99	56.36	96.48	64.32
Kenya	22	72.91	100.00	29.01	6.83	83.68	1.74	94.53	6.24	98.79	85.73	95.10	60.09
Burundi	23	53.31	100.00	4.72	3.34	100.00	-	97.93	1.17	99.18	59.99	98.98	59.97
Ethiopia	24	58.28	100.00	14.84	2.84	85.63	-	94.81	6.16	97.96	70.88	96.22	51.94
Mali	25	60.88	100.00	21.74	1.54	100.00	-	99.89	1.33	99.51	48.29	92.02	57.13
Rwanda	26	81.34	100.00	34.17	5.86	100.00	-	97.24	3.08	98.88	83.16	97.54	44.24
Mozambique	27	21.10	100.00	24.78	3.68	100.00	7.23	96.67	1.33	99.95	76.54	97.23	51.40
Ghana	28	86.45	76.21	20.94	13.50	100.00	4.27	100.00	5.74	99.58	72.36	87.36	54.08
Morocco	29	84.58	21.99	20.11	3.50	49.02	7.12	100.00	1.33	99.60	87.74	90.64	58.08
Tunisia	30	79.75	23.30	21.07	5.14	1.00	-	95.83	25.25	99.61	88.85	89.06	54.50
Sierra Leone	31	67.65	100.00	5.19	4.59	100.00	72.69	99.53	42.01	99.60	65.59	97.05	40.26
Mauritania	32	81.70	43.53	13.37	2.38	100.00	-	92.67	-	99.88	63.72	84.71	54.70
Nigeria	33	59.87	100.00	19.86	12.52	100.00	3.64	99.41	1.67	99.41	90.95	95.90	48.38
Central African Republic	34	46.61	100.00	7.46	7.41	100.00	-	95.74	-	98.93	43.78	97.08	56.21
Algeria	35	66.78	1.23	17.15	6.21	1.00	-	100.00	1.00	99.78	87.54	87.43	60.58
Angola	36	84.87	100.00	4.15	45.15	100.00	25.50	98.81	1.00	99.88	92.02	93.03	59.88
Madagascar	37	39.84	100.00	15.25	1.07	100.00	39.86	99.66	3.33	99.83	70.12	98.26	42.68
Egypt	38	85.16	12.77	29.33	2.76	1.00	-	27.63	24.79	97.74	86.86	-	41.72

Table 17. Normalized values of green growth indicators for efficient and sustainable resource use *(continued)*

Country	Regional Rank	Indicators											
		EE1	EE2	EE3	EW1	EW2	EW3	SL1	SL2	SL3	ME1	ME2	ME3
Niger	39	69.81	100.00	4.92	1.85	100.00	-	100.00	1.00	99.56	50.55	95.42	46.07
Sudan	40	72.40	100.00	16.49	2.64	1.00	-	96.51	1.50	99.61	83.69	94.40	42.20
Libya	41	69.31	7.01	6.10	4.50	1.00	-	98.41	-	99.88	83.00	70.35	61.16
Chad	-	75.93	100.00	16.16	3.92	100.00	-	95.82	-	98.94	36.01	89.89	25.56
Comoros	-	76.44	80.33	20.67	27.29	100.00	76.50	100.00	5.41	99.46	85.06	97.99	61.08
Congo Republic	-	58.79	100.00	18.37	33.94	100.00	3.11	100.00	-	100.00	87.29	-	46.95
Djibouti	-	92.22	52.16	23.18	-	100.00	4.27	7.83	-	99.75	85.04	86.39	51.02
DR Congo	-	17.07	100.00	-	21.06	100.00	-	100.00	3.75	99.96	56.97	-	70.29
Equatorial Guinea	-	69.88	11.11	12.93	-	100.00	2.58	100.00	-	99.83	98.01	89.12	-
Eritrea	-	61.31	100.00	5.48	2.00	100.00	-	98.04	-	99.66	56.80	95.07	-
Eswatini	-	79.03	100.00	-	2.22	1.00	-	100.00	2.66	99.51	80.75	-	65.10
Guinea-Bissau	-	55.76	100.00	15.18	2.59	100.00	21.70	91.16	10.98	98.79	72.02	98.63	42.15
Liberia	-	6.26	100.00	10.07	2.35	100.00	-	97.30	2.16	99.85	53.45	96.07	41.88
Sao Tome and Principe	-	78.60	79.49	23.78	3.84	100.00	49.68	97.31	100.00	99.51	90.26	98.73	49.29
Somalia	-	59.87	100.00	9.41	1.10	100.00	-	95.69	1.00	99.66	64.51	95.98	22.99
South Sudan	-	64.84	63.39	-	4.07	100.00	-	93.44	-	99.46	51.98	94.99	50.97
Reunion	-	-	32.59	-	-	100.00	-	-	44.68	93.77	-	-	-
Mayotte	-	-	20.18	-	-	-	-	-	12.69	-	-	-	-
St. Helena	-	-	20.55	-	-	-	-	-	-	-	-	-	-
THE AMERICAS													
United States	1	76.66	21.99	63.60	17.91	93.74	1.11	-	5.16	99.48	97.79	-	72.61
Paraguay	2	82.71	100.00	27.95	6.26	100.00	-	88.31	6.82	99.01	80.39	69.58	64.76
Brazil	3	78.67	90.52	34.53	8.86	100.00	-	69.59	4.74	98.73	86.45	72.51	62.03
Chile	4	82.28	47.55	45.24	3.59	100.00	2.16	64.34	15.64	99.35	77.72	30.23	62.28
Uruguay	5	86.02	100.00	24.81	5.73	100.00	1.32	59.36	100.00	98.91	92.95	69.36	71.76
Costa Rica	6	92.87	66.79	28.26	7.17	100.00	1.21	51.86	6.66	98.83	94.62	83.75	55.88
Panama	7	97.05	54.85	43.91	18.32	100.00	4.70	77.33	3.25	98.91	91.67	74.30	62.31
Canada	8	60.01	46.92	58.48	17.79	100.00	1.63	85.39	20.84	99.56	92.99	9.14	62.01
Jamaica	9	79.47	21.20	19.43	9.97	100.00	3.32	93.68	1.08	98.61	90.41	86.66	63.39
Mexico	10	85.66	25.98	36.65	5.36	60.36	1.74	86.61	3.33	99.28	92.66	83.38	52.60
El Salvador	11	83.72	43.20	21.27	8.09	100.00	2.90	87.19	2.41	98.91	90.71	91.28	60.35
Bolivia	12	79.18	25.58	14.25	5.75	100.00	-	-	3.50	99.51	73.79	80.44	61.53
Venezuela	13	47.26	65.89	10.07	2.27	100.00	-	77.91	1.08	98.93	87.99	-	46.79
Suriname	14	73.05	28.91	-	3.32	100.00	15.99	70.29	1.58	97.96	72.10	65.06	48.69
Colombia	15	90.42	58.20	33.10	4.67	100.00	1.42	62.49	3.00	99.08	93.35	87.99	71.59
Nicaragua	16	76.29	98.00	19.83	3.85	100.00	4.06	86.59	6.07	98.54	69.16	87.36	46.75
Argentina	17	82.78	18.80	31.34	5.50	100.00	3.01	93.01	26.21	99.45	92.08	75.08	75.63
Dominican Republic	18	92.00	29.54	24.06	4.20	71.19	-	94.93	68.30	97.12	94.31	89.38	62.20
Ecuador	19	83.72	37.40	31.16	4.08	100.00	3.32	70.47	10.57	98.51	91.10	89.03	53.61
Peru	20	90.63	59.86	25.07	2.64	100.00	3.64	83.72	20.72	99.46	84.23	74.70	56.80
Guatemala	21	75.36	100.00	16.07	8.09	100.00	1.21	87.03	13.65	98.56	88.20	88.37	53.37
Honduras	22	76.80	89.43	22.19	5.68	100.00	1.32	76.71	16.39	98.74	85.56	92.05	48.31

Table 17. Normalized values of green growth indicators for efficient and sustainable resource use *(continued)*

Country	Regional Rank	Indicators											
		EE1	EE2	EE3	EW1	EW2	EW3	SL1	SL2	SL3	ME1	ME2	ME3
Guyana	23	87.03	26.42	14.25	2.78	100.00	4.80	91.59	4.33	99.41	88.58	70.60	82.81
Belize	24	72.76	52.16	-	7.48	100.00	3.85	71.50	3.33	99.09	82.79	73.81	58.25
Trinidad and Tobago	25	1.00	1.89	16.10	21.10	100.00	1.42	9.10	-	86.85	96.28	80.46	51.27
Barbados	26	78.31	11.52	-	17.14	1.00	1.42	43.28	-	90.12	97.75	93.46	63.70
Antigua and Barbuda	-	72.40	2.73	-	37.76	100.00	7.86	84.83	-	98.33	95.78	88.56	59.31
Bahamas	-	86.53	3.14	19.65	-	-	5.22	76.42	4.16	95.47	97.57	-	65.00
Cuba	-	97.48	41.27	9.04	5.46	100.00	-	98.23	1.25	99.08	94.33	89.45	62.97
Dominica	-	85.37	18.01	-	-	100.00	4.06	99.33	97.75	99.16	97.17	96.89	63.50
Grenada	-	87.17	20.68	-	-	100.00	8.71	100.00	11.82	98.29	96.77	97.05	50.16
Haiti	-	64.84	100.00	6.29	3.66	100.00	3.32	95.53	2.75	98.31	91.14	98.71	17.26
Puerto Rico	-	100.00	5.95	-	11.32	100.00	-	61.98	1.08	96.25	99.54	99.32	-
St. Kitts and Nevis	-	88.26	4.16	-	-	48.86	2.80	95.06	-	98.86	97.44	-	53.99
St. Lucia	-	83.07	19.63	-	-	100.00	-	86.43	3.08	97.21	95.22	-	42.22
Aruba	-	84.65	17.87	-	-	-	-	-	-	-	97.62	87.82	-
Bermuda	-	96.25	2.73	-	-	100.00	1.53	-	-	-	99.34	88.17	-
St. Vincent and the Grenadines	-	89.48	10.59	-	-	100.00	4.80	92.12	-	98.11	94.56	-	61.40
Turks and Caicos Islands	-	64.33	2.46	-	-	-	2.58	-	-	-	98.01	93.73	-
Cayman Islands	-	93.30	1.02	-	-	-	1.21	-	-	-	99.54	94.36	-
Curacao	-	32.34	6.30	-	-	-	-	-	-	-	100.00	-	-
Sint Maarten	-	51.72	1.10	-	-	-	-	-	-	-	100.00	-	-
British Virgin Islands	-	-	3.52	-	-	-	-	-	4.08	-	99.70	98.61	-
French Guiana	-	-	57.63	-	-	-	-	-	80.70	99.04	-	-	-
Greenland	-	-	23.42	-	-	-	100.00	-	-	-	99.23	88.77	-
Guadeloupe	-	-	6.78	-	-	-	-	-	26.04	97.96	-	-	-
Martinique	-	-	5.89	-	-	-	-	-	28.95	98.58	-	-	-
Montserrat	-	-	5.08	-	-	-	1.95	-	-	-	100.00	-	-
Anguilla	-	-	2.48	-	-	-	14.52	-	-	-	98.91	-	-
Falkland Islands	-	-	9.49	-	-	-	-	-	24.38	-	-	-	-
United States Virgin Islands	-	-	12.36	-	-	-	-	-	8.57	-	-	-	-
Bonaire, Saint Eustatius and Saba	-	-	23.17	-	-	-	-	-	-	-	-	-	-
St. Pierre and Miquelon	-	-	3.41	-	-	-	-	-	-	-	-	-	-
ASIA													
Japan	1	83.79	18.03	68.15	21.73	78.12	-	80.35	3.16	96.77	98.24	78.78	78.73
Laos	2	76.58	100.00	25.30	1.56	100.00	-	94.22	5.24	96.72	67.32	-	63.05
Georgia	3	79.39	49.50	16.98	4.28	100.00	1.32	72.44	2.83	99.46	84.66	82.35	66.08
China	4	61.81	30.30	54.55	12.43	67.29	-	55.92	5.66	99.19	87.16	70.28	79.75
Thailand	5	75.21	37.54	48.28	3.52	100.00	3.96	85.40	7.36	99.46	89.75	83.06	46.70
Bhutan	6	37.17	100.00	8.13	2.76	100.00	-	91.84	10.57	99.31	48.91	62.13	76.99

Table 17. Normalized values of green growth indicators for efficient and sustainable resource use *(continued)*

Country	Regional Rank	Indicators											
		EE1	EE2	EE3	EW1	EW2	EW3	SL1	SL2	SL3	ME1	ME2	ME3
Malaysia	7	74.85	15.41	42.13	22.58	100.00	5.54	94.73	1.17	99.28	89.47	64.95	29.93
Philippines	8	87.17	54.99	31.88	2.26	95.62	6.28	95.14	15.97	98.93	89.20	89.69	67.39
Vietnam	9	79.47	47.67	43.85	2.13	100.00	8.71	63.92	4.83	97.72	84.37	82.16	61.71
Cyprus	10	89.55	31.10	39.87	29.40	85.90	1.11	71.25	53.41	98.26	96.01	57.05	70.55
Indonesia	11	85.30	39.89	39.84	2.36	90.69	11.03	86.01	2.25	98.68	88.75	89.33	42.73
Maldives	12	86.53	3.66	24.18	-	100.00	26.55	82.42	-	-	91.09	83.84	1.00
Armenia	13	79.03	18.59	22.31	2.09	31.00	-	61.43	1.33	99.53	72.72	73.17	70.42
South Korea	14	68.87	8.03	54.78	21.89	1.00	-	23.98	21.80	92.50	96.96	-	67.03
Kyrgyz Republic	15	70.10	54.22	20.32	1.10	50.42	-	84.76	3.25	99.73	68.47	-	77.85
Israel	16	89.98	12.94	44.94	48.92	1.00	-	67.23	7.82	97.76	97.02	62.26	68.04
Azerbaijan	17	73.12	3.54	17.16	2.17	36.11	-	91.29	7.66	99.09	91.77	84.57	74.49
Kazakhstan	18	65.34	4.83	28.85	3.76	81.98	-	100.00	1.42	99.98	84.23	51.86	83.52
Nepal	19	66.64	100.00	19.25	1.78	100.00	-	79.88	3.33	96.46	61.97	92.26	65.62
United Arab Emirates	20	67.72	2.95	65.91	30.50	1.00	-	40.14	12.48	95.09	97.19	17.76	39.60
Brunei Darussalam	21	61.60	1.06	25.50	-	100.00	3.85	1.00	-	72.85	100.00	50.72	-
Singapore	22	89.12	3.12	67.19	-	1.00	-	1.00	19.88	1.00	97.98	25.87	-
Cambodia	23	71.47	100.00	21.37	3.75	100.00	7.02	89.94	5.16	99.24	65.05	90.38	40.39
Tajikistan	24	78.17	68.20	13.64	1.18	11.02	-	86.22	4.70	99.26	78.66	94.17	72.64
Qatar	25	55.33	1.06	50.32	69.58	1.00	-	72.48	-	93.48	96.96	1.00	38.01
Myanmar	26	77.16	100.00	12.29	1.35	100.00	19.58	86.34	1.67	98.59	85.66	94.32	40.51
Mongolia	27	57.06	6.84	14.73	9.35	100.00	-	52.81	1.00	99.88	31.03	27.28	99.69
Sri Lanka	28	95.17	94.99	21.99	3.16	1.00	6.17	100.00	21.13	99.43	94.79	95.65	64.03
Bangladesh	29	93.30	49.23	21.30	4.10	100.00	3.53	45.69	1.08	96.35	89.77	96.42	57.83
Timor-Leste	30	89.55	24.38	-	1.37	93.53	-	87.59	79.70	98.29	83.22	94.31	16.72
India	31	76.87	68.26	40.70	1.94	17.85	3.01	66.87	13.40	98.33	83.72	94.22	75.02
Palestine	32	84.65	30.66	-	11.43	54.96	-	-	11.23	99.13	89.35	-	-
Jordan	33	82.78	23.15	24.90	13.21	1.00	-	84.75	2.16	98.81	89.92	90.24	45.11
Oman	34	55.26	1.19	41.35	17.44	1.00	7.12	83.05	1.00	99.04	90.29	41.08	65.57
Lebanon	35	81.63	14.14	25.84	7.27	33.10	-	91.07	2.83	97.98	88.01	82.06	52.73
Saudi Arabia	36	65.34	1.15	35.35	9.90	1.00	-	84.97	1.08	100.00	94.03	58.77	57.02
Afghanistan	37	86.02	39.48	1.00	1.00	41.08	-	100.00	1.00	99.76	81.54	99.31	19.97
Iran	38	40.05	2.75	30.23	2.50	1.00	2.80	82.40	1.08	99.28	89.42	-	63.73
Kuwait	39	51.36	1.13	30.50	36.68	1.00	1.11	1.00	1.17	92.21	93.44	20.69	59.83
Uzbekistan	40	52.81	2.93	21.32	1.72	1.00	-	42.08	1.08	99.30	81.48	87.49	85.11
Iraq	41	71.47	3.12	8.36	2.35	31.53	1.21	97.85	1.00	99.46	93.24	88.71	2.89
Pakistan	42	76.87	81.05	16.21	1.46	1.00	2.16	59.15	2.58	96.51	85.27	96.40	44.53
Bahrain	43	40.70	1.04	32.88	29.33	1.00	1.53	75.41	-	93.88	94.41	41.87	41.15
Yemen	44	92.29	8.07	11.24	2.56	1.00	12.83	100.00	-	99.73	84.67	-	9.36
Hong Kong	-	98.78	1.81	64.73	-	-	-	1.00	-	69.46	97.61	-	-
Turkmenistan	-	33.86	1.12	15.91	1.53	1.00	-	31.41	-	99.88	89.53	75.91	71.01
North Korea	-	60.52	29.35	-	1.37	94.57	-	98.28	-	99.03	58.09	-	-
Syria	-	-	3.20	12.22	1.11	1.00	-	100.00	2.16	99.75	79.94	-	19.63

Table 17. Normalized values of green growth indicators for efficient and sustainable resource use *(continued)*

Country	Regional Rank	Indicators											
		EE1	EE2	EE3	EW1	EW2	EW3	SL1	SL2	SL3	ME1	ME2	ME3
Macau	-	100.00	27.21	-	-	-	-	-	-	-	98.95	-	-
Taiwan	-	-	-	54.38	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	39.70	-	-	-	-	-	-	-	-	-
EUROPE													
Switzerland	1	96.18	54.33	64.13	100.00	100.00	-	44.82	100.00	97.91	99.31	68.37	66.83
Denmark	2	93.08	77.12	67.05	100.00	97.23	1.74	73.70	97.67	97.09	97.44	58.58	85.72
Austria	3	86.60	70.34	68.16	43.30	100.00	-	79.01	100.00	98.48	97.72	64.46	80.47
Germany	4	87.75	34.92	73.83	46.90	79.51	1.00	82.78	81.45	98.43	97.99	69.16	83.49
Czech republic	5	77.23	34.05	56.98	52.78	100.00	-	72.10	100.00	99.45	95.23	-	90.00
Sweden	6	82.06	100.00	69.03	90.08	100.00	1.11	80.37	100.00	99.09	97.08	54.64	89.33
Slovakia	7	77.38	35.48	35.87	57.81	100.00	-	80.16	100.00	99.60	96.01	-	87.40
Finland	8	70.10	97.73	66.32	23.87	100.00	1.42	89.36	100.00	99.21	94.38	48.14	90.07
United Kingdom	9	91.35	24.40	66.90	100.00	100.00	1.21	59.83	25.13	98.56	98.92	77.86	86.85
Belarus	10	62.68	16.83	21.24	13.43	100.00	-	73.51	-	99.33	-	75.31	89.17
Italy	11	89.12	34.78	58.89	18.93	90.79	1.11	76.25	100.00	98.86	98.36	83.93	77.70
Hungary	12	82.13	30.47	48.53	10.61	100.00	-	79.91	54.41	99.50	94.92	73.53	91.66
France	13	83.93	32.30	62.29	34.80	100.00	1.21	80.65	85.52	98.76	98.19	79.23	85.49
Netherlands	14	85.95	24.54	67.94	35.06	100.00	1.32	43.00	37.94	93.36	98.81	49.18	92.72
Estonia	15	80.33	74.15	45.06	10.01	100.00	1.84	85.03	100.00	99.63	92.11	45.96	93.47
Slovenia	16	83.72	46.05	45.17	18.81	100.00	1.00	77.27	73.46	98.94	96.34	64.17	69.16
Norway	17	82.49	100.00	57.51	52.93	100.00	6.39	46.46	39.85	97.62	98.27	16.89	76.71
Lithuania	18	86.02	64.98	35.56	65.21	100.00	1.53	86.22	71.92	99.70	93.19	58.30	88.67
Portugal	19	89.77	63.27	55.78	11.94	100.00	2.58	76.00	66.47	99.03	95.45	77.79	66.25
Croatia	20	86.24	66.62	38.36	18.47	100.00	1.74	72.31	65.39	99.28	95.50	78.69	94.75
Latvia	21	84.87	85.73	28.85	54.64	100.00	1.53	89.69	100.00	99.78	94.17	61.92	84.65
Luxembourg	22	92.94	40.50	55.36	100.00	100.00	-	72.45	41.85	97.61	98.70	14.47	88.79
Albania	23	90.85	81.72	23.99	5.66	100.00	-	77.91	1.50	99.11	91.08	85.34	82.51
Spain	24	88.04	37.52	61.87	14.88	63.87	1.63	82.14	89.68	98.99	98.08	81.23	90.03
Poland	25	82.56	30.28	52.43	20.08	85.98	1.11	87.72	33.53	99.09	93.19	71.97	91.73
Belgium	26	79.39	23.50	68.58	37.90	46.78	1.11	10.28	63.31	95.20	98.23	35.98	92.49
Romania	27	89.91	46.42	-	9.82	100.00	1.11	90.80	43.26	99.65	85.75	75.76	93.23
Bulgaria	28	73.20	40.25	36.09	4.49	75.21	1.00	84.17	19.30	99.85	83.91	69.66	99.58
Bosnia and Herzegovina	29	64.77	71.51	28.80	-	100.00	-	89.73	1.92	99.65	88.17	75.79	81.87
Macedonia	30	83.79	38.52	25.45	2.85	74.32	-	92.13	6.74	99.71	90.62	78.23	79.88
Serbia	31	71.40	53.39	29.85	3.54	100.00	-	98.89	6.99	99.28	83.53	71.88	83.87
Greece	32	87.68	42.35	41.60	7.14	100.00	1.53	89.59	79.49	99.56	96.45	79.91	76.27
Russia	33	46.25	7.82	27.13	8.17	100.00	-	98.17	3.37	99.86	91.31	72.84	99.16
Moldova	34	71.76	42.28	17.40	4.27	100.00	-	100.00	11.65	99.55	75.74	82.49	80.75
Ukraine	35	57.56	18.08	29.50	3.68	100.00	-	100.00	6.32	99.85	65.46	81.71	86.82
Ireland	36	99.35	25.44	51.49	99.25	100.00	1.32	21.01	19.88	97.42	98.60	52.12	84.99
Iceland	37	18.36	100.00	42.26	23.89	100.00	32.89	62.21	3.66	99.91	95.55	52.79	87.83
Malta	38	98.49	17.60	28.97	81.14	1.00	1.00	29.55	7.24	96.56	97.80	57.74	62.68
Montenegro	39	81.77	77.35	26.77	8.72	-	1.00	1.00	13.98	99.53	83.35	80.58	70.11

Table 17. Normalized values of green growth indicators for efficient and sustainable resource use *(continued)*

Country	Regional Rank	Indicators											
		EE1	EE2	EE3	EW1	EW2	EW3	SL1	SL2	SL3	ME1	ME2	ME3
Andorra	-	93.59	36.42	-	-	-	-	-	1.08	-	93.55	59.31	-
Faeroe Islands	-	-	10.78	-	-	-	100.00	1.00	3.16	99.90	-	82.29	-
Liechtenstein	-	-	100.00	-	-	-	-	-	100.00	-	99.98	100.00	-
Kosovo	-	66.21	47.21	-	-	-	-	-	-	-	-	-	-
Monaco	-	-	-	-	-	-	-	-	-	-	100.00	100.00	-
San Marino	-	-	-	-	-	-	-	-	-	-	99.93	100.00	-
Gibraltar	-	-	1.00	-	-	-	-	-	-	-	-	1.00	-
Guernsey	-	-	3.83	-	-	-	-	-	-	-	-	-	-
Isle of Man	-	-	7.09	-	-	-	-	-	-	-	-	-	-
Jersey	-	-	37.09	-	-	-	-	-	-	-	-	-	-
OCEANIA													
New Zealand	1	80.04	56.57	63.30	15.78	100.00	6.39	93.87	7.74	98.06	96.74	48.71	75.53
Fiji	2	90.85	58.20	14.03	13.62	100.00	5.75	99.61	52.00	99.04	92.39	-	70.63
Australia	3	77.66	24.73	59.28	29.80	100.00	-	96.37	82.70	99.91	95.36	1.00	71.09
Papua New Guinea	4	60.08	100.00	8.29	-	100.00	-	100.00	12.65	99.45	82.99	89.43	68.03
French Polynesia	-	88.47	15.33	-	-	-	22.33	100.00	7.66	99.48	98.31	96.00	68.40
Cook Islands	-	-	17.87	-	-	-	5.12	82.51	7.57	94.83	98.63	-	-
Kiribati	-	57.85	82.34	-	-	-	-	100.00	40.18	99.58	77.37	95.64	69.49
Marshall Islands	-	32.85	24.23	-	-	-	84.31	-	-	-	95.54	97.19	80.49
Micronesia, Fed. Sts.	-	60.66	5.01	-	-	-	100.00	100.00	-	92.96	88.70	-	56.35
Nauru	-	57.20	4.18	-	-	-	-	100.00	-	97.31	85.91	89.29	80.60
New Caledonia	-	18.22	17.04	-	-	-	-	72.31	4.58	99.41	90.99	41.74	65.34
Palau	-	11.59	2.68	-	-	-	14.30	-	-	-	95.60	91.76	-
Samoa	-	71.90	70.24	-	-	-	18.63	100.00	100.00	97.96	90.11	95.47	70.50
Solomon Islands	-	70.67	95.63	21.13	-	-	-	100.00	53.66	99.73	83.12	94.17	82.49
Tonga	-	73.70	4.41	-	-	-	20.53	100.00	22.38	98.28	92.58	96.66	73.82
Tuvalu	-	87.10	10.71	-	-	-	-	85.41	-	96.81	97.62	99.22	66.28
Vanuatu	-	69.95	48.46	-	-	-	5.65	100.00	11.32	99.26	86.03	95.27	53.65
Niue	-	-	6.80	-	-	-	-	100.00	21.30	99.81	-	-	-
Northern Mariana Islands	-	-	1.92	-	-	-	-	-	-	-	-	100.00	-
American Samoa	-	-	1.75	-	-	-	-	-	-	-	-	100.00	-
Guam	-	-	9.67	-	-	-	-	-	-	-	-	100.00	-
Wallis and Futuna Islands	-	-	7.43	-	-	-	-	-	-	-	-	-	-
Tokelau	-	-	-	-	-	-	-	-	-	98.24	-	-	-

Table 17. Normalized values of green growth indicators for efficient and sustainable resource use *(continued)*

Country	Regional Rank	Indicators											
		EE1	EE2	EE3	EW1	EW2	EW3	SL1	SL2	SL3	ME1	ME2	ME3

Definitons:
EE1: Ratio of total primary energy supply to GDP (MJ per $2011 PPP GDP)
EE2: Share of renewable to total final energy consumption (Percent)
EE3: Logistics performance index (Index)
EW1: Water use efficiency (USD per m3)
EW2: Share of freshwater withdrawal to available freshwater resources (Percent)
EW3: Sustainable fisheries as a proportion of GDP (Ratio)
SL1: Nutrient balance per unit area (Tons per hectare)
SL2: Share agriculture organic to total agriculture land area (Percent)
SL3: Livestock units per agricultural land area (LSU/ha)
ME1: Domestic material consumption per unit of GDP (kilograms per constant 2015 USD)
ME2: Total material footprint (MF) per capita (Tons per capita)
ME3: Average of food loss to production and food waste to consumption (Percent)

Table 18. Normalized values of green growth indicators for natural capital protection

Country	Regional Rank	Indicators											
		EQ1	EQ2	EQ3	GE1	GE2	GE3	BE1	BE2	BE3	CV1	CV2	CV3
AFRICA													
Gabon	1	63.83	81.73	84.41	75.76	75.11	92.60	74.36	100.00	52.56	92.71	4.56	100.00
Mauritius	2	93.35	98.31	75.29	86.14	50.47	96.55	12.11	100.00	29.68	6.45	66.92	1.08
Seychelles	3	92.47	95.33	61.20	70.53	61.83	100.00	73.86	100.00	40.91	50.98	100.00	100.00
Togo	4	51.03	14.13	89.12	98.75	91.67	89.23	80.70	100.00	28.93	79.78	17.10	100.00
Cabo Verde	5	44.39	85.44	81.64	95.89	96.62	94.67	13.58	67.50	22.94	85.35	100.00	1.11
Namibia	6	80.80	29.86	88.32	71.96	88.29	20.35	88.30	47.46	16.57	95.69	43.15	100.00
Cote d'Ivoire	7	38.30	46.70	84.52	93.82	94.76	93.15	80.30	50.88	22.81	85.87	24.71	100.00
Gambia	8	34.97	53.74	89.54	98.47	92.20	84.57	60.74	100.00	10.65	93.89	41.24	22.18
Burkina Faso	9	40.94	1.00	89.92	93.91	97.24	67.10	69.07	100.00	12.04	97.77	-	100.00
Zambia	10	78.46	40.63	87.02	89.97	89.99	28.10	56.53	100.00	11.16	80.50	-	100.00
Guinea	11	42.50	34.54	94.85	94.52	89.09	54.63	76.02	100.00	31.30	83.44	9.27	100.00
Tanzania	12	80.06	36.09	86.57	94.45	86.68	67.98	58.61	100.00	12.22	51.27	25.21	100.00
Cameroon	13	26.33	40.46	89.29	92.60	35.54	84.61	34.68	100.00	62.21	75.51	14.17	81.49
South Africa	14	74.74	58.07	74.57	67.73	79.81	84.24	40.32	82.68	20.78	64.78	35.93	94.41
Benin	15	50.15	27.84	91.21	93.41	93.62	86.35	23.00	100.00	24.92	85.84	8.66	100.00
Uganda	16	65.89	49.40	85.73	98.44	90.39	79.59	69.44	67.70	23.17	61.10	-	100.00
Botswana	17	80.09	38.77	92.61	10.01	73.40	37.57	35.06	100.00	36.85	96.25	-	100.00
Lesotho	18	76.30	1.00	97.42	95.58	79.27	81.44	52.16	7.62	18.02	90.76	-	4.69
Senegal	19	32.09	64.89	88.70	96.16	87.21	79.31	27.23	100.00	11.22	89.59	22.98	100.00
Zimbabwe	20	85.35	26.78	91.80	70.72	88.36	77.60	85.03	100.00	22.93	67.51	-	100.00
Malawi	21	83.30	22.00	94.50	98.22	89.14	87.56	53.68	100.00	19.17	69.89	-	100.00
Kenya	22	84.29	42.61	90.42	99.51	93.69	73.45	38.57	37.95	47.28	65.41	23.00	78.04
Burundi	23	68.51	12.84	80.23	99.14	98.20	91.59	75.59	64.41	28.57	84.35	-	56.67
Ethiopia	24	67.84	26.51	95.42	98.58	91.95	70.28	18.05	88.70	29.01	75.95	-	100.00
Mali	25	31.53	14.63	91.44	99.68	96.81	50.51	75.79	64.46	11.71	96.58	-	56.20
Rwanda	26	64.59	53.58	73.77	99.65	98.29	91.94	48.28	66.39	34.73	82.17	-	67.77
Mozambique	27	85.43	32.26	93.53	91.26	93.02	60.27	49.96	100.00	24.41	67.50	14.23	100.00
Ghana	28	40.51	66.37	88.35	93.96	86.52	90.63	69.39	100.00	23.32	73.85	11.27	57.35
Morocco	29	66.12	94.63	85.81	91.92	92.83	87.02	59.89	76.07	10.21	82.40	62.75	12.62
Tunisia	30	72.37	97.75	82.76	90.28	87.50	88.33	41.98	27.40	14.57	92.02	63.85	39.20
Sierra Leone	31	44.42	13.52	92.07	98.02	94.72	84.87	64.68	100.00	19.94	89.89	7.57	38.37
Mauritania	32	23.16	60.18	90.83	97.62	97.92	35.33	12.98	2.74	13.27	95.45	20.28	8.93
Nigeria	33	18.32	1.00	87.30	96.92	88.56	88.72	57.05	100.00	32.12	77.26	7.84	86.13
Central African Republic	34	50.80	1.00	82.57	87.58	1.00	1.00	73.33	100.00	51.13	90.11	-	100.00
Algeria	35	69.12	97.75	78.28	82.32	68.74	91.22	56.58	5.79	7.79	87.35	16.93	33.27
Angola	36	75.09	42.63	88.08	92.56	86.26	61.59	37.94	100.00	8.00	89.23	4.26	37.70
Madagascar	37	89.37	1.00	89.27	98.59	97.38	74.60	32.62	100.00	38.69	60.84	26.13	23.62
Egypt	38	21.71	95.39	82.99	90.78	88.89	91.20	37.45	1.26	28.71	86.19	43.58	85.71
Niger	39	5.18	1.00	85.00	99.95	88.55	61.68	71.26	5.91	9.82	89.25	-	100.00
Sudan	40	39.58	85.00	94.86	96.03	93.50	47.68	17.28	57.70	13.93	87.64	9.35	21.19
Libya	41	61.33	97.67	75.29	67.69	1.00	86.17	1.00	1.72	12.38	96.25	5.90	2.61
Chad	-	33.35	1.00	91.92	93.33	86.78	1.00	59.97	20.43	22.07	86.43	-	100.00

Table 18. Normalized values of green growth indicators for natural capital protection *(continued)*

Country	Regional Rank	Indicators											
		EQ1	EQ2	EQ3	GE1	GE2	GE3	BE1	BE2	BE3	CV1	CV2	CV3
Comoros	-	90.32	61.19	91.72	98.26	100.00	88.89	61.89	100.00	16.24	57.42	24.82	6.24
Congo Republic	-	60.37	59.18	87.91	86.16	89.15	79.13	70.58	100.00	46.91	94.83	8.27	100.00
Djibouti	-	55.14	63.03	89.07	98.69	94.86	79.55	1.55	2.48	20.98	71.96	48.61	10.04
DR Congo	-	65.02	59.06	87.03	68.88	93.07	84.28	47.86	100.00	54.35	81.69	1.00	100.00
Equatorial Guinea	-	52.28	81.63	88.47	75.52	1.00	99.61	100.00	100.00	50.54	71.04	17.09	13.95
Eritrea	-	53.92	11.67	88.47	99.03	86.44	59.85	1.00	51.62	17.75	81.95	47.46	17.27
Eswatini	-	81.95	17.42	88.47	96.37	78.38	74.24	15.96	100.00	18.56	70.83	-	32.23
Guinea-Bissau	-	40.40	35.74	88.40	96.23	94.73	67.57	55.53	100.00	20.40	85.74	23.93	99.08
Liberia	-	45.09	15.44	88.60	86.56	63.97	96.91	38.13	100.00	48.43	86.66	19.77	9.88
Sao Tome and Principe	-	71.52	86.28	90.53	92.55	95.61	98.59	86.39	100.00	38.53	67.85	62.27	2.79
Somalia	-	72.46	1.00	88.47	95.32	95.12	58.87	1.00	55.80	24.67	85.24	47.65	1.00
South Sudan	-	62.74	1.00	82.94	94.52	82.15	1.00	44.49	66.96	-	88.78	-	100.00
Reunion	-	-	-	-	-	-	-	71.83	-	29.87	32.09	-	-
Mayotte	-	-	-	-	-	-	-	80.53	-	-	74.84	53.88	-
St. Helena	-	-	-	-	-	-	-	39.62	-	-	43.91	35.24	-
French Southern Territories	-	-	-	-	-	-	-	92.36	-	-	74.01	-	-
British Indian Ocean Territory	-	-	-	-	-	-	-	99.97	-	-	71.43	42.07	-
Western Sahara	-	-	-	-	-	-	-	-	-	10.21	95.27	29.67	-
THE AMERICAS													
United States	1	100.00	99.90	42.00	39.82	50.19	63.90	34.47	100.00	22.86	74.06	44.80	100.00
Paraguay	2	96.59	97.36	80.50	60.76	59.42	1.00	47.87	100.00	17.13	92.39	-	100.00
Brazil	3	97.76	97.64	72.96	81.72	88.21	27.10	49.78	100.00	40.70	82.03	26.71	100.00
Chile	4	82.73	99.61	72.39	93.54	85.10	83.02	38.06	100.00	51.64	63.53	32.08	100.00
Uruguay	5	100.00	99.15	73.82	93.56	76.26	1.00	35.77	69.28	23.40	86.09	79.71	18.91
Costa Rica	6	89.96	98.09	78.14	100.00	83.36	75.66	44.76	100.00	46.26	75.92	55.27	36.51
Panama	7	95.67	94.23	73.56	84.79	75.26	74.46	60.12	100.00	34.51	56.41	63.58	100.00
Canada	8	100.00	99.87	49.56	26.04	38.69	49.14	33.07	100.00	21.88	94.94	50.66	84.46
Jamaica	9	92.85	96.06	73.98	90.14	92.83	93.71	33.17	100.00	37.60	45.20	81.48	11.35
Mexico	10	86.31	97.22	69.92	84.99	78.56	75.87	46.18	100.00	13.11	50.52	95.03	100.00
El Salvador	11	83.33	94.71	80.96	94.22	88.63	87.98	49.20	100.00	27.24	70.37	26.30	16.61
Bolivia	12	77.23	93.06	85.29	65.21	86.48	24.14	50.81	100.00	31.31	76.99	-	100.00
Venezuela	13	84.11	93.09	76.69	80.81	50.81	56.66	78.13	100.00	48.28	70.91	16.59	100.00
Suriname	14	84.88	89.32	89.41	4.53	56.92	65.75	52.91	100.00	84.80	98.88	12.98	63.21
Colombia	15	83.76	97.55	81.36	85.20	80.64	61.74	57.97	100.00	43.52	59.23	19.34	100.00
Nicaragua	16	85.88	93.87	81.03	83.07	91.07	48.57	65.17	100.00	22.02	72.80	29.65	74.06
Argentina	17	95.25	99.16	70.28	80.22	68.07	11.02	38.98	61.57	43.89	77.87	28.36	69.92
Dominican Republic	18	89.55	89.13	72.48	90.98	90.39	74.00	83.94	100.00	20.10	58.18	38.24	100.00
Ecuador	19	86.51	98.35	76.62	83.58	81.18	78.16	43.65	100.00	41.88	47.53	23.56	100.00
Peru	20	71.83	97.05	80.79	80.91	89.49	76.13	35.27	100.00	55.91	59.08	20.34	100.00
Guatemala	21	76.13	73.51	87.96	94.61	90.69	81.33	40.51	100.00	29.65	56.10	16.16	75.12

Table 18. Normalized values of green growth indicators for natural capital protection *(continued)*

Country	Regional Rank	Indicators											
		EQ1	EQ2	EQ3	GE1	GE2	GE3	BE1	BE2	BE3	CV1	CV2	CV3
Honduras	22	82.59	86.56	83.12	93.65	87.48	77.53	73.27	100.00	25.41	60.44	32.86	81.62
Guyana	23	86.34	88.54	82.92	3.99	90.11	12.48	100.00	100.00	100.00	80.97	27.27	38.87
Belize	24	84.88	94.26	79.91	27.14	67.96	68.62	44.77	100.00	49.73	66.49	99.64	100.00
Trinidad and Tobago	25	83.81	97.35	60.88	49.99	18.36	93.86	22.18	100.00	21.82	79.58	27.90	15.77
Barbados	26	84.66	97.44	55.52	81.46	1.00	94.47	3.28	86.32	-	78.92	93.49	1.06
Antigua and Barbuda	-	89.73	96.96	77.48	75.55	1.00	93.29	17.26	100.00	49.50	83.19	93.27	3.80
Bahamas	-	92.44	98.14	51.26	70.67	78.40	97.70	20.79	100.00	10.19	53.45	100.00	63.74
Cuba	-	89.55	96.83	83.05	91.26	87.11	70.44	73.54	100.00	27.23	49.88	17.58	50.48
Dominica	-	88.36	95.63	87.08	90.45	90.79	82.92	17.50	100.00	-	51.80	75.22	5.42
Grenada	-	84.47	95.78	80.06	87.85	1.00	94.98	43.06	100.00	26.26	40.66	100.00	2.69
Haiti	-	87.78	3.36	84.86	98.96	96.62	87.78	44.14	73.73	22.83	57.38	9.94	21.28
Puerto Rico	-	100.00	97.12	14.17	-	-	-	41.70	100.00	19.60	50.62	-	16.32
St. Kitts and Nevis	-	100.00	94.26	56.74	76.68	46.74	93.47	54.73	100.00	49.50	15.31	100.00	33.74
St. Lucia	-	84.82	95.83	68.76	91.01	57.98	93.08	45.49	100.00	68.90	65.22	100.00	7.83
St. Vincent and the Grenadines	-	84.95	95.31	79.47	90.19	86.51	94.03	49.03	100.00	51.61	60.08	95.40	4.42
Bermuda	-	100.00	97.71	9.55	-	-	-	28.70	100.00	-	38.31	100.00	1.00
Greenland	-	100.00	99.89	37.22	-	-	-	30.53	1.00	-	85.28	41.66	100.00
United States Virgin Islands	-	100.00	97.93	1.00	-	-	-	42.41	100.00	13.12	71.32	-	8.27
Aruba	-	-	-	38.98	-	-	-	31.23	14.59	-	96.14	100.00	2.04
Cayman Islands	-	-	-	27.54	-	-	-	55.05	100.00	-	71.84	96.20	1.76
Curacao	-	-	-	88.61	-	-	-	45.35	1.92	19.24	83.17	100.00	2.96
British Virgin Islands	-	-	-	26.97	-	-	-	7.65	100.00	49.50	64.16	100.00	1.18
Saint-Martin	-	-	-	64.32	-	-	-	74.50	100.00	29.75	88.83	97.62	100.00
Sint Maarten	-	-	-	-	-	-	-	6.68	64.37	-	97.64	100.00	60.80
Turks and Caicos Islands	-	-	-	-	-	-	-	28.46	65.49	31.54	77.87	99.41	3.84
French Guiana	-	-	-	-	-	-	-	79.24	-	85.29	91.43	30.31	-
Guadeloupe	-	-	-	-	-	-	-	89.23	-	81.14	35.26	-	-
Martinique	-	-	-	-	-	-	-	98.34	-	71.67	53.22	-	-
Anguilla	-	-	-	-	-	-	-	14.80	-	49.50	84.20	100.00	-
Falkland Islands	-	-	-	-	-	-	-	20.36	-	1.00	59.37	46.57	-
St. Pierre and Miquelon	-	-	-	-	-	-	-	2.63	-	7.06	80.70	46.59	-
St. Barths	-	-	-	-	-	-	-	64.07	-	29.75	96.25	-	-
Montserrat	-	-	-	-	-	-	-	29.24	-	-	38.74	100.00	-
Bonaire, Saint Eustatius and Saba	-	-	-	-	-	-	-	68.32	-	-	82.69	-	-
Bouvet Island	-	-	-	-	-	-	-	100.00	-	-	90.11	-	-
South Georgia and South Sandwich Is.	-	-	-	-	-	-	-	22.94	-	-	91.26	-	-

Table 18. Normalized values of green growth indicators for natural capital protection *(continued)*

Country	Regional Rank	Indicators											
		EQ1	EQ2	EQ3	GE1	GE2	GE3	BE1	BE2	BE3	CV1	CV2	CV3
ASIA													
Japan	1	95.31	99.39	75.94	61.94	89.27	94.66	66.04	100.00	27.10	62.04	23.96	100.00
Laos	2	85.74	76.06	96.32	81.90	98.38	56.56	45.85	100.00	29.06	72.71	-	100.00
Georgia	3	89.38	99.46	84.70	86.93	64.20	82.15	40.63	100.00	28.56	89.13	78.32	53.54
China	4	49.05	99.49	79.91	64.40	76.14	85.11	10.55	100.00	15.95	58.57	44.80	100.00
Thailand	5	76.46	90.02	72.11	81.29	68.64	69.58	58.92	100.00	33.91	63.99	70.35	98.53
Bhutan	6	59.02	88.60	88.50	99.93	82.63	78.67	43.49	100.00	63.20	72.16	-	100.00
Malaysia	7	91.09	95.09	69.37	54.45	60.06	85.42	35.02	100.00	49.47	53.78	58.98	65.87
Philippines	8	88.06	87.78	89.97	94.63	94.89	83.06	47.73	100.00	51.75	49.87	100.00	28.30
Vietnam	9	85.95	96.46	92.22	83.04	88.68	77.06	38.01	100.00	15.48	55.35	40.72	22.48
Cyprus	10	92.46	99.77	54.16	74.57	81.50	89.44	63.24	100.00	10.68	87.17	60.79	82.85
Indonesia	11	87.33	77.63	82.23	81.34	83.67	71.64	30.24	100.00	42.33	63.28	35.96	39.64
Maldives	12	98.72	93.63	63.11	86.83	78.43	100.00	1.00	16.92	32.18	75.32	99.75	1.50
Armenia	13	68.01	99.64	87.97	88.51	82.13	80.36	26.24	68.15	19.64	75.21	-	100.00
South Korea	14	76.41	99.75	71.74	50.38	64.17	91.46	33.99	100.00	31.41	50.49	12.94	43.99
Kyrgyz Republic	15	80.97	97.70	86.73	96.32	94.87	74.64	30.86	41.49	12.47	82.53	-	50.17
Israel	16	86.80	99.82	53.99	69.38	33.19	94.63	21.68	38.68	2.78	56.87	16.82	78.29
Azerbaijan	17	79.04	95.90	78.37	84.75	1.00	77.15	36.20	81.56	-	90.77	-	41.47
Kazakhstan	18	86.08	99.31	80.24	46.02	62.48	58.19	32.13	8.52	20.05	82.02	-	87.07
Nepal	19	1.13	82.00	95.73	97.85	90.13	73.64	50.09	100.00	41.83	76.05	-	100.00
United Arab Emirates	20	54.47	99.22	58.96	1.00	1.00	93.18	44.54	27.02	18.19	76.47	57.91	100.00
Brunei Darussalam	21	100.00	99.80	63.53	1.00	1.00	91.56	42.24	100.00	58.04	76.87	20.30	66.92
Singapore	22	88.14	99.89	76.64	62.32	12.52	99.89	13.08	100.00	32.34	75.48	55.30	19.07
Cambodia	23	83.62	88.77	95.00	86.30	93.59	54.66	61.50	100.00	17.00	68.65	100.00	100.00
Tajikistan	24	61.70	67.87	84.46	95.91	97.58	79.25	22.15	18.82	-	98.26	-	100.00
Qatar	25	10.67	99.47	66.15	1.00	11.74	96.21	60.39	1.00	1.00	72.99	55.92	43.86
Myanmar	26	73.72	82.97	92.84	88.06	97.26	50.01	27.15	100.00	29.99	68.34	20.31	29.87
Mongolia	27	62.05	97.85	31.55	35.46	82.39	1.00	45.54	53.99	13.68	92.84	-	100.00
Sri Lanka	28	86.52	94.93	91.22	95.04	92.29	91.76	42.58	100.00	19.28	32.36	52.65	25.78
Bangladesh	29	27.74	78.27	93.31	97.57	97.24	83.60	21.02	85.26	15.51	60.33	11.22	36.85
Timor-Leste	30	92.36	75.18	96.50	97.19	9.27	77.63	39.27	100.00	35.64	76.67	52.41	39.05
India	31	1.00	62.04	90.06	92.93	97.40	83.88	8.14	100.00	16.87	49.87	51.58	33.23
Palestine	32	71.19	98.48	75.57	-	-	-	1.00	10.80	-	84.43	-	62.30
Jordan	33	72.08	98.53	78.58	91.45	78.64	96.73	15.19	7.39	14.14	93.93	55.03	33.80
Oman	34	53.24	98.38	52.12	23.78	60.65	88.11	21.91	1.05	25.87	81.86	41.97	12.13
Lebanon	35	74.36	96.79	74.05	81.77	74.38	95.57	7.81	82.93	15.15	94.01	47.72	6.91
Saudi Arabia	36	30.34	98.43	63.53	29.81	16.27	94.53	24.58	3.65	7.15	84.54	38.09	34.21
Afghanistan	37	42.63	56.73	88.48	99.52	50.74	88.37	51.52	11.79	-	88.23	-	27.67
Iran	38	62.11	98.79	84.16	65.68	51.87	88.35	48.17	39.64	32.79	79.37	13.40	57.22
Kuwait	39	31.07	99.36	58.33	1.00	1.00	96.24	42.44	3.04	-	79.68	15.70	79.59
Uzbekistan	40	66.48	99.31	90.49	84.48	35.36	67.54	25.62	50.10	12.13	95.38	-	43.30
Iraq	41	47.97	96.85	74.06	81.70	89.28	94.65	5.16	12.07	12.80	68.27	11.85	12.23

Table 18. Normalized values of green growth indicators for natural capital protection *(continued)*

Country	Regional Rank	Indicators											
		EQ1	EQ2	EQ3	GE1	GE2	GE3	BE1	BE2	BE3	CV1	CV2	CV3
Pakistan	42	28.89	64.62	88.71	96.44	97.36	74.67	30.82	28.83	18.39	74.04	14.40	72.83
Bahrain	43	33.44	99.03	52.30	1.00	1.00	98.95	1.00	6.31	-	59.73	39.86	13.37
Yemen	44	53.38	85.26	87.55	99.12	98.11	92.17	25.28	7.06	4.23	79.44	3.02	5.44
Turkmenistan	-	78.09	97.55	93.43	50.27	1.00	54.33	14.86	52.14	1.98	96.15	-	24.56
North Korea	-	53.57	97.47	-	89.94	82.48	93.97	1.00	100.00	15.39	84.85	22.03	10.24
Syria	-	71.66	98.45	84.64	94.67	86.68	90.44	1.00	17.56	12.54	92.65	9.74	5.86
Turkey	-	78.32	98.08	69.76	78.52	89.28	81.88	-	100.00	-	-	19.24	42.60
Hong Kong	-	-	-	44.47	-	-	-	39.37	-	-	82.51	-	100.00
Macau	-	-	-	55.92	-	-	-	1.00	-	-	72.82	-	-
Taiwan	-	-	98.79	77.70	-	-	-	-	-	-	-	26.06	-
EUROPE													
Switzerland	1	100.00	99.90	49.37	81.63	92.45	80.08	44.64	100.00	45.58	94.61	-	90.03
Denmark	2	100.00	99.78	39.70	75.46	91.33	45.52	91.13	92.63	27.12	97.00	26.06	100.00
Austria	3	97.07	99.90	58.02	71.57	88.71	74.14	68.52	100.00	40.79	80.45	-	100.00
Germany	4	97.56	99.89	56.52	65.19	89.50	78.14	80.32	100.00	43.76	96.16	93.50	100.00
Czech republic	5	90.87	99.04	64.32	61.83	68.02	80.42	94.99	100.00	38.70	95.07	-	100.00
Sweden	6	100.00	99.79	67.97	90.11	93.81	78.57	64.57	100.00	17.74	98.81	40.32	100.00
Slovakia	7	88.69	99.83	69.97	75.08	80.49	85.40	87.84	100.00	40.52	95.04	-	100.00
Finland	8	100.00	99.93	59.60	55.39	81.63	66.59	76.63	100.00	14.80	98.55	23.50	97.30
United Kingdom	9	99.87	99.94	66.97	76.77	84.92	76.42	85.08	78.00	27.56	95.84	64.70	100.00
Belarus	10	91.31	99.60	67.83	71.93	78.12	31.50	89.13	100.00	37.05	96.18	-	100.00
Italy	11	91.77	99.87	64.39	77.94	82.49	83.03	79.11	100.00	26.54	79.87	83.85	100.00
Hungary	12	91.22	99.08	72.41	76.77	83.41	75.03	84.18	100.00	26.29	86.30	-	100.00
France	13	98.10	99.76	60.89	85.42	86.24	65.98	82.31	100.00	32.29	76.35	64.50	100.00
Netherlands	14	97.24	99.82	63.75	61.77	88.23	66.89	87.15	65.07	13.73	86.12	65.30	100.00
Estonia	15	100.00	99.66	73.69	56.82	86.39	56.87	95.21	100.00	27.76	97.67	42.08	100.00
Slovenia	16	90.57	99.75	64.03	70.54	83.03	76.18	75.23	100.00	59.45	86.41	41.43	100.00
Norway	17	100.00	99.84	44.57	80.84	78.01	70.28	61.49	100.00	15.82	92.19	64.85	100.00
Lithuania	18	99.49	99.49	66.32	72.20	79.77	45.23	90.26	100.00	31.92	98.44	17.09	100.00
Portugal	19	100.00	99.84	63.39	81.78	76.13	78.72	74.41	100.00	10.45	84.01	97.12	100.00
Croatia	20	88.55	99.57	68.26	85.99	79.80	77.50	85.31	100.00	41.19	82.49	100.00	100.00
Latvia	21	97.28	99.72	68.69	81.95	83.18	54.92	96.99	100.00	30.59	98.20	33.15	100.00
Luxembourg	22	99.91	99.89	43.50	41.29	91.24	68.09	61.32	100.00	42.73	96.97	-	100.00
Albania	23	88.32	99.30	72.84	93.31	87.27	67.21	63.57	100.00	-	85.55	62.56	100.00
Spain	24	100.00	99.85	66.04	80.81	86.50	72.78	63.65	100.00	13.90	78.50	68.79	100.00
Poland	25	82.90	99.34	76.06	66.12	70.57	73.48	90.63	100.00	39.34	96.17	20.16	100.00
Belgium	26	96.39	99.76	70.40	63.85	88.23	74.65	70.91	100.00	40.79	96.73	26.26	100.00
Romania	27	92.33	98.99	80.06	88.69	76.08	74.49	76.76	100.00	48.92	82.16	23.06	100.00
Bulgaria	28	87.33	99.35	70.98	100.00	75.24	76.25	99.28	100.00	42.68	90.50	26.90	100.00
Bosnia and Herzegovina	29	73.67	99.60	74.83	70.87	84.58	75.14	55.24	100.00	37.11	82.60	22.20	30.79
Macedonia	30	72.59	99.29	78.56	82.34	76.17	77.37	50.36	100.00	17.54	88.43	-	85.50
Serbia	31	79.23	99.67	75.91	67.21	58.32	74.02	33.41	100.00	37.25	87.63	-	57.07
Greece	32	94.25	99.94	62.60	76.24	73.04	76.86	87.40	100.00	8.91	79.05	100.00	81.87

Table 18. Normalized values of green growth indicators for natural capital protection *(continued)*

Country	Regional Rank	Indicators											
		EQ1	EQ2	EQ3	GE1	GE2	GE3	BE1	BE2	BE3	CV1	CV2	CV3
Russia	33	97.84	99.60	70.12	63.54	1.00	77.81	29.01	100.00	18.86	91.61	11.37	63.88
Moldova	34	94.93	99.25	19.94	83.91	72.92	79.49	85.62	69.27	22.56	95.52	-	84.82
Ukraine	35	93.87	99.54	75.86	82.29	66.49	78.55	63.61	98.45	33.33	90.15	8.80	91.04
Ireland	36	100.00	99.91	57.31	59.82	87.80	1.00	82.87	67.45	26.78	80.87	24.27	30.64
Iceland	37	100.00	99.91	53.16	72.85	60.46	45.14	28.79	4.00	6.46	81.81	87.64	21.99
Malta	38	95.95	99.90	50.44	85.19	81.29	94.57	94.91	9.37	-	88.00	100.00	56.58
Montenegro	39	84.78	99.90	62.17	80.24	64.41	79.39	34.44	100.00	23.37	75.23	51.75	68.51
Andorra	-	100.00	99.95	62.77	72.77	62.32	100.00	26.94	100.00	36.56	93.02	-	100.00
Liechtenstein	-	-	-	36.69	82.78	88.08	-	80.99	100.00	56.98	97.06	-	100.00
Monaco	-	97.74	99.95	12.98	-	-	-	-	1.00	1.00	81.72	71.19	100.00
San Marino	-	100.00	99.95	63.09	-	-	-	-	98.06	22.01	75.19	-	-
Faeroe Islands	-	-	-	10.73	-	-	-	17.07	1.34	-	80.70	40.27	1.17
Gibraltar	-	-	-	64.02	-	-	-	1.00	1.00	1.00	88.60	91.95	1.00
Guernsey	-	-	-	-	-	-	-	11.91	-	-	91.50	42.05	-
Isle of Man	-	-	-	55.31	-	-	-	20.21	36.35	-	94.29	-	100.00
Jersey	-	-	-	-	-	-	-	64.45	-	-	92.94	42.78	-
Svalbard and Jan Mayen Islands	-	-	-	-	-	-	-	83.00	-	1.00	84.61	-	-
Vatican	-	-	-	-	-	-	-	-	-	1.00	71.99	-	-
Aland Islands	-	-	-	-	-	-	-	-	-	-	99.62	-	-
Kosovo	-	-	-	87.43	-	-	-	-	-	-	-	-	-
OCEANIA													
New Zealand	1	100.00	99.65	48.18	78.26	66.55	1.00	38.49	100.00	69.05	44.69	100.00	100.00
Fiji	2	98.66	83.39	84.47	-	85.65	87.49	9.25	100.00	47.83	52.74	100.00	8.26
Australia	3	100.00	99.88	59.96	26.37	30.97	1.00	57.69	100.00	20.39	72.44	58.31	100.00
Papua New Guinea	4	91.57	32.33	90.87	81.14	73.00	84.52	6.47	100.00	41.64	73.50	4.18	6.25
Marshall Islands	-	100.00	87.20	88.42	87.64	70.38	100.00	9.89	100.00	31.51	72.80	60.37	2.98
Nauru	-	100.00	88.49	66.15	85.11	100.00	100.00	1.00	1.00	1.00	70.88	62.18	1.00
Palau	-	100.00	85.10	68.73	56.69	58.06	100.00	60.55	100.00	97.12	51.53	67.33	100.00
Samoa	-	98.63	95.50	89.65	93.55	81.02	71.24	46.16	100.00	25.25	62.81	78.38	3.32
Solomon Islands	-	96.08	82.76	77.25	1.00	83.21	96.43	3.80	100.00	23.12	63.27	37.79	2.10
Tonga	-	99.21	93.51	88.35	95.00	84.20	76.38	15.93	73.39	45.90	57.36	74.43	1.53
Micronesia, Fed. Sts.	-	99.48	89.41	82.34	97.55	96.89	80.62	1.54	100.00	100.00	47.71	-	1.12
Kiribati	-	100.00	54.92	77.75	98.31	97.44	97.56	37.10	9.48	-	61.18	-	87.67
Vanuatu	-	96.10	80.35	81.52	98.75	83.28	52.54	4.28	100.00	-	49.27	99.89	1.67
Tuvalu	-	100.00	87.72	74.37	96.28	100.00	72.64	-	100.00	-	73.78	73.52	1.22
American Samoa	-	100.00	88.97	75.66	-	-	-	77.31	100.00	35.82	79.82	74.86	65.00
Guam	-	100.00	93.87	36.81	-	-	-	3.91	100.00	26.86	1.00	-	1.24
Northern Mariana Islands	-	100.00	91.38	56.71	-	-	-	35.31	100.00	-	35.33	-	100.00
New Caledonia	-	-	-	72.26	-	-	-	44.63	100.00	34.72	43.80	92.26	100.00

Table 18. Normalized values of green growth indicators for natural capital protection *(continued)*

Country	Regional Rank	Indicators											
		EQ1	EQ2	EQ3	GE1	GE2	GE3	BE1	BE2	BE3	CV1	CV2	CV3
French Polynesia	-	-	-	61.64	-	-	-	1.01	100.00	35.39	54.08	82.25	1.32
Niue	-	-	86.38	-	-	-	-	95.32	-	26.88	70.48	77.76	-
Cook Islands	-	-	94.56	-	-	-	-	27.71	-	-	67.73	82.24	-
Tokelau	-	-	69.76	-	-	-	-	1.00	-	1.00	76.76	76.49	-
Wallis and Futuna Islands	-	-	-	-	-	-	-	1.00	-	45.48	75.51	78.12	-
Christmas Island	-	-	-	-	-	-	-	63.26	-	-	15.98	87.14	-
Cocos (Keeling) Islands	-	-	-	-	-	-	-	100.00	-	-	64.28	87.59	-
Norfolk Island	-	-	-	-	-	-	-	42.15	-	-	51.80	86.84	-
Pitcairn	-	-	-	-	-	-	-	57.60	-	-	55.56	79.12	-
Heard and McDonald Islands	-	-	-	-	-	-	-	100.00	-	-	88.45	-	-
United States Minor Outlying Islands	-	-	-	-	-	-	-	93.70	-	-	75.44	-	-

Definitions:
EQ1: $PM_{2.5}$ air pollution, mean annual population-weighted exposure (Micrograms per m^3)
EQ2: DALY rate due to unsafe water sources (DALY lost per 100,000 persons)
EQ3: Municipal solid waste (MSW) generation per capita (Ton per year per capita)
GE1: Ratio of CO_2 emissions to population, including AFOLU (Metric tons per capita)
GE2: Ratio of non-CO_2 emissions to population, excluding AFOLU (Ton per capita)
GE3: Ratio of non-CO_2 emissions in agriculture to population (Gigagrams per 1000 persons)
BE1: Average proportion of Key Biodiversity Areas covered by protected areas (Percent)
BE2: Forest area (Percent)
BE3: Above-ground biomass in forest (tonnes per hectare)
CV1: Red List Index Reporting (Index)
CV2: Tourism and recreation in coastal and marine areas (Score)
CV3: Terrestrial and marine protected areas (Percent)

Table 19. Normalized values of green growth indicators for green economic opportunities

Country	Regional Rank	Indicators											
		GV1	GV2	GV3	GT1	GT2	GT3	GJ1	GJ2	GJ3	GN1	GN2	GN3
AFRICA													
Gabon	1	74.57	29.82	-	4.75	-	100.00	-	1.03	98.52	32.13	22.39	10.61
Mauritius	2	55.34	74.09	9.75	6.39	92.49	100.00	10.29	-	99.95	26.78	37.74	13.77
Seychelles	3	-	34.97	27.11	2.24	-	100.00	-	-	-	36.38	24.40	13.31
Togo	4	72.41	26.39	17.18	40.32	60.85	100.00	-	-	44.48	76.51	-	1.96
Cabo Verde	5	88.44	62.42	13.21	1.49	-	-	26.04	-	96.95	38.92	38.24	5.06
Namibia	6	52.78	55.05	18.56	6.31	73.09	100.00	-	1.47	-	6.61	39.75	14.39
Cote d'Ivoire	7	81.82	34.97	-	3.31	93.72	-	-	-	59.71	20.82	40.01	3.19
Gambia	8	80.20	24.68	4.31	1.29	-	100.00	3.20	-	-	100.00	14.34	1.08
Burkina Faso	9	65.95	51.62	7.82	1.48	98.44	100.00	-	-	53.90	100.00	36.99	1.29
Zambia	10	86.62	42.35	10.26	2.25	100.00	100.00	33.51	2.39	29.22	100.00	39.50	10.87
Guinea	11	32.64	26.74	10.57	3.26	95.24	100.00	-	-	65.30	100.00	83.79	5.15
Tanzania	12	90.42	42.18	-	3.57	92.75	-	18.27	1.07	27.82	49.10	45.29	1.72
Cameroon	13	53.09	36.17	6.75	2.55	98.55	99.99	19.98	-	71.80	7.75	39.25	3.05
South Africa	14	51.80	54.02	14.23	19.34	100.00	99.85	27.19	2.61	91.15	6.66	67.44	12.60
Benin	15	68.45	54.19	1.79	1.59	97.95	100.00	-	-	42.40	53.23	28.68	1.01
Uganda	16	49.19	47.33	6.06	3.68	92.85	100.00	35.92	1.81	-	9.73	47.56	2.76
Botswana	17	67.18	65.86	9.62	1.95	84.00	100.00	8.78	1.01	-	12.74	39.75	1.15
Lesotho	18	63.39	25.54	14.04	30.99	-	100.00	1.03	-	-	100.00	35.73	3.22
Senegal	19	76.65	38.75	12.26	2.77	94.10	100.00	20.68	1.01	-	37.61	46.80	2.68
Zimbabwe	20	57.36	52.99	12.49	2.97	97.61	100.00	12.97	1.00	55.08	38.92	21.13	6.11
Malawi	21	-	43.21	6.83	3.89	89.79	100.00	22.41	-	-	-	25.41	2.79
Kenya	22	65.30	40.63	6.75	7.61	93.30	100.00	25.82	1.40	-	4.07	65.42	4.03
Burundi	23	27.80	32.91	11.54	4.58	-	100.00	42.75	-	12.48	100.00	33.46	1.30
Ethiopia	24	74.07	37.03	3.14	1.20	96.37	99.99	30.55	1.71	-	30.59	48.81	3.67
Mali	25	60.05	34.46	11.05	1.99	-	100.00	-	-	-	6.14	40.76	2.40
Rwanda	26	53.25	50.41	18.07	9.89	92.02	100.00	2.00	1.12	-	100.00	46.05	1.79
Mozambique	27	45.61	32.91	23.21	1.54	82.32	100.00	-	1.07	-	16.71	38.50	5.78
Ghana	28	60.60	57.62	8.81	3.07	96.47	100.00	7.38	2.42	-	18.00	44.54	4.49
Morocco	29	85.27	64.14	19.97	7.98	99.13	99.99	5.68	4.02	-	6.84	32.96	7.42
Tunisia	30	53.45	67.92	49.06	25.37	100.00	100.00	52.76	1.75	-	3.70	31.95	3.23
Sierra Leone	31	41.88	19.53	11.91	13.41	-	100.00	-	-	63.79	41.83	27.17	1.79
Mauritania	32	89.14	44.75	10.11	2.08	-	100.00	-	-	94.76	100.00	24.66	2.78
Nigeria	33	81.06	38.06	7.05	1.41	99.90	100.00	20.20	1.18	-	2.24	20.63	1.67
Central African Republic	34	-	24.33	3.91	5.22	-	100.00	-	-	23.02	100.00	-	1.23
Algeria	35	76.80	61.22	15.77	3.84	-	99.98	60.46	18.24	-	3.95	23.15	2.04
Angola	36	74.01	47.33	10.60	1.59	-	100.00	11.95	1.68	-	20.82	7.79	8.43
Madagascar	37	50.79	10.09	9.88	2.00	92.81	100.00	9.78	-	1.00	49.10	41.26	1.45
Egypt	38	53.76	65.86	5.67	16.99	98.63	99.79	34.30	1.34	99.66	4.57	26.42	4.85
Niger	39	68.77	26.74	4.52	1.88	-	100.00	1.00	-	34.34	8.38	-	1.06
Sudan	40	43.49	22.62	10.85	1.16	-	99.99	-	-	85.50	49.10	-	3.68
Libya	41	17.42	60.71	4.01	4.74	-	100.00	-	1.41	-	32.13	1.00	1.06
Comoros	-	62.88	3.06	1.00	1.49	-	100.00	-	-	81.55	-	-	1.11

Table 19. Normalized values of green growth indicators for green economic opportunities *(continued)*

Country	Regional Rank	Indicators											
		GV1	GV2	GV3	GT1	GT2	GT3	GJ1	GJ2	GJ3	GN1	GN2	GN3
Congo Republic	-	8.69	38.06	-	6.95	-	-	-	-	40.00	38.92	-	3.62
Djibouti	-	65.04	9.24	-	1.66	-	-	-	-	-	23.65	-	2.24
Eswatini	-	61.84	42.18	15.83	7.40	-	-	21.42	-	-	36.38	9.05	11.15
DR Congo	-	39.74	26.74	-	1.11	-	-	-	1.12	-	-	27.93	2.93
Guinea-Bissau	-	50.19	12.32	-	1.00	-	100.00	-	-	22.47	-	-	1.03
Chad	-	-	23.31	-	-	-	100.00	-	-	54.15	100.00	21.38	1.01
Eritrea	-	-	19.53	-	6.83	-	100.00	34.41	-	-	100.00	-	1.46
Liberia	-	-	10.95	-	-	-	100.00	-	-	62.50	32.13	34.47	2.22
Sao Tome and Principe	-	-	21.93	9.20	1.91	-	-	-	-	-	100.00	-	1.80
Somalia	-	-	21.59	-	-	-	100.00	-	-	-	100.00	-	1.10
Equatorial Guinea	-	-	23.65	-	-	-	-	-	-	-	100.00	-	6.26
South Sudan	-	37.32	27.77	-	-	-	-	1.27	-	-	-	-	1.00
Reunion	-	-	-	-	-	-	-	-	-	-	8.38	-	32.80
THE AMERICAS													
United States	1	61.33	68.94	-	31.91	98.02	-	75.70	4.02	-	6.09	100.00	-
Paraguay	2	79.92	21.07	9.59	6.41	89.96	99.97	40.20	2.09	99.75	53.73	21.89	90.09
Brazil	3	54.99	43.21	5.36	10.39	100.00	98.77	25.39	6.39	96.60	9.44	43.28	51.46
Chile	4	50.12	27.08	11.77	7.22	98.85	99.95	43.24	3.17	99.72	15.76	45.79	52.65
Uruguay	5	74.72	19.19	2.38	2.80	91.05	99.94	12.24	2.72	99.96	1.26	40.26	74.83
Costa Rica	6	78.91	44.41	15.05	9.32	88.91	99.86	25.06	1.26	99.53	3.79	48.06	42.83
Panama	7	82.39	31.88	14.08	3.40	93.78	99.99	12.12	1.93	99.58	11.19	40.51	40.69
Canada	8	65.90	73.06	19.39	19.36	100.00	32.10	74.63	1.63	-	8.21	72.97	-
Jamaica	9	98.26	29.82	14.43	12.24	98.90	100.00	38.49	-	99.56	13.47	45.79	7.06
Mexico	10	60.14	28.62	39.98	29.95	98.53	99.65	52.80	3.30	97.71	8.29	48.06	17.02
El Salvador	11	63.13	22.10	20.20	15.69	94.83	100.00	-	1.03	97.65	59.28	25.16	18.05
Bolivia	12	52.49	45.61	-	4.11	99.56	-	3.92	-	97.09	23.65	18.36	7.96
Venezuela	13	-	-	-	4.11	100.00	-	-	2.28	93.98	13.86	32.96	40.80
Suriname	14	88.93	11.29	22.87	4.32	-	100.00	-	-	-	100.00	29.19	22.08
Colombia	15	57.57	39.09	4.54	6.03	98.22	99.88	35.38	12.56	94.96	3.33	47.56	17.47
Nicaragua	16	72.14	18.67	21.57	3.05	95.29	100.00	-	2.89	96.51	23.65	24.66	8.24
Argentina	17	71.52	47.50	5.50	9.59	100.00	78.74	26.97	3.70	99.65	2.83	40.01	23.44
Dominican Republic	18	85.40	19.53	14.47	11.18	95.01	99.99	23.45	1.13	99.23	4.19	27.17	10.31
Ecuador	19	58.62	19.53	5.20	5.08	96.91	98.80	51.60	2.59	94.68	6.03	33.71	21.13
Peru	20	64.36	30.68	7.08	4.66	97.26	99.99	26.64	1.88	95.75	10.82	30.69	13.89
Guatemala	21	67.32	20.39	10.53	12.74	95.81	99.94	1.05	-	93.13	20.02	43.03	12.02
Honduras	22	82.31	20.90	14.03	3.76	100.00	99.99	-	-	87.19	10.93	33.71	13.26
Guyana	23	58.15	20.73	23.43	2.55	-	100.00	-	-	-	6.57	51.83	5.46
Belize	24	72.05	8.38	12.98	1.68	-	100.00	-	-	-	7.46	18.87	18.38
Trinidad and Tobago	25	-	27.77	100.00	100.00	100.00	100.00	7.71	-	-	33.10	27.17	1.15
Barbados	26	51.50	22.62	17.33	21.42	-	100.00	-	-	-	22.15	40.51	13.02
Bahamas	-	62.05	29.82	9.28	15.01	-	-	19.72	-	-	61.83	-	1.36

Table 19. Normalized values of green growth indicators for green economic opportunities *(continued)*

Country	Regional Rank	Indicators											
		GV1	GV2	GV3	GT1	GT2	GT3	GJ1	GJ2	GJ3	GN1	GN2	GN3
Antigua and Barbuda	-	-	19.53	14.46	-	-	100.00	-	-	-	10.93	-	13.23
Haiti	-	66.46	24.68	-	-	-	100.00	-	-	66.59	38.92	6.03	1.47
Cuba	-	-	77.18	-	17.75	-	100.00	3.10	-	-	8.17	-	8.69
Dominica	-	-	58.65	37.99	4.56	-	-	-	-	-	100.00	-	7.64
Grenada	-	-	40.12	13.06	88.01	-	-	-	-	-	66.07	-	2.99
St. Kitts and Nevis	-	-	19.53	-	15.73	-	-	-	-	-	51.78	-	6.87
St. Lucia	-	-	31.88	-	8.67	-	-	-	-	-	100.00	-	2.50
St. Vincent and the Grenadines	-	-	7.18	-	5.28	-	-	-	-	-	100.00	-	5.86
Aruba	-	-	-	10.61	-	-	-	-	-	-	100.00	-	25.18
Bermuda	-	-	-	2.09	7.49	-	-	4.62	-	-	-	-	-
Turks and Caicos Islands	-	-	-	7.87	-	-	-	-	-	-	-	-	2.40
Greenland	-	-	-	7.09	1.14	-	-	-	-	-	100.00	-	-
Puerto Rico	-	-	-	-	-	-	-	1.00	-	-	8.73	63.91	15.96
Montserrat	-	-	-	-	13.83	-	-	-	-	-	-	-	16.30
Anguilla	-	-	-	-	2.67	-	-	-	-	-	-	-	7.48
British Virgin Islands	-	-	-	-	-	-	-	-	-	-	74.55	-	2.50
French Guiana	-	-	-	-	-	-	-	-	-	-	100.00	-	41.73
Guadeloupe	-	-	-	-	-	-	-	-	-	-	100.00	-	35.03
United States Virgin Islands	-	-	-	-	-	-	-	-	-	-	32.13	-	7.81
Cayman Islands	-	-	-	-	-	-	-	-	-	-	-	-	14.59
Curacao	-	-	-	-	-	-	-	-	-	-	-	-	22.20
Bonaire, Saint Eustatius and Saba	-	-	-	-	-	-	-	-	-	-	-	-	45.79
Falkland Islands	-	-	-	-	-	-	-	-	-	-	-	-	43.93
Saint-Martin	-	-	-	-	-	-	-	-	-	-	-	-	2.05
Martinique	-	-	-	-	-	-	-	-	-	-	-	-	25.14
St. Barths	-	-	-	-	-	-	-	-	-	-	-	-	1.14
ASIA													
Japan	1	60.28	91.59	13.54	55.81	97.18	100.00	46.51	3.55	-	9.74	76.50	-
Laos	2	51.78	59.51	-	31.04	99.00	-	10.12	-	-	22.15	47.56	78.31
Georgia	3	47.53	40.12	25.59	25.30	95.47	100.00	22.59	-	95.61	31.26	26.67	52.55
China	4	78.09	79.24	18.88	39.09	100.00	95.42	47.63	9.05	99.84	13.73	67.69	49.38
Thailand	5	68.19	52.99	45.90	28.57	99.27	100.00	49.35	4.00	99.99	7.74	55.86	12.22
Bhutan	6	73.94	31.88	33.89	4.95	-	100.00	-	-	98.60	35.22	37.74	100.00
Malaysia	7	55.84	55.56	75.32	27.47	100.00	100.00	25.28	19.26	99.99	7.92	87.57	18.91
Philippines	8	66.04	39.78	19.11	15.67	94.82	98.99	29.94	2.87	98.11	6.81	45.79	5.52
Vietnam	9	81.86	50.41	-	17.43	100.00	99.90	29.88	9.78	99.03	10.27	45.29	30.64
Cyprus	10	58.01	91.59	11.11	5.51	100.00	100.00	20.92	4.96	-	13.84	42.77	-
Indonesia	11	70.35	67.92	9.32	9.69	99.76	99.99	24.70	6.29	94.32	-	65.93	3.75
Maldives	12	87.42	43.55	21.95	1.05	-	-	6.30	-	99.87	100.00	-	5.20

Table 19. Normalized values of green growth indicators for green economic opportunities *(continued)*

Country	Regional Rank	Indicators											
		GV1	GV2	GV3	GT1	GT2	GT3	GJ1	GJ2	GJ3	GN1	GN2	GN3
Armenia	13	56.60	44.24	21.31	5.03	98.08	100.00	44.65	-	99.87	6.35	38.50	37.87
South Korea	14	80.02	67.92	-	38.36	97.81	-	74.47	4.88	100.00	13.95	68.44	32.78
Kyrgyz Republic	15	51.64	23.48	-	5.97	83.25	100.00	10.96	1.95	98.49	40.32	20.88	39.15
Israel	16	82.09	94.68	15.25	35.95	92.29	100.00	26.13	8.87	-	3.35	100.00	-
Azerbaijan	17	68.27	60.71	16.72	2.96	99.75	99.99	51.02	12.91	99.87	13.66	64.16	9.55
Kazakhstan	18	55.05	43.21	25.94	2.70	100.00	84.43	22.41	2.54	100.00	15.51	41.52	25.95
Nepal	19	89.36	31.54	13.70	1.18	83.70	100.00	28.66	1.04	-	2.57	26.92	5.70
United Arab Emirates	20	-	96.74	42.65	12.36	99.70	-	66.83	7.06	100.00	21.12	69.70	19.61
Brunei Darussalam	21	88.76	60.71	33.75	9.25	100.00	100.00	31.74	-	-	16.71	39.00	1.72
Singapore	22	99.30	100.00	100.00	24.65	64.07	100.00	50.06	8.79	-	5.08	90.08	8.40
Cambodia	23	79.50	52.47	38.35	10.08	80.04	99.99	6.18	3.12	-	38.92	36.48	8.33
Tajikistan	24	78.24	43.89	10.74	1.27	93.73	100.00	6.82	3.21	92.48	23.65	65.67	37.57
Qatar	25	90.83	87.65	5.75	1.00	100.00	100.00	35.13	100.00	-	17.85	86.56	1.60
Myanmar	26	83.96	27.77	14.53	3.48	-	99.97	22.52	1.69	97.05	25.96	13.83	5.32
Mongolia	27	44.07	37.03	15.40	1.33	100.00	100.00	4.55	1.69	99.58	31.04	21.89	6.64
Sri Lanka	28	90.62	31.88	9.71	13.67	83.28	100.00	10.96	1.01	99.15	15.24	47.56	8.90
Bangladesh	29	100.00	51.62	8.46	2.98	90.46	99.99	7.95	3.18	85.57	2.71	21.13	1.22
Timor-Leste	30	1.00	9.24	11.61	3.50	-	100.00	-	-	73.66	-	22.39	1.06
India	31	76.81	43.21	7.15	16.85	100.00	16.55	55.65	3.26	-	5.37	68.69	8.06
Palestine	32	-	26.74	-	32.30	-	100.00	20.84	-	99.92	66.07	-	3.34
Jordan	33	61.15	57.28	15.70	12.46	94.01	100.00	31.02	13.79	-	20.48	44.54	14.16
Oman	34	40.95	60.71	37.52	29.82	100.00	100.00	47.36	100.00	-	6.68	48.06	3.80
Lebanon	35	16.44	13.01	7.20	8.05	-	100.00	36.65	9.72	-	6.14	48.31	5.47
Saudi Arabia	36	70.53	54.36	9.49	7.51	100.00	99.93	51.41	-	-	14.26	49.82	1.82
Afghanistan	37	-	1.00	27.39	4.01	-	100.00	18.77	-	-	100.00	-	1.62
Iran	38	-	36.00	-	14.40	100.00	-	65.78	15.70	-	5.64	37.24	10.17
Kuwait	39	72.97	100.00	8.12	2.40	99.82	100.00	10.13	-	-	37.20	28.93	2.67
Uzbekistan	40	59.13	37.55	28.54	2.74	-	99.98	22.46	5.83	4.43	-	-	5.25
Iraq	41	68.49	20.73	1.87	1.00	-	99.99	59.70	-	99.96	8.38	-	3.47
Pakistan	42	63.87	55.56	5.83	8.33	98.13	99.92	20.01	2.39	-	1.00	45.04	4.76
Bahrain	43	64.49	42.35	20.02	10.92	100.00	100.00	47.66	-	-	9.11	51.08	1.55
Yemen	44	-	11.29	3.10	1.02	-	100.00	23.59	-	82.14	49.10	15.85	1.51
Syria	-	68.36	38.75	-	2.62	-	-	2.48	-	-	3.05	17.61	5.75
Hong Kong	-	-	-	-	20.97	67.72	-	31.74	-	-	11.64	81.03	-
Turkmenistan	-	-	81.30	-	-	-	99.99	3.97	-	-	100.00	-	1.02
Turkey	-	73.53	-	-	-	100.00	-	32.06	-	-	5.66	-	-
Taiwan	-	-	-	-	-	99.52	-	-	11.89	-	5.11	79.01	-
North Korea	-	-	40.12	-	-	-	-	-	-	-	6.32	-	13.80
Macau	-	-	-	-	10.43	-	-	15.18	-	-	-	-	-
EUROPE													
Switzerland	1	77.84	93.65	29.49	19.89	57.31	100.00	100.00	2.71	-	3.98	100.00	-
Denmark	2	83.80	93.65	40.86	42.74	89.37	99.71	100.00	4.75	-	18.26	76.75	-

Table 19. Normalized values of green growth indicators for green economic opportunities *(continued)*

Country	Regional Rank	Indicators											
		GV1	GV2	GV3	GT1	GT2	GT3	GJ1	GJ2	GJ3	GN1	GN2	GN3
Austria	3	73.08	94.68	46.13	34.68	93.82	99.93	64.53	2.88	-	8.84	78.26	-
Germany	4	75.57	86.45	46.99	57.33	95.88	87.89	87.41	5.00	-	6.58	92.35	-
Czech republic	5	68.83	67.92	-	50.95	97.62	-	87.71	4.48	-	9.32	54.35	-
Sweden	6	82.86	91.59	31.12	40.80	85.82	99.89	41.62	2.57	-	11.63	89.08	-
Slovakia	7	61.53	46.64	92.19	65.05	96.82	99.83	75.86	3.90	-	11.39	40.76	-
Finland	8	70.97	68.94	30.13	33.48	93.32	99.97	69.99	2.42	-	10.51	99.14	-
United Kingdom	9	59.85	68.94	-	39.81	91.20	-	61.30	4.56	-	7.43	92.85	-
Belarus	10	73.68	45.27	38.26	12.24	99.83	99.94	47.90	1.45	99.87	-	-	-
Italy	11	66.04	63.80	-	36.37	94.74	99.62	61.59	3.07	-	7.76	52.59	-
Hungary	12	71.41	63.80	100.00	55.32	93.52	98.85	62.70	6.46	-	3.48	43.53	-
France	13	68.17	100.00	16.80	29.22	93.45	69.16	50.97	3.78	-	7.60	63.41	-
Netherlands	14	76.93	95.37	-	23.14	96.80	-	49.00	6.93	-	6.35	97.38	-
Estonia	15	78.35	78.21	64.89	29.11	93.84	99.98	45.68	5.14	-	11.26	55.11	-
Slovenia	16	70.96	81.30	75.21	31.64	89.22	99.99	66.09	2.58	-	7.31	51.83	-
Norway	17	83.49	68.77	18.79	9.30	98.38	100.00	52.21	1.65	-	11.90	78.01	-
Lithuania	18	72.20	63.80	58.34	26.44	88.79	99.60	39.94	9.81	-	5.77	59.13	-
Portugal	19	59.59	69.63	25.99	33.89	95.79	99.99	47.19	4.42	-	3.36	62.65	-
Croatia	20	66.86	81.30	35.56	28.77	94.11	99.95	54.78	4.11	-	17.79	25.91	-
Latvia	21	59.62	47.33	30.40	18.77	79.47	99.86	48.37	8.24	-	21.28	34.47	-
Luxembourg	22	83.71	91.59	20.41	28.59	99.24	100.00	14.08	2.74	-	10.58	78.26	-
Albania	23	59.62	29.82	10.15	2.12	96.04	100.00	11.92	7.26	99.99	27.31	43.53	-
Spain	24	66.45	68.43	16.88	30.41	96.65	99.15	58.26	5.45	-	11.50	44.28	-
Poland	25	70.43	62.77	52.14	35.02	100.00	95.01	58.14	9.51	-	8.36	38.24	-
Belgium	26	72.17	63.80	40.27	20.89	79.97	99.93	48.46	2.88	-	9.31	89.83	-
Romania	27	62.23	53.50	42.07	49.90	97.90	94.50	50.67	4.50	-	8.44	36.23	-
Bulgaria	28	67.22	58.65	39.46	36.91	100.00	97.60	50.50	9.14	-	8.92	41.77	-
Bosnia and Herzegovina	29	-	50.41	40.27	25.85	-	100.00	33.82	1.05	99.89	25.50	27.68	-
Macedonia	30	75.33	29.82	-	100.00	-	-	33.90	1.33	99.01	17.53	43.78	-
Serbia	31	63.22	24.16	46.77	28.62	-	99.74	18.05	1.12	99.99	8.62	36.73	-
Greece	32	52.32	73.06	13.88	16.51	100.00	99.84	33.07	7.39	-	4.05	21.38	-
Russia	33	64.21	78.04	-	7.49	100.00	-	76.09	2.21	100.00	7.23	54.10	-
Moldova	34	64.68	31.20	-	11.66	-	-	33.05	1.04	99.96	6.90	25.16	-
Ukraine	35	52.51	31.88	20.32	8.72	100.00	53.30	56.80	3.53	99.99	6.42	42.52	-
Ireland	36	83.36	79.93	9.33	8.30	95.60	100.00	12.34	3.55	-	6.00	84.05	-
Iceland	37	63.27	81.30	8.86	3.46	-	100.00	33.55	1.14	-	2.08	76.75	-
Malta	38	-	74.09	12.82	21.20	1.00	100.00	11.66	11.68	-	5.21	57.87	-
Montenegro	39	-	22.62	16.92	9.33	-	100.00	17.68	1.13	98.95	32.13	37.99	-
Andorra	-	-	34.97	9.16	-	-	-	-	-	-	20.33	-	-
Faeroe Islands	-	-	-	-	3.23	-	-	-	-	-	32.13	-	-
Liechtenstein	-	-	74.78	-	-	-	-	1.00	-	-	1.67	-	-
Monaco	-	-	97.60	-	-	-	-	-	-	-	5.22	-	-
San Marino	-	-	71.00	-	-	-	-	-	-	-	4.19	-	-
Gibraltar	-	-	-	-	-	-	-	-	-	-	29.52	-	-

Table 19. Normalized values of green growth indicators for green economic opportunities *(continued)*

Country	Regional Rank	Indicators											
		GV1	GV2	GV3	GT1	GT2	GT3	GJ1	GJ2	GJ3	GN1	GN2	GN3
OCEANIA													
New Zealand	1	69.08	58.31	8.97	10.25	96.48	100.00	40.87	1.19	-	5.42	78.76	-
Fiji	2	61.68	63.80	29.94	56.61	-	100.00	2.54	-	-	60.85	-	17.06
Australia	3	64.28	87.47	8.42	6.67	100.00	1.00	51.20	4.60	-	9.30	65.17	-
Papua New Guinea	4	62.33	6.15	39.08	13.61	-	100.00	-	-	-	59.28	-	3.27
Tonga	-	50.67	9.24	23.51	3.74	-	-	1.00	-	-	100.00	-	5.95
Samoa	-	93.99	71.00	13.26	3.62	-	-	-	-	-	49.10	-	9.98
Solomon Islands	-	78.85	21.59	12.44	1.41	-	-	-	-	-	100.00	-	1.34
Vanuatu	-	100.00	15.41	10.91	1.14	-	-	-	-	-	100.00	-	3.48
Tuvalu	-	-	31.88	-	2.23	-	-	-	-	-	10.42	-	14.95
Palau	-	-	15.41	21.97	1.49	-	-	-	-	-	-	-	7.54
Kiribati	-	-	-	16.07	2.57	-	-	-	-	-	66.07	-	2.49
Marshall Islands	-	-	15.41	-	-	-	-	1.00	-	-	28.14	-	3.61
New Caledonia	-	-	-	8.99	1.81	-	-	-	-	-	27.29	-	47.82
French Polynesia	-	-	-	11.17	12.06	-	-	-	-	-	-	-	21.57
Micronesia, Fed. Sts.	-	-	42.18	-	1.23	-	-	-	-	-	-	-	3.05
Cook Islands	-	-	-	-	-	-	-	-	-	-	-	-	19.98
Nauru	-	-	-	-	-	-	-	-	-	-	-	-	12.33
Niue	-	-	-	-	-	-	-	-	-	-	-	-	33.84
American Samoa	-	-	-	-	-	-	-	-	-	-	-	-	8.74
Guam	-	-	-	-	-	-	-	-	-	-	-	-	14.89
Tokelau	-	-	-	-	-	-	-	-	-	-	-	-	39.61

Definitions:
GV1: Adjusted net savings, including particulate emission damage (Percent GNI)
GV2: Degree of integrated water resources management implementation, financing (Percent)
GV3: Total amount of funding to promote environmentally sound technologies per GDP: Amount of tracked exported Environmentally Sound Technologies (current United States dollars)
GT1: Share of export of environmental goods to total export (Percent)
GT2: CO2 emissions embedded in trade (Percent)
GT3: Water virtual trade flows (tons per hectare)
GJ1: Share of green manufacturing employment in total manufacturing employment (Percent)
GJ2: Ratio of renewable energy employment to renewable energy production (Ratio)
GJ3: Employed population below international poverty line (Percent)
GN1: Development of environment-related technologies (Percent)
GN2: University-industry collaboration in Research & Development (Score)
GN3: Installed renewable energy-generating capacity in developing countries (watts per capita)

Table 20. Normalized values of Green growth indicators for social inclusion

Country	Regional Rank	Indicators											
		AB1	AB2	AB3	GB1	GB2	GB3	SE1	SE2	SE3	SP1	SP2	SP3
AFRICA													
Gabon	1	93.20	61.21	16.29	30.09	93.08	25.75	87.08	73.64	-	39.41	30.79	54.87
Mauritius	2	100.00	86.97	61.53	40.60	98.91	100.00	88.02	99.89	73.45	100.00	53.82	48.83
Seychelles	3	100.00	100.00	88.42	46.26	-	75.25	93.97	100.00	66.72	100.00	66.00	48.83
Togo	4	24.08	75.30	21.16	37.99	89.73	100.00	86.85	68.54	85.25	16.74	24.02	59.58
Cabo Verde	5	96.97	75.68	77.36	51.88	-	75.25	79.88	99.82	64.19	70.10	60.59	51.22
Namibia	6	51.65	61.50	69.64	88.58	97.38	75.25	25.29	86.22	59.21	100.00	49.75	56.49
Cote d'Ivoire	7	41.23	81.47	31.64	24.09	70.42	50.50	90.30	87.93	71.94	17.04	22.67	45.38
Gambia	8	43.70	60.44	94.06	18.07	84.68	75.25	85.48	81.81	55.68	17.83	26.73	61.03
Burkina Faso	9	10.65	70.28	25.38	25.17	84.14	25.75	87.34	1.00	47.56	7.63	18.61	53.06
Zambia	10	45.37	31.68	13.06	34.20	93.05	100.00	57.02	47.20	62.42	13.34	40.27	49.28
Guinea	11	45.27	80.12	20.84	46.16	77.58	50.50	96.37	64.00	56.12	3.48	18.61	50.26
Tanzania	12	24.04	54.07	40.25	74.06	87.92	100.00	83.01	74.72	81.62	6.94	22.67	48.24
Cameroon	13	63.22	89.00	6.01	68.10	95.86	25.75	80.04	69.64	78.22	19.12	24.02	65.66
South Africa	14	78.13	84.37	26.60	92.58	99.20	100.00	1.00	99.22	60.87	81.26	60.59	74.57
Benin	15	18.48	80.12	40.53	15.67	80.73	50.50	91.15	69.64	55.10	10.01	15.90	29.64
Uganda	16	23.30	28.79	15.33	69.47	98.83	100.00	79.15	88.94	82.32	13.85	30.79	44.63
Botswana	17	74.78	53.11	69.43	23.00	91.93	75.25	52.45	68.98	52.67	100.00	38.92	58.38
Lesotho	18	39.21	-	13.17	47.19	98.20	75.25	74.43	86.61	55.04	100.00	36.21	73.14
Senegal	19	33.25	91.12	35.22	85.85	90.04	25.75	88.95	86.52	56.63	26.05	32.15	61.03
Zimbabwe	20	33.17	26.47	17.20	64.06	90.82	75.25	76.56	83.08	61.07	20.40	38.92	68.27
Malawi	21	22.54	61.60	30.63	42.05	89.49	100.00	85.75	4.93	75.15	9.81	29.44	50.78
Kenya	22	51.60	33.42	31.14	44.12	95.64	100.00	85.50	94.57	76.02	20.60	36.21	49.31
Burundi	23	6.13	-	26.02	76.66	95.23	75.25	87.32	1.00	85.68	14.17	19.96	61.38
Ethiopia	24	21.81	57.16	24.01	77.74	82.84	25.75	89.96	86.95	77.55	4.86	11.83	32.41
Mali	25	31.41	88.61	21.32	57.57	95.23	50.50	89.76	51.07	60.52	6.54	19.96	40.44
Rwanda	26	48.30	35.35	27.69	100.00	90.00	100.00	77.38	82.78	63.43	4.07	30.79	59.70
Mozambique	27	28.10	52.14	30.56	86.54	75.96	50.50	61.48	1.00	-	33.72	24.02	42.24
Ghana	28	46.07	88.04	23.83	29.81	92.27	50.50	77.41	96.41	64.52	16.54	29.44	64.81
Morocco	29	77.62	86.68	49.91	41.61	70.34	50.50	84.12	100.00	54.88	24.17	57.88	88.60
Tunisia	30	84.45	93.82	54.92	53.01	76.23	25.75	91.87	100.00	65.72	100.00	55.17	91.97
Sierra Leone	31	13.68	45.58	15.44	25.41	85.53	50.50	89.47	1.00	57.57	7.93	19.96	48.21
Mauritania	32	46.63	82.05	24.91	41.11	59.83	25.75	94.09	1.00	43.62	17.04	18.61	40.47
Nigeria	33	37.72	65.26	10.95	8.15	75.57	50.50	90.62	74.74	82.21	20.40	15.90	49.03
Central African Republic	34	7.62	54.65	14.50	17.97	64.11	50.50	78.82	1.00	-	5.65	7.77	27.58
Algeria	35	76.56	100.00	44.11	52.00	65.73	50.50	97.63	99.92	73.18	88.71	64.65	86.08
Angola	36	46.10	55.23	8.90	60.40	74.24	50.50	58.28	27.18	72.24	16.15	14.54	34.18
Madagascar	37	20.00	23.39	55.38	37.71	96.21	25.75	79.30	38.74	95.11	20.01	11.83	30.93
Egypt	38	82.82	86.01	25.12	55.51	89.02	1.00	93.29	100.00	65.55	58.25	59.23	98.28
Niger	39	9.35	74.33	14.50	43.43	87.99	75.25	92.39	33.65	12.21	6.74	11.83	25.97
Sudan	40	61.49	78.68	10.12	55.75	57.23	1.00	91.12	92.30	40.49	11.49	24.02	22.54
Libya	41	44.45	78.00	-	32.60	92.26	75.25	-	1.00	-	79.61	48.40	82.57
Chad	-	5.42	32.26	10.58	31.50	95.75	50.50	87.00	1.00	52.61	6.74	3.71	13.82

Table 20. Normalized values of Green growth indicators for social inclusion *(continued)*

Country	Regional Rank	Indicators											
		AB1	AB2	AB3	GB1	GB2	GB3	SE1	SE2	SE3	SP1	SP2	SP3
Comoros	-	89.43	67.39	10.08	34.01	84.29	100.00	73.78	97.73	70.92	8.03	29.44	33.19
Congo Republic	-	45.94	48.28	36.90	23.29	93.51	25.75	64.49	51.12	71.50	22.88	19.96	45.38
Djibouti	-	50.08	76.36	29.21	52.78	62.59	50.50	80.73	89.12	70.79	15.06	24.02	48.83
DR Congo	-	11.44	28.60	20.54	26.34	72.14	50.50	75.24	1.00	59.87	15.85	21.31	17.64
Equatorial Guinea	-	65.47	-	1.00	43.57	-	100.00	-	1.00	-	4.66	26.73	32.02
Eritrea	-	51.23	-	19.92	44.56	-	75.25	-	87.93	-	-	25.38	48.83
Eswatini	-	81.48	76.07	23.87	19.99	95.42	50.50	48.29	99.39	56.07	100.00	40.27	87.01
Guinea-Bissau	-	22.11	37.86	41.43	28.19	-	1.00	92.38	68.53	68.90	15.55	14.54	37.99
Liberia	-	28.63	25.89	2.25	22.70	85.72	100.00	90.41	38.96	47.84	4.37	25.38	33.76
Sao Tome and Principe	-	47.08	68.35	27.61	29.81	-	75.25	82.21	99.06	-	55.25	44.34	36.89
Somalia	-	37.97	1.00	26.20	49.23	87.73	50.50	-	85.67	44.07	1.00	1.00	48.83
South Sudan	-	1.00	62.18	22.17	57.35	65.01	100.00	76.65	81.46	-	1.00	10.48	1.00
Reunion	-	85.58	-	-	-	-	-	-	-	63.42	-	-	48.83
Mayotte	-	92.11	-	-	-	-	-	-	-	-	-	-	48.83
St. Helena	-	88.73	-	-	-	-	-	-	-	-	-	-	51.22
Western Sahara	-	-	-	-	-	-	-	-	-	-	-	-	82.57
THE AMERICAS													
United States	1	98.09	100.00	57.93	51.30	98.34	75.25	84.44	100.00	85.66	100.00	80.90	99.86
Paraguay	2	71.89	91.32	8.96	31.94	98.55	100.00	74.36	100.00	76.20	82.38	61.94	84.13
Brazil	3	77.88	92.47	69.11	30.52	96.81	75.25	51.29	99.69	69.69	88.71	72.77	84.34
Chile	4	97.94	100.00	86.31	45.71	99.54	75.25	75.29	100.00	81.53	71.88	75.48	92.30
Uruguay	5	100.00	100.00	54.25	47.00	98.05	75.25	82.76	100.00	81.72	100.00	75.48	98.63
Costa Rica	6	67.16	100.00	39.48	91.31	89.59	62.88	67.25	99.99	78.00	57.33	74.13	96.27
Panama	7	94.77	89.19	33.34	45.63	96.29	50.50	61.65	99.96	78.08	61.89	70.07	82.87
Canada	8	94.06	100.00	72.04	61.69	99.89	100.00	94.34	100.00	84.95	100.00	87.67	99.08
Jamaica	9	100.00	85.91	30.69	57.57	97.93	50.50	83.55	100.00	66.67	52.65	64.65	99.07
Mexico	10	67.05	94.02	34.18	96.44	86.23	75.25	77.16	99.98	76.54	100.00	66.00	81.50
El Salvador	11	97.67	86.88	26.05	63.46	77.80	75.25	85.79	99.40	69.98	25.26	70.07	82.67
Bolivia	12	99.90	55.61	41.51	92.38	92.92	100.00	82.57	99.49	87.22	100.00	52.46	51.00
Venezuela	13	61.49	66.04	39.57	44.88	95.08	75.25	74.93	100.00	52.50	100.00	66.00	72.99
Suriname	14	58.12	80.51	16.34	59.23	-	75.25	85.13	99.84	76.71	100.00	49.75	83.39
Colombia	15	62.43	91.89	62.87	38.01	94.58	50.50	45.77	100.00	68.75	51.49	72.77	89.81
Nicaragua	16	69.66	62.18	49.28	95.64	81.88	75.25	71.80	94.41	68.66	35.65	59.23	94.20
Argentina	17	71.84	93.82	56.15	89.61	97.49	50.50	81.76	100.00	79.68	90.89	71.42	84.76
Dominican Republic	18	60.29	88.81	12.92	56.22	95.97	75.25	88.17	99.56	65.95	8.52	68.71	88.18
Ecuador	19	68.23	73.18	31.86	77.61	90.90	100.00	73.65	100.00	76.39	66.44	68.71	39.25
Peru	20	67.16	86.49	24.59	60.40	92.69	100.00	83.13	97.95	70.84	37.33	60.59	53.44
Guatemala	21	76.66	75.68	43.47	39.37	93.22	50.50	66.87	99.94	62.19	24.07	44.34	60.48
Honduras	22	69.38	60.63	18.76	42.76	71.52	50.50	65.68	98.33	64.36	12.19	51.11	66.89
Guyana	23	67.15	100.00	16.61	70.79	-	100.00	74.11	99.23	40.67	100.00	67.36	88.12
Belize	24	98.53	91.12	41.26	22.66	92.25	50.50	51.12	99.85	61.30	38.13	56.52	83.47

Table 20. Normalized values of Green growth indicators for social inclusion *(continued)*

Country	Regional Rank	Indicators											
		AB1	AB2	AB3	GB1	GB2	GB3	SE1	SE2	SE3	SP1	SP2	SP3
Trinidad and Tobago	25	100.00	75.68	29.61	57.57	91.72	75.25	83.17	100.00	78.38	90.89	66.00	90.93
Barbados	26	100.00	93.25	46.12	40.60	-	50.50	-	100.00	62.91	98.42	68.71	-
Antigua and Barbuda	-	100.00	-	12.67	23.00	-	75.25	-	100.00	-	84.56	67.36	97.22
Bahamas	-	100.00	-	10.04	26.38	-	75.25	-	100.00	-	75.05	68.71	-
Cuba	-	69.30	100.00	54.16	100.00	-	-	-	100.00	-	61.29	76.84	88.40
Dominica	-	100.00	74.14	75.42	75.25	-	50.50	-	100.00	-	92.77	30.79	-
Grenada	-	91.69	-	50.29	93.41	-	100.00	77.96	-	63.01	53.97	59.23	-
Haiti	-	46.94	2.74	14.87	6.03	92.63	100.00	81.85	1.00	73.00	1.56	37.56	47.71
Puerto Rico	-	76.41	-	54.98	-	95.20	75.25	-	100.00	-	80.99	-	-
St. Kitts and Nevis	-	100.00	-	66.03	45.55	-	50.50	-	100.00	-	84.85	71.42	-
St. Lucia	-	100.00	-	40.88	34.01	-	100.00	77.30	100.00	64.97	48.92	68.71	99.53
Aruba	-	100.00	-	-	-	-	-	-	100.00	78.79	100.00	-	100.00
Bermuda	-	100.00	-	-	-	-	-	-	100.00	91.28	92.87	-	99.90
St. Vincent and the Grenadines	-	100.00	89.00	48.37	37.00	-	50.50	-	100.00	-	52.28	57.88	97.10
Turks and Caicos Islands	-	58.52	-	-	-	-	-	-	100.00	-	36.15	-	99.34
Cayman Islands	-	100.00	-	-	-	-	-	-	100.00	-	4.07	-	94.24
Curacao	-	100.00	-	-	-	-	-	-	100.00	77.64	100.00	-	-
Sint Maarten	-	100.00	-	-	-	-	-	-	100.00	-	100.00	-	96.96
British Virgin Islands	-	100.00	-	-	-	-	-	-	100.00	-	59.71	-	99.86
French Guiana	-	82.47	-	-	-	-	-	-	-	-	55.95	-	-
Greenland	-	47.67	-	-	-	-	-	-	100.00	-	100.00	-	-
Guadeloupe	-	95.51	-	-	-	-	-	-	-	-	82.48	-	-
Martinique	-	98.71	-	-	-	-	-	-	-	-	72.38	-	99.59
Anguilla	-	100.00	-	-	-	-	-	-	-	-	66.44	-	98.48
United States Virgin Islands	-	98.92	-	-	-	-	-	-	100.00	-	95.05	-	98.85
St. Pierre and Miquelon	-	82.34	-	-	-	-	-	-	-	-	100.00	-	-
Saint-Martin	-	98.24	-	-	-	-	-	-	100.00	-	43.27	-	-
Bonaire, Saint Eustatius and Saba	-	100.00	-	-	-	-	-	-	-	-	-	-	-
St. Barths	-	100.00	-	-	-	-	-	-	-	-	-	-	-
Falkland Islands	-	-	-	-	-	-	-	-	-	95.80	-	-	-
Montserrat	-	-	-	-	-	-	-	-	-	-	100.00	-	-
ASIA													
Japan	1	99.23	93.44	71.49	20.72	99.69	25.75	92.87	100.00	95.94	100.00	76.84	97.90
Laos	2	57.79	88.23	21.99	55.49	98.75	75.25	85.41	100.00	71.19	7.93	34.86	67.46
Georgia	3	62.75	89.96	95.00	37.51	99.73	75.25	91.52	100.00	68.12	100.00	56.52	92.56
China	4	82.85	100.00	49.75	50.38	98.77	25.75	87.62	100.00	-	100.00	74.13	72.34
Thailand	5	61.39	89.19	24.16	33.93	97.35	75.25	90.77	100.00	81.09	82.77	75.48	97.90
Bhutan	6	73.44	-	31.27	30.48	82.96	100.00	97.20	100.00	76.16	19.61	45.69	48.51

Table 20. Normalized values of Green growth indicators for social inclusion *(continued)*

Country	Regional Rank	Indicators											
		AB1	AB2	AB3	GB1	GB2	GB3	SE1	SE2	SE3	SP1	SP2	SP3
Malaysia	7	92.99	100.00	47.49	29.53	99.18	50.50	82.74	100.00	86.90	19.40	67.36	77.30
Philippines	8	67.01	88.61	43.27	55.11	92.81	100.00	82.68	99.27	76.81	65.94	42.98	62.30
Vietnam	9	65.62	89.96	48.63	53.91	94.33	62.88	89.29	100.00	85.49	41.49	56.52	86.92
Cyprus	10	91.83	100.00	87.01	29.29	99.59	75.25	94.17	100.00	81.15	80.10	74.13	99.69
Indonesia	11	62.75	86.11	30.03	43.71	99.09	75.25	87.09	99.81	-	31.89	38.92	79.60
Maldives	12	100.00	-	98.75	10.11	93.66	75.25	96.62	100.00	66.38	100.00	47.04	63.38
Armenia	13	62.73	100.00	67.88	48.24	94.25	75.25	97.35	100.00	69.94	82.08	56.52	91.18
South Korea	14	99.56	100.00	72.70	38.74	99.99	25.75	94.75	100.00	-	100.00	84.96	95.43
Kyrgyz Republic	15	89.12	88.23	51.78	38.96	97.35	25.75	96.50	99.98	79.65	100.00	57.88	97.44
Israel	16	98.51	100.00	99.74	48.86	99.08	50.50	87.02	100.00	80.21	100.00	79.55	100.00
Azerbaijan	17	79.30	100.00	69.03	35.64	83.10	1.00	97.81	100.00	87.64	97.96	53.82	71.70
Kazakhstan	18	94.43	100.00	32.56	54.66	97.16	25.75	96.16	100.00	87.83	95.74	72.77	99.17
Nepal	19	50.46	89.00	30.28	65.81	92.73	100.00	92.77	99.85	55.53	77.43	37.56	57.72
United Arab Emirates	20	99.20	93.82	49.14	100.00	99.37	100.00	99.58	100.00	86.26	20.50	75.48	99.88
Brunei Darussalam	21	100.00	-	28.11	19.00	-	75.25	-	100.00	74.40	100.00	70.07	77.30
Singapore	22	100.00	-	98.96	58.68	99.40	75.25	-	100.00	91.50	37.93	84.96	77.30
Cambodia	23	48.05	91.12	35.55	42.18	97.58	75.25	-	98.63	92.05	9.02	42.98	57.60
Tajikistan	24	76.37	83.21	39.07	43.43	99.84	50.50	91.70	99.89	46.02	100.00	55.17	82.07
Qatar	25	98.81	-	80.51	20.32	95.26	50.50	-	100.00	-	8.92	67.36	99.42
Myanmar	26	62.19	89.77	40.38	31.27	96.95	50.50	94.85	94.55	80.76	15.75	34.86	38.75
Mongolia	27	66.95	92.96	45.57	34.88	99.54	75.25	94.56	100.00	77.19	100.00	52.46	81.21
Sri Lanka	28	72.33	92.09	43.67	11.55	99.99	25.75	86.82	100.00	72.47	31.79	55.17	48.51
Bangladesh	29	61.45	77.04	50.41	42.30	81.38	25.75	91.98	99.92	61.62	57.33	34.86	45.87
Timor-Leste	30	99.69	69.32	13.33	80.20	-	100.00	96.64	100.00	62.74	100.00	34.86	64.37
India	31	74.54	73.56	33.21	30.96	99.98	25.75	93.10	99.92	62.44	43.92	49.75	50.48
Palestine	32	82.71	-	16.43	-	75.06	1.00	92.47	100.00	59.17	25.75	-	79.51
Jordan	33	88.82	65.46	4.30	25.37	69.96	75.25	91.80	99.88	57.97	46.64	52.46	82.43
Oman	34	95.21	89.00	25.52	5.61	86.73	25.75	-	100.00	-	47.13	59.23	100.00
Lebanon	35	55.83	81.47	21.37	10.29	79.74	50.50	94.22	100.00	69.90	10.90	63.29	95.26
Saudi Arabia	36	89.50	94.21	27.51	40.34	88.06	100.00	-	100.00	76.48	25.26	64.65	99.42
Afghanistan	37	61.06	41.33	53.44	54.50	10.46	1.00	-	99.73	44.13	25.45	19.96	23.41
Iran	38	96.98	87.46	35.67	12.07	95.22	50.50	91.02	100.00	65.53	87.33	64.65	48.51
Kuwait	39	100.00	100.00	37.01	13.38	94.41	1.00	-	100.00	-	26.15	70.07	100.00
Uzbekistan	40	84.09	100.00	15.67	67.47	87.74	25.75	-	100.00	-	100.00	66.00	94.13
Iraq	41	69.48	68.93	9.92	53.35	79.49	50.50	96.17	100.00	52.76	49.41	44.34	48.15
Pakistan	42	71.54	60.05	66.48	41.53	54.54	25.75	95.51	99.17	55.79	9.61	25.38	41.17
Bahrain	43	96.91	-	18.41	30.70	93.97	13.38	-	100.00	-	47.04	67.36	-
Yemen	44	45.14	23.77	39.09	1.00	1.00	25.75	88.44	95.24	42.74	10.97	21.31	53.55
Hong Kong	-	98.78	100.00	-	-	99.63	75.25	-	100.00	91.39	73.47	-	98.16
Turkmenistan	-	97.32	92.09	20.57	52.20	88.03	-	82.72	100.00	-	77.43	66.00	91.19
North Korea	-	58.78	5.82	25.70	35.87	-	-	-	-	-	-	56.52	75.79
Syria	-	88.49	34.39	30.18	22.38	84.72	1.00	98.94	96.33	-	17.83	51.11	69.04

Table 20. Normalized values of Green growth indicators for social inclusion *(continued)*

Country	Regional Rank	Indicators											
		AB1	AB2	AB3	GB1	GB2	GB3	SE1	SE2	SE3	SP1	SP2	SP3
Macau	-	88.88	79.35	-	-	-	-	-	100.00	93.62	44.96	-	100.00
Turkey	-	-	-	-	-	-	75.25	75.66	-	-	-	-	-
Taiwan	-	-	-	-	-	-	100.00	-	-	-	-	-	-
EUROPE													
Switzerland	1	98.78	100.00	92.81	83.59	99.59	100.00	92.03	100.00	87.55	99.31	80.90	100.00
Denmark	2	99.55	100.00	93.50	79.53	100.00	100.00	97.00	100.00	91.31	100.00	75.48	100.00
Austria	3	99.50	100.00	95.60	81.07	99.96	100.00	95.35	100.00	84.42	100.00	79.55	99.95
Germany	4	98.89	100.00	91.19	62.99	99.98	100.00	94.19	100.00	91.27	100.00	83.61	100.00
Czech republic	5	95.67	100.00	90.05	46.05	98.64	100.00	98.75	100.00	90.27	100.00	78.19	99.95
Sweden	6	98.36	100.00	86.69	92.91	99.74	100.00	96.59	100.00	93.62	100.00	79.55	99.83
Slovakia	7	93.61	93.05	92.16	44.56	98.52	75.25	100.00	100.00	87.19	100.00	75.48	99.94
Finland	8	96.39	100.00	94.05	91.09	99.61	100.00	97.70	100.00	89.64	100.00	80.90	100.00
United Kingdom	9	99.27	100.00	95.39	69.33	99.88	100.00	93.58	100.00	85.62	100.00	83.61	99.88
Belarus	10	88.88	100.00	97.78	80.20	99.79	50.50	100.00	100.00	-	100.00	71.42	100.00
Italy	11	90.14	100.00	94.45	71.71	99.83	100.00	90.93	100.00	76.15	100.00	78.19	99.98
Hungary	12	95.76	100.00	92.02	26.88	98.63	75.25	96.12	100.00	87.31	99.01	71.42	92.43
France	13	96.29	100.00	95.14	79.23	99.33	100.00	94.33	100.00	85.18	100.00	79.55	100.00
Netherlands	14	99.12	100.00	85.80	69.64	99.78	100.00	99.23	100.00	95.79	100.00	79.55	100.00
Estonia	15	95.62	100.00	99.08	55.89	99.80	100.00	94.42	100.00	86.24	100.00	71.42	99.83
Slovenia	16	93.83	100.00	92.25	57.10	99.22	75.25	100.00	100.00	89.44	100.00	78.19	99.45
Norway	17	91.94	100.00	91.11	85.94	99.57	100.00	97.84	100.00	92.00	100.00	82.25	100.00
Lithuania	18	96.61	100.00	88.10	57.17	96.95	100.00	88.57	100.00	87.62	100.00	66.00	99.67
Portugal	19	95.78	100.00	93.57	72.46	97.60	100.00	90.94	100.00	89.95	96.73	83.61	99.95
Croatia	20	87.22	100.00	88.37	63.94	98.16	100.00	97.12	100.00	84.72	93.27	72.77	99.66
Latvia	21	93.84	100.00	89.36	58.42	99.11	100.00	91.64	100.00	90.03	100.00	66.00	99.37
Luxembourg	22	98.37	100.00	97.31	62.05	99.50	100.00	93.29	100.00	87.22	100.00	76.84	99.98
Albania	23	74.55	91.61	62.43	59.43	96.96	100.00	96.60	100.00	66.96	96.54	51.11	97.16
Spain	24	96.35	100.00	95.62	84.97	99.31	100.00	92.34	100.00	85.22	89.01	79.55	99.95
Poland	25	95.41	100.00	92.22	56.95	99.97	100.00	97.20	100.00	89.71	83.07	75.48	95.57
Belgium	26	98.13	100.00	92.58	85.49	99.69	100.00	98.64	100.00	90.87	100.00	80.90	100.00
Romania	27	89.41	100.00	74.65	38.80	95.60	100.00	92.72	100.00	77.57	98.91	70.07	97.96
Bulgaria	28	89.22	94.79	84.77	48.86	99.63	100.00	85.48	99.96	82.47	93.07	63.29	99.79
Bosnia and Herzegovina	29	79.60	100.00	70.14	43.43	89.13	50.50	93.19	100.00	77.44	75.55	53.82	99.67
Macedonia	30	62.54	94.31	66.53	83.51	94.41	50.50	93.23	100.00	76.38	66.14	64.65	99.81
Serbia	31	65.28	100.00	58.32	69.90	99.61	100.00	92.76	100.00	79.69	53.97	61.94	99.33
Greece	32	96.87	100.00	90.93	42.58	98.71	100.00	93.23	100.00	85.45	99.21	68.71	99.95
Russia	33	78.18	100.00	79.32	32.24	99.60	50.50	89.17	99.91	84.10	100.00	71.42	97.25
Moldova	34	87.04	100.00	70.29	50.01	98.16	100.00	98.94	100.00	80.84	94.06	60.59	93.17
Ukraine	35	85.89	88.81	74.72	41.45	96.70	1.00	99.14	100.00	78.91	96.24	67.36	98.84
Ireland	36	91.55	100.00	89.86	45.20	99.89	100.00	95.45	100.00	91.61	95.84	76.84	91.07
Iceland	37	100.00	100.00	91.12	78.00	100.00	100.00	98.70	100.00	92.19	82.58	84.96	100.00
Malta	38	95.80	100.00	97.21	27.59	99.02	75.25	94.36	100.00	92.02	93.27	79.55	99.96
Montenegro	39	79.95	100.00	84.53	57.23	99.00	50.50	91.88	100.00	73.00	78.22	61.94	90.78

Table 20. Normalized values of Green growth indicators for social inclusion *(continued)*

Country	Regional Rank	Indicators											
		AB1	AB2	AB3	GB1	GB2	GB3	SE1	SE2	SE3	SP1	SP2	SP3
Andorra	-	96.73	-	-	92.93	-	-	-	100.00	-	100.00	71.42	100.00
Faeroe Islands	-	100.00	-	-	-	-	-	-	100.00	-	-	-	-
Gibraltar	-	100.00	-	-	-	-	-	-	100.00	-	-	-	100.00
Monaco	-	100.00	-	86.57	66.99	-	-	-	100.00	-	-	80.90	100.00
San Marino	-	96.58	-	85.22	66.99	-	75.25	-	100.00	-	-	68.71	-
Liechtenstein	-	98.68	-	96.74	24.76	-	-	-	100.00	-	100.00	-	-
Isle of Man	-	94.60	-	-	-	-	-	-	100.00	-	-	-	-
Kosovo	-	-	-	-	-	81.08	-	96.22	-	-	-	-	-
Guernsey	-	-	-	-	-	-	-	-	-	-	100.00	-	-
OCEANIA													
New Zealand	1	96.07	100.00	94.00	100.00	99.57	100.00	-	100.00	85.18	100.00	79.55	100.00
Fiji	2	59.07	87.26	22.00	39.83	-	50.50	95.30	98.63	74.28	100.00	42.98	90.12
Australia	3	97.81	100.00	83.93	61.97	99.41	100.00	91.65	100.00	88.53	74.66	82.25	99.96
Papua New Guinea	4	15.23	46.54	15.95	1.00	-	25.75	80.59	60.57	64.57	2.88	5.06	76.60
French Polynesia	-	90.48	89.58	16.77	-	-	-	-	100.00	-	-	-	98.42
Cook Islands	-	100.00	-	-	-	-	-	-	-	84.00	67.53	26.73	-
Kiribati	-	41.96	92.86	-	14.21	-	100.00	97.56	99.26	39.15	93.86	29.44	93.76
Marshall Islands	-	100.00	-	-	13.00	-	100.00	90.19	99.55	48.87	63.07	44.34	97.50
Micronesia, Fed. Sts.	-	84.62	-	-	1.00	-	75.25	84.12	97.34	63.32	97.03	29.44	-
Nauru	-	100.00	-	-	21.85	-	-	93.65	100.00	47.57	95.74	45.69	99.37
New Caledonia	-	98.36	89.19	-	-	-	-	-	100.00	57.76	98.81	-	99.74
Palau	-	95.00	-	-	13.38	-	75.25	-	100.00	76.90	100.00	52.46	99.60
Samoa	-	66.31	89.58	16.13	20.80	-	75.25	85.32	99.76	63.23	91.90	38.92	90.72
Solomon Islands	-	74.88	62.56	4.08	16.84	-	25.75	88.07	99.47	90.96	21.30	28.08	97.95
Tonga	-	51.71	-	-	15.67	-	75.25	98.25	100.00	76.08	100.00	41.63	99.68
Tuvalu	-	46.26	-	-	13.38	-	-	85.13	99.90	9.06	100.00	34.86	85.87
Vanuatu	-	70.28	84.75	-	1.00	-	50.50	93.62	93.42	39.21	5.06	28.08	95.92
Niue	-	96.36	-	-	-	-	-	-	-	86.13	100.00	24.02	-
Northern Mariana Islands	-	95.10	-	4.78	-	-	-	-	100.00	-	-	-	99.79
Guam	-	99.51	-	-	-	-	-	-	100.00	-	-	-	99.42
Wallis and Futuna Islands	-	67.43	-	-	-	-	-	-	-	74.28	-	-	-
American Samoa	-	61.72	-	-	-	-	-	-	-	-	-	-	-
Tokelau	-	-	-	-	-	-	-	-	-	1.00	-	-	-

Table 20. Normalized values of Green growth indicators for social inclusion *(continued)*

Country	Regional Rank	Indicators											
		AB1	AB2	AB3	GB1	GB2	GB3	SE1	SE2	SE3	SP1	SP2	SP3

Definitions:
AB1: Proportion of population using safely managed water and sanitation services, electricity, and clean fuels (%)
AB2: Prevalence of undernourishment (Percent)
AB3: Proportion of the population with convenient access to public transport (Percent)
GB1: Proportion of seats held by women in national parliaments (Percent)
GB2: Ratio of female to male with account in financial institution, age 15+ (Percent)
GB3: Getting paid, covering laws and regulations for equal gender pay (Score)
SE1: Inequality in income: Palma ratio (Ratio)
SE2: Ratio of urban to rural, access to electricity (Ratio)
SE3: Share of youth not in education, employment or training, aged 15-24 years (Percent)
SP1: Proportion of population above statutory pensionable age receiving pension (Percent)
SP2: Universal health coverage (UHC) service coverage (Index)
SP3: Proportion of urban population living in slums (Percent)

8.4 Data gaps in indicators by dimension and region

Table 21. .Data gaps in indicators by dimension and across all indicators

Country	Regional Rank	Missing Indicators in each Dimension				Missing across all indicators	
		Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social Inclusion	Number	percent
AFRICA							
Gabon	1	2	0	3	1	6	13%
Mauritius	2	1	0	1	0	2	4%
Seychelles	3	3	0	5	1	9	19%
Togo	4	0	0	3	0	3	6%
Cabo Verde	5	2	0	3	1	6	13%
Namibia	6	0	0	2	0	2	4%
Cote d'Ivoire	7	1	0	4	0	5	10%
Gambia	8	1	0	3	0	4	8%
Burkina Faso	9	1	1	2	0	4	8%
Zambia	10	1	1	0	0	2	4%
Guinea	11	0	0	2	0	2	4%
Tanzania	12	2	0	2	0	4	8%
Cameroon	13	0	0	1	0	1	2%
South Africa	14	0	0	0	0	0	0%
Benin	15	0	0	2	0	2	4%
Uganda	16	1	1	1	0	3	6%
Botswana	17	2	1	1	0	4	8%
Lesotho	18	1	1	3	1	6	13%
Senegal	19	0	0	1	0	1	2%
Zimbabwe	20	1	1	0	0	2	4%
Malawi	21	1	1	4	0	6	13%
Kenya	22	0	0	1	0	1	2%
Burundi	23	1	1	2	1	5	10%
Ethiopia	24	1	1	1	0	3	6%
Mali	25	1	1	4	0	6	13%
Rwanda	26	1	1	1	0	3	6%
Mozambique	27	0	0	2	1	3	6%
Ghana	28	0	0	1	0	1	2%
Morocco	29	0	0	1	0	1	2%
Tunisia	30	1	0	1	0	2	4%
Sierra Leone	31	0	0	3	0	3	6%
Mauritania	32	2	0	3	0	5	10%
Nigeria	33	0	0	1	0	1	2%
Central African Republic	34	2	1	5	1	9	19%
Algeria	35	1	0	2	0	3	6%
Angola	36	0	0	2	0	2	4%
Madagascar	37	0	0	1	0	1	2%
Egypt	38	2	0	0	0	2	4%
Niger	39	1	1	3	0	5	10%

Table 21. Data gaps in indicators by dimension and across all indicators *(continued)*

Country	Regional Rank	Missing Indicators in each Dimension				Missing across all indicators	
		Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social Inclusion	Number	percent
Sudan	40	1	0	4	0	5	10%
Libya	41	2	0	3	3	8	17%
British Indian Ocean Territory	-	12	9	12	12	45	94%
Chad	-	2	1	6	0	9	19%
Comoros	-	0	0	5	0	5	10%
Congo Republic	-	2	0	6	0	8	17%
Djibouti	-	2	0	7	0	9	19%
DR Congo	-	3	0	6	0	9	19%
Equatorial Guinea	-	3	0	9	4	16	33%
Eritrea	-	3	0	6	5	14	29%
Eswatini	-	3	1	4	0	8	17%
French Southern Territories	-	12	10	12	12	46	96%
Guinea-Bissau	-	0	0	6	1	7	15%
Liberia	-	1	0	6	0	7	15%
Mayotte	-	10	9	11	10	40	83%
Reunion	-	8	9	10	9	36	75%
Sao Tome and Principe	-	0	0	7	2	9	19%
Somalia	-	1	0	8	1	10	21%
South Sudan	-	3	2	8	1	14	29%
St. Helena	-	11	9	12	10	42	88%
Western Sahara	-	12	9	12	11	44	92%
THE AMERICAS							
United States	1	2	0	4	0	6	13%
Paraguay	2	1	1	0	0	2	4%
Brazil	3	1	0	0	0	1	2%
Chile	4	0	0	0	0	0	0%
Uruguay	5	0	0	0	0	0	0%
Costa Rica	6	0	0	0	0	0	0%
Panama	7	0	0	0	0	0	0%
Canada	8	0	0	2	0	2	4%
Jamaica	9	0	0	1	0	1	2%
Mexico	10	0	0	0	0	0	0%
El Salvador	11	0	0	1	0	1	2%
Bolivia	12	2	1	3	0	6	13%
Venezuela	13	2	0	5	0	7	15%
Suriname	14	1	0	4	1	6	13%
Colombia	15	0	0	0	0	0	0%
Nicaragua	16	0	0	1	0	1	2%
Argentina	17	0	0	0	0	0	0%
Dominican Republic	18	1	0	0	0	1	2%
Ecuador	19	0	0	0	0	0	0%
Peru	20	0	0	0	0	0	0%

Table 21. Data gaps in indicators by dimension and across all indicators *(continued)*

Country	Regional Rank	Missing Indicators in each Dimension				Missing across all indicators	
		Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social Inclusion	Number	percent
Guatemala	21	0	0	1	0	1	2%
Honduras	22	0	0	2	0	2	4%
Guyana	23	0	0	4	1	5	10%
Belize	24	1	0	4	0	5	10%
Trinidad and Tobago	25	1	0	3	0	4	8%
Barbados	26	2	1	4	3	10	21%
Anguilla	-	9	8	10	9	36	75%
Antigua and Barbuda	-	2	0	7	4	13	27%
Aruba	-	8	6	9	7	30	63%
Bahamas	-	3	0	5	5	13	27%
Bermuda	-	6	4	9	7	26	54%
Bonaire, Saint Eustatius and Saba	-	11	10	11	11	43	90%
Bouvet Island	-	12	10	12	12	46	96%
British Virgin Islands	-	8	5	10	8	31	65%
Cayman Islands	-	7	6	11	8	32	67%
Cuba	-	1	0	6	4	11	23%
Curacao	-	9	5	11	8	33	69%
Dominica	-	2	1	7	4	14	29%
Falkland Islands	-	10	8	11	11	40	83%
French Guiana	-	9	8	10	10	37	77%
Greenland	-	8	4	9	9	30	63%
Grenada	-	2	0	7	4	13	27%
Guadeloupe	-	9	9	10	10	38	79%
Haiti	-	0	0	5	0	5	10%
Martinique	-	9	9	11	9	38	79%
Montserrat	-	9	9	10	11	39	81%
Puerto Rico	-	3	4	8	6	21	44%
Saint-Martin	-	12	5	11	9	37	77%
Sint Maarten	-	9	7	12	8	36	75%
South Georgia and South Sandwich Is.	-	12	10	12	12	46	96%
St. Barths	-	12	9	11	11	43	90%
St. Kitts and Nevis	-	4	0	8	5	17	35%
St. Lucia	-	4	0	8	2	14	29%
St. Pierre and Miquelon	-	11	8	12	10	41	85%
St. Vincent and the Grenadines	-	4	0	8	3	15	31%
Turks and Caicos Islands	-	7	6	10	8	31	65%
United States Virgin Islands	-	10	4	10	8	32	67%
ASIA							
Japan	1	1	0	2	0	3	6%
Laos	2	2	1	4	0	7	15%

Table 21. Data gaps in indicators by dimension and across all indicators *(continued)*

Country	Regional Rank	Missing Indicators in each Dimension				Missing across all indicators	
		Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social Inclusion	Number	percent
Georgia	3	0	0	1	0	1	2%
China	4	1	0	0	1	2	4%
Thailand	5	0	0	0	0	0	0%
Bhutan	6	1	1	3	1	6	13%
Malaysia	7	0	0	0	0	0	0%
Philippines	8	0	0	0	0	0	0%
Vietnam	9	0	0	1	0	1	2%
Cyprus	10	0	0	2	0	2	4%
Indonesia	11	0	0	1	1	2	4%
Maldives	12	3	0	4	1	8	17%
Armenia	13	1	1	1	0	3	6%
South Korea	14	2	0	2	1	5	10%
Kyrgyz Republic	15	2	1	1	0	4	8%
Israel	16	1	0	2	0	3	6%
Azerbaijan	17	1	2	0	0	3	6%
Kazakhstan	18	1	1	0	0	2	4%
Nepal	19	1	1	1	0	3	6%
United Arab Emirates	20	1	0	2	0	3	6%
Brunei Darussalam	21	3	0	2	3	8	17%
Singapore	22	3	0	1	2	6	13%
Cambodia	23	0	0	1	1	2	4%
Tajikistan	24	1	2	0	0	3	6%
Qatar	25	2	0	1	3	6	13%
Myanmar	26	0	0	1	0	1	2%
Mongolia	27	1	1	0	0	2	4%
Sri Lanka	28	0	0	0	0	0	0%
Bangladesh	29	0	0	0	0	0	0%
Timor-Leste	30	2	0	4	1	7	15%
India	31	0	0	1	0	1	2%
Palestine	32	5	5	5	3	18	38%
Jordan	33	1	0	1	0	2	4%
Oman	34	0	0	1	2	3	6%
Lebanon	35	1	0	2	0	3	6%
Saudi Arabia	36	1	0	2	1	4	8%
Afghanistan	37	1	2	5	1	9	19%
Iran	38	1	0	4	0	5	10%
Kuwait	39	0	1	2	2	5	10%
Uzbekistan	40	1	1	3	2	7	15%
Iraq	41	0	0	3	0	3	6%
Pakistan	42	0	0	1	0	1	2%
Bahrain	43	1	1	2	4	8	17%
Yemen	44	2	0	3	0	5	10%
Hong Kong	-	6	8	7	4	25	52%

Table 21. Data gaps in indicators by dimension and across all indicators *(continued)*

Country	Regional Rank	Missing Indicators in each Dimension				Missing across all indicators	
		Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social Inclusion	Number	percent
Macau	-	9	9	10	6	34	71%
North Korea	-	5	1	9	6	21	44%
Syria	-	3	0	5	1	9	19%
Turkey	-	11	3	8	10	32	67%
Turkmenistan	-	2	1	7	2	12	25%
Taiwan	-	11	9	8	11	39	81%
EUROPE							
Switzerland	1	1	1	2	0	4	8%
Denmark	2	0	0	2	0	2	4%
Austria	3	1	1	2	0	4	8%
Germany	4	0	0	2	0	2	4%
Czech republic	5	2	1	4	0	7	15%
Sweden	6	0	0	2	0	2	4%
Slovakia	7	2	1	2	0	5	10%
Finland	8	0	0	2	0	2	4%
United Kingdom	9	0	0	4	0	4	8%
Belarus	10	3	1	3	1	8	17%
Italy	11	0	0	3	0	3	6%
Hungary	12	1	1	2	0	4	8%
France	13	0	0	2	0	2	4%
Netherlands	14	0	0	4	0	4	8%
Estonia	15	0	0	2	0	2	4%
Slovenia	16	0	0	2	0	2	4%
Norway	17	0	0	2	0	2	4%
Lithuania	18	0	0	2	0	2	4%
Portugal	19	0	0	2	0	2	4%
Croatia	20	0	0	2	0	2	4%
Latvia	21	0	0	2	0	2	4%
Luxembourg	22	1	1	2	0	4	8%
Albania	23	1	1	1	0	3	6%
Spain	24	0	0	2	0	2	4%
Poland	25	0	0	2	0	2	4%
Belgium	26	0	0	2	0	2	4%
Romania	27	1	0	2	0	3	6%
Bulgaria	28	0	0	2	0	2	4%
Bosnia and Herzegovina	29	2	0	3	0	5	10%
Macedonia	30	1	1	4	0	6	13%
Serbia	31	1	1	2	0	4	8%
Greece	32	0	0	2	0	2	4%
Russia	33	1	0	3	0	4	8%
Moldova	34	1	1	4	0	6	13%
Ukraine	35	1	0	1	0	2	4%
Ireland	36	0	0	2	0	2	4%

Table 21. Data gaps in indicators by dimension and across all indicators *(continued)*

Country	Regional Rank	Missing Indicators in each Dimension				Missing across all indicators	
		Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social Inclusion	Number	percent
Iceland	37	0	0	3	0	3	6%
Malta	38	0	1	3	0	4	8%
Montenegro	39	1	0	3	0	4	8%
Aland Islands	-	12	11	12	12	47	98%
Andorra	-	7	1	9	6	23	48%
Faeroe Islands	-	6	6	10	10	32	67%
Gibraltar	-	10	5	11	9	35	73%
Guernsey	-	11	9	12	11	43	90%
Isle of Man	-	11	7	12	10	40	83%
Jersey	-	11	9	12	12	44	92%
Liechtenstein	-	8	4	9	7	28	58%
Monaco	-	10	4	10	6	30	63%
San Marino	-	10	6	10	6	32	67%
Svalbard and Jan Mayen Islands	-	12	9	12	12	45	94%
Vatican	-	12	10	11	12	45	94%
OCEANIA							
New Zealand	1	0	0	2	1	3	6%
Fiji	2	1	1	4	1	7	15%
Australia	3	1	0	2	0	3	6%
Papua New Guinea	4	2	0	5	1	8	17%
American Samoa	-	10	3	11	11	35	73%
Christmas Island	-	12	9	12	12	45	94%
Cocos (Keeling) Islands	-	12	9	12	12	45	94%
Cook Islands	-	6	8	11	8	33	69%
French Polynesia	-	3	5	9	7	24	50%
Guam	-	10	4	11	9	34	71%
Heard and McDonald Islands	-	12	10	12	12	46	96%
Kiribati	-	4	2	8	2	16	33%
Marshall Islands	-	6	0	8	3	17	35%
Micronesia, Fed. Sts.	-	5	1	9	4	19	40%
Nauru	-	5	0	11	4	20	42%
New Caledonia	-	4	5	8	6	23	48%
Niue	-	8	7	11	8	34	71%
Norfolk Island	-	12	9	12	12	45	94%
Northern Mariana Islands	-	10	5	12	8	35	73%
Palau	-	7	0	8	4	19	40%
Pitcairn	-	12	9	12	12	45	94%
Samoa	-	3	0	6	1	10	21%
Solomon Islands	-	3	0	6	1	10	21%
Tokelau	-	11	7	11	11	40	83%
Tonga	-	3	0	5	3	11	23%
Tuvalu	-	5	2	8	4	19	40%

Table 21. Data gaps in indicators by dimension and across all indicators *(continued)*

Country	Regional Rank	Missing Indicators in each Dimension				Missing across all indicators	
		Efficient and sustainable resource use	Natural capital protection	Green economic opportunities	Social Inclusion	Number	percent
United States Minor Outlying Islands	-	12	10	12	12	46	96%
Vanuatu	-	3	1	6	2	12	25%
Wallis and Futuna Islands	-	11	8	12	10	41	85%

Annex

Annex 1. **Summary of methods for the Green Growth Index**

A. Index Development Process

A.1 Iterative Approach

GGGI adopted a thorough process in designing the Green Growth Index through iterative activities, including expert consultations, assessment of expert feedback, and quality improvements. GGGI pursued two complementary strategies to enhance the relevance and practicality of the Index in policymaking:

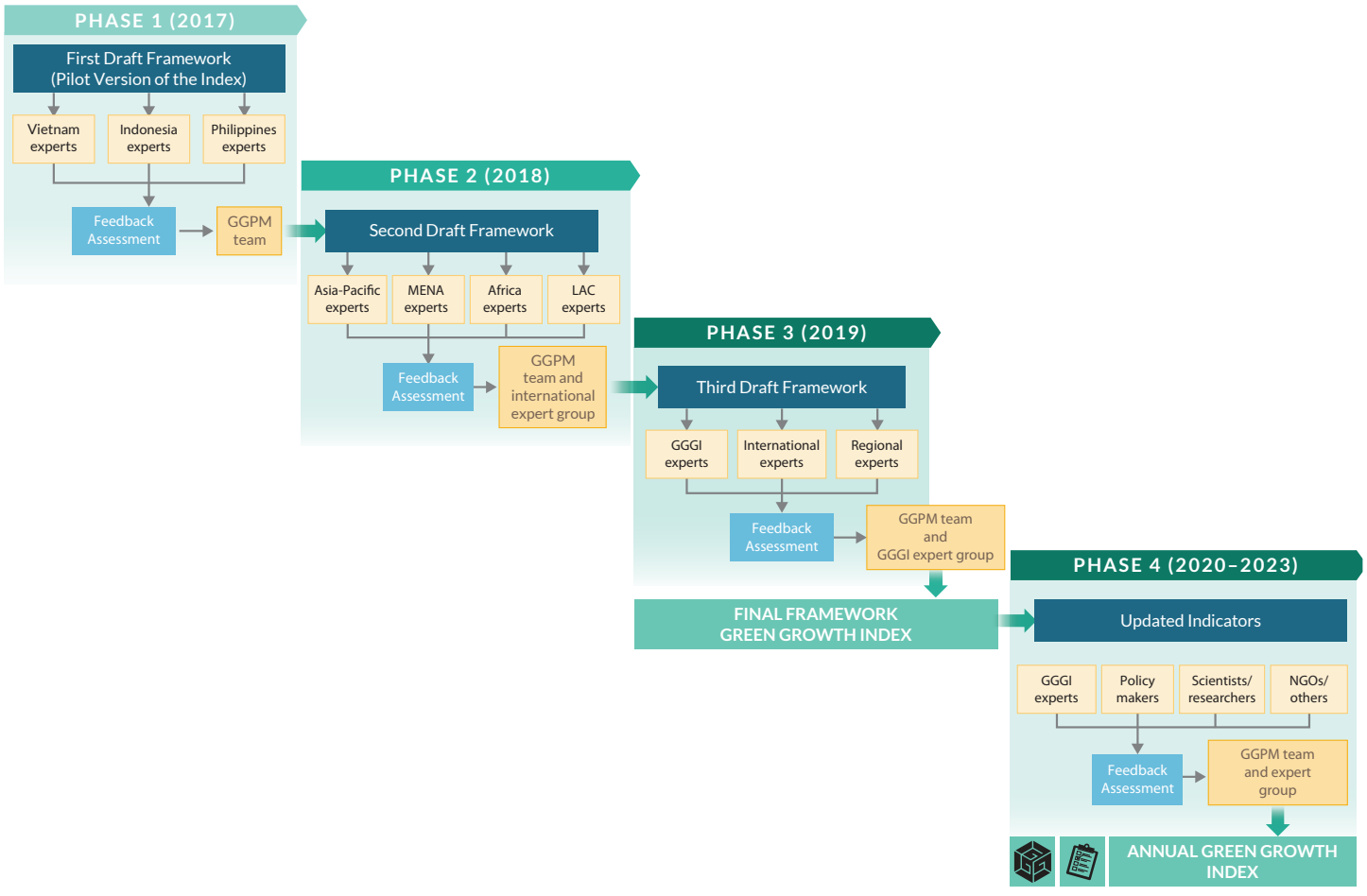
- A stepwise scientific approach through rigorous research to understand the complexity and multi-dimensionality of green growth and
- A consultative process involving experts and other stakeholders to determine the indicators' policy relevance in the national and regional contexts.

A.2 Participatory Approach

The stakeholder engagement process was initiated in 2016 and completed in early 2019. The four main phases included (Figure A1):

1. **Phase 1 – Pilot:** GGGI developed a pilot version of the Index covering 34 GGGI member and partner countries.[1] The Index was presented in an international expert workshop at GGGI headquarters in Seoul, South Korea, three in-country stakeholder workshops (in Vietnam, Indonesia, and the Philippines), and international stakeholder consultation during Global Green Growth Week 2017 in Addis Ababa, Ethiopia. These consultative activities aimed to inform GGGI member countries about the ongoing process of developing the Index and collect initial feedback.

Figure A1. Process for developing the framework of the Green Growth Index



a "Members" refer to countries that have submitted their instrument of accession to GGGI and formal membership has commenced while "partner countries" include countries where GGGI has operations and those that have formally communicated their intent to become a Member.

2. **Phase 2 – Regional Consultations:** GGGI presented the revised framework incorporating the preliminary feedback in 2018 in four regional consultation workshops for the Asia-Pacific Region (Bangkok), Middle East (Dubai), Africa (Addis Ababa), and Latin America and the Caribbean (Mexico City), as well as an international expert meeting in Geneva. These workshops served as a platform for dialogue and interaction among the stakeholders to ensure a transparent process for improving the Index. The outcomes of the workshops were presented during an international expert meeting in Rome, Italy.

3. **Phase 3 – Expert Consultations**: The last phase of the Index development process involved the circulation of the draft technical report on the concept, methods, and applications of the Index to the internal and external experts for their review and feedback. GGGI collected expert feedback through an online survey. GGGI also conducted two additional expert consultations—the first with GGGI thematic experts to align the Index to the priority areas of the Institute and the second with selected research institutions and international organizations[b] to validate the sustainability targets. These expert inputs from the online survey and consultations were used to finalize the Index.

4. **Phase 4 – Annual Expert Consultations:** The fourth phase of the Index development process is the expert consultations conducted yearly to continuously improve the indicators of the Green Growth Index. As discussed in Chapter 6 and as indicated in Table 6, missing green growth indicators will need to be included, and proxy variables will still need to be replaced with more relevant indicators when data becomes available in the coming years.

This year's annual expert consultation focused on selecting additional indicators for the green economic opportunities dimension. GGGI and GGKP collaborated in conducting a virtual workshop on the 12th of September 2023, which aimed to present the results of the online survey conducted before the workshop and validate the two top-rated green economic opportunities indicators. A detailed description of this year's consultations is discussed in Chapter 6.1 and Annex 5.

B. Analytical and Empirical Methods

B.1 Stepwise Analytical Approach

In building the Green Growth Index, GGGI applied a stepwise approach that conforms to "good practices" in developing composite indices[c] (Figure A2). A composite index combines several indicators into a single score, which facilitates the comparison, ranking, benchmarking, and monitoring of progress for multifaceted, complex phenomena.

The development of the Green Growth Index followed four key steps:

- **Concept building** entails defining the objectives of the Index, conceptualizing green growth, and identifying its dimensions and indicators;
- **Empirical application** requires addressing methodological issues such as indicator selection, data preparation (i.e., scaling, imputation, outliers, correlation), normalization, weights, and aggregation of indicators;
- **Robustness check** involves assessing the explanatory power of the Index through correlation analysis and changes in model inputs and its impacts on aggregation through sensitivity and uncertainty analyses; and
- **Presentation** focuses on communicating the results at the global, regional, and country scale using various diagrams and tables.

The Green Growth Index has various applications (Chapter 7), including the Global Green Growth Index (i.e., this report), Regional and National Green Growth Index, Green Recovery Index, and Green Growth Simulation Tool. The four key steps are applied in all applications of the Green Growth Index.

B.2 Empirical Steps

The Green Growth Index was constructed through the aggregation of the normalized indicators (metrics), indicator categories (pillars), and dimensions (goals) (Figure C). Before the aggregation, several steps were necessary to select, prepare, and validate the indicators included in constructing the Index:

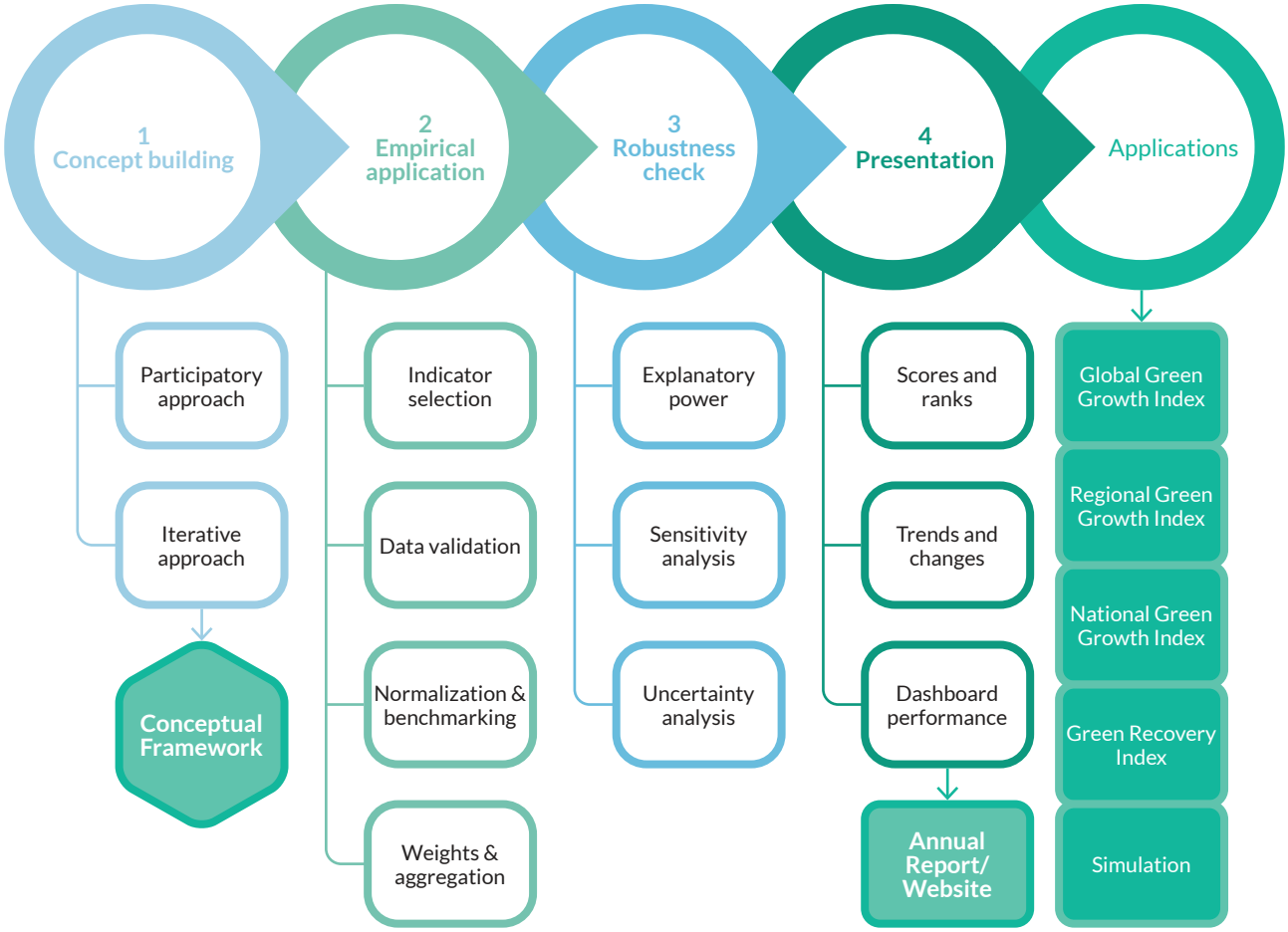
1. **Indicator selection:** Several criteria were applied in the selection of indicators, including the relevance of the data to the green growth dimensions based on conceptual and empirical evidence, coverage of more than 140 countries (including most GGGI member and partner countries); availability of time-series data to allow updates of the Index on a regular interval; accessibility of the data to ensure replication of methods and credibility of their sources; and acceptable level of association with other indicators in the same dimension. In a few cases, however, the criteria for country coverage and time-series data were waived due to a significant lack of data. All data were collected from online sources, mainly published in the UNSTATS SDG database and databases from other international organizations (e.g., FAO, World Bank, WIPO, UN COMTRADE, etc.).

2. **Data preparation:** Scaling and imputation are the most important methods to prepare the data and improve the comparability of the indicators. Scaling the data with an appropriate denominator (e.g., GDP, land area, etc.)

b IASS, PIK, FAO, SDSN and OECD.

c Nardo, M., Saisana, M., Saltelli, A., & Tarantola, S. (2005). Tools for Composite Indicators Building. Ispra, Italy: European Commission Joint Research Centre: Institute for the Protection and Security of the Citizen Econometrics and Statistical Support to Antifraud Unit; OECD & JRC 2008, op. cit.

Figure A2. Stepwise approach for developing the Green Growth Index



allows an objective comparison across small and large countries. All indicators' available data were scaled except for the GHG emissions, export of environmental goods, and environmental technology patents. Imputing data based on the available time-series data helps improve the country coverage of the indicators. To minimize the effects of imputation on data uncertainty, the simple method of imputing data from the closest years was applied.

3. **Data validation:** The most important method to validate the statistical appropriateness of the indicator data is to check for outliers and correlation. Since outliers can distort the indicators' statistical properties and normalized values,[d] their values were capped using lower or upper fences based on the interquartile range from 75th and 25th percentiles. The correlation analysis aims to identify redundant indicators with a robust correlation to improve the explanatory power of the indicators and verify whether indicators have acceptable levels of association in their respective dimensions. Indicators with strong correlations were excluded from the framework and replaced with ones with acceptable association levels.

4. **Indicator weights:** With 12 green growth indicators added to the green economic opportunities in this year's Green Growth Index, assigning weights to the indicators was unnecessary. Each pillar across four dimensions has an equal number of indicators, i.e., three.

5. **Indicator normalization:** It is necessary to apply a normalization method to translate the indicators with different units into a standard scale. Normalization allows the indicator values measured in different units to be adjusted to a single scale to make the data comparable across the indicators. The re-scaling method (min-max transformation) for normalization was applied for the following reasons: it is the simplest and most widely used method that will facilitate ease of comprehensibility and replication; the use of upper and lower bounds will reduce issues related to outliers; and the integration of the targets will allow benchmarking against sustainability targets.

As presented, the normalized indicators were used as inputs to the aggregation model (i.e., level 1). The two most common and straightforward aggregation methods include linear aggregation using arithmetic mean and geometric aggregation using geometric mean. These two methods have different underlying assumptions. Linear aggregation allows full and constant compensability, i.e., low values in

d Mishra, S. K. (2008). Construction of Composite Indices in Presence of Outliers. SSRN Electronic Journal, 1–5. https://doi.org/10.2139/ssrn.1137644; OECD & JRC 2008, op. cit.; Ibid.

one indicator can be traded off (substituted) by high values in another. On the other hand, geometric aggregation allows only partial compensability, limiting the ability of the indicators with very low scores to be fully compensated by indicators with high scores. The two methods were applied in the different aggregation models so that, as the level of aggregation increases, the level of substitutability decreases:

1. **Level 1:** Arithmetic mean was applied to linearly aggregate the normalized indicators, allowing compensability of the individual indicators in each indicator category. Moreover, at Level 1 of aggregation, countries with more than 25 percent missing values were dropped.

2. **Level 2:** Geometric aggregation was applied to the indicator categories to allow only partial compensability between indicators in each dimension. Like in Level 1, the 25 percent rule on missing values was applied to the dimensions with more than four indicator categories, i.e., resource efficiency and green economic opportunities.

3. **Level 3:** Geometric aggregation was applied to the dimensions, and the 25 percent rule on missing values was not used. At this aggregation level, no dimension could be easily substituted for the other dimensions to improve the Green Growth Index.

Python software was used to conduct all the analyses described above, except for the correlation analysis, which was done in Prism (GraphPad Software). Detailed discussion on constructing the Green Growth Index is provided in Chapter 5 of GGGI Technical Report Number 5, *Green Growth Index: Concepts, Methods, Applications* (Acosta et al. 2019a).[e]

C. Validating and Improving the Index

Composite indices often face criticism because they can be misleading if poorly constructed and interpreted.[f] Thus, the final critical step in developing a composite index is evaluating the confidence in the model and its underlying assumptions (i.e., robustness check).

Two different types of analyses were conducted to validate the robustness of the Green Growth Index:

- **Sensitivity analysis:** Using Monte Carlo analysis, the sensitivity of the Green Growth Index to changes in the input variables of the aggregation model at the indicator level was analyzed.

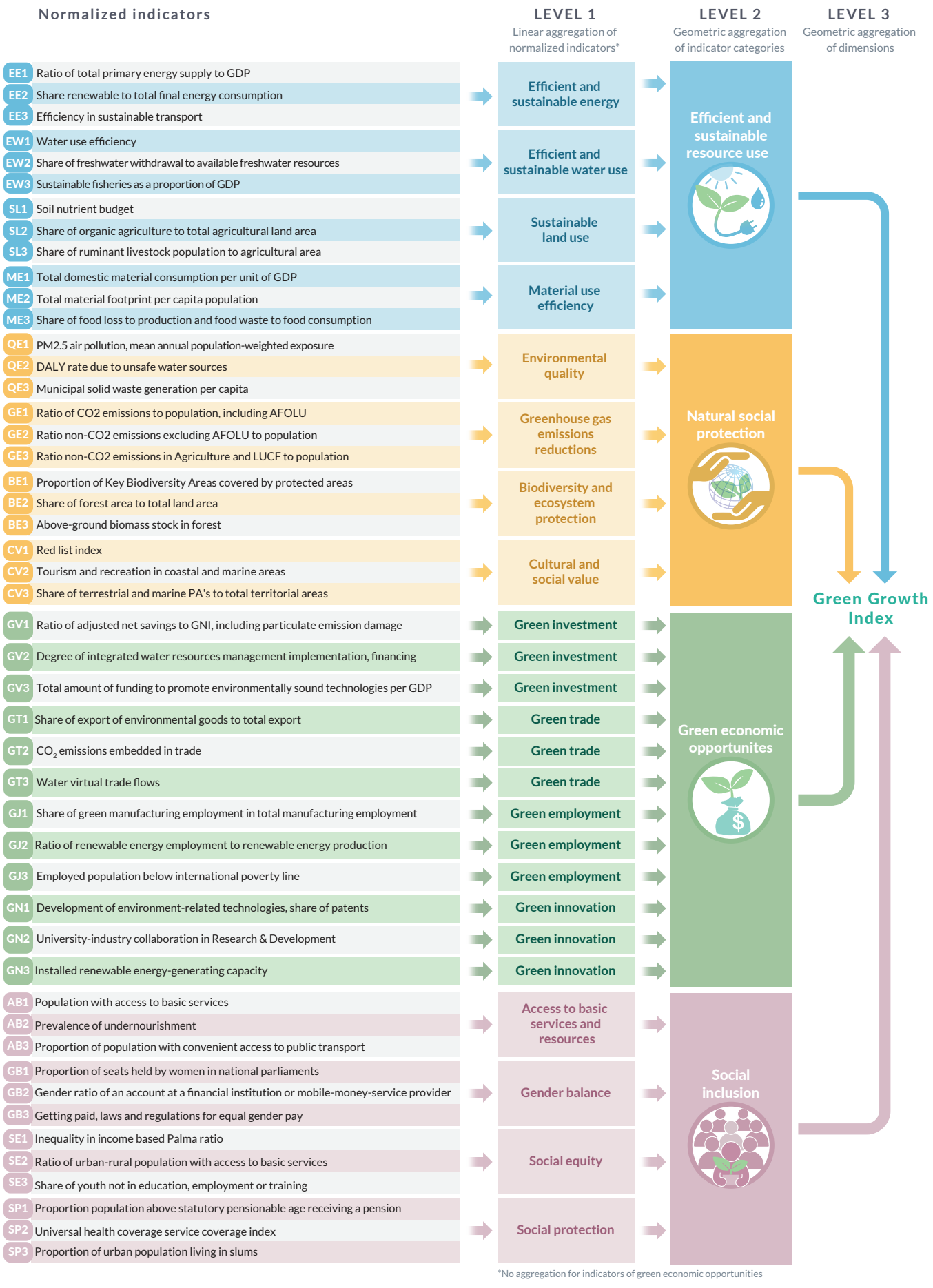
- **Explanatory power:** Using correlation and regressionanalyses, the ability of the indicators and their aggregated values (i.e., indicator categories, dimensions) to explain the structure of the Index at the pillar and dimension was analyzed.

The sensitivity analysis checks the impacts of changing the indicator values and missing indicator data on the Green Growth Index scores. This is critical to ensure the robustness of the scores because a few databases tend to change during annual updates by the publishers (Annex 2). The results from the regression models suggested that the dimensions, indicator categories, and indicators explain sufficient variation in the Green Growth Index. At the same time, the results from sensitivity analysis showed that the Green Growth Index is robust concerning changes in model inputs and assumptions. The results of the robustness check are discussed in Annex 3.

e https://greengrowthindex.gggi.org/wp-content/uploads/2019/12/Green-Growth-Index-Technical-Report_20191213.pdf

f Saisana, M., & Tarantola, S. (2002). State-of-the-art report on current methodologies and practices for composite indicator development. European Commission, pp. 1–72. https://doi.org/10.13140/RG.2.1.1505.1762

Figure A3. Methods of aggregation at the indicator, indicator category, and dimension levels



Annex 2. **Divergences in databases for selected green growth indicators in 2022 and 2023 Green Growth Index**

The raw data of all indicators for the 2023 and 2024 Green Growth Index were compared to identify any divergence that will affect the scores. Generally, there are divergences in the data reported in the online databases for these years. The diagrams below show indicators with significant divergences between databases for selected countries (Figure A.4). Overall, 23 indicators out of 48 represent data divergence for some countries. The data sources of indicators were the same except for AB3 and GT1 for the 2023 and 2024 Green Growth Index.

Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries

EE1: Energy intensity level of primary energy (MJ per $2011 PPP GDP)

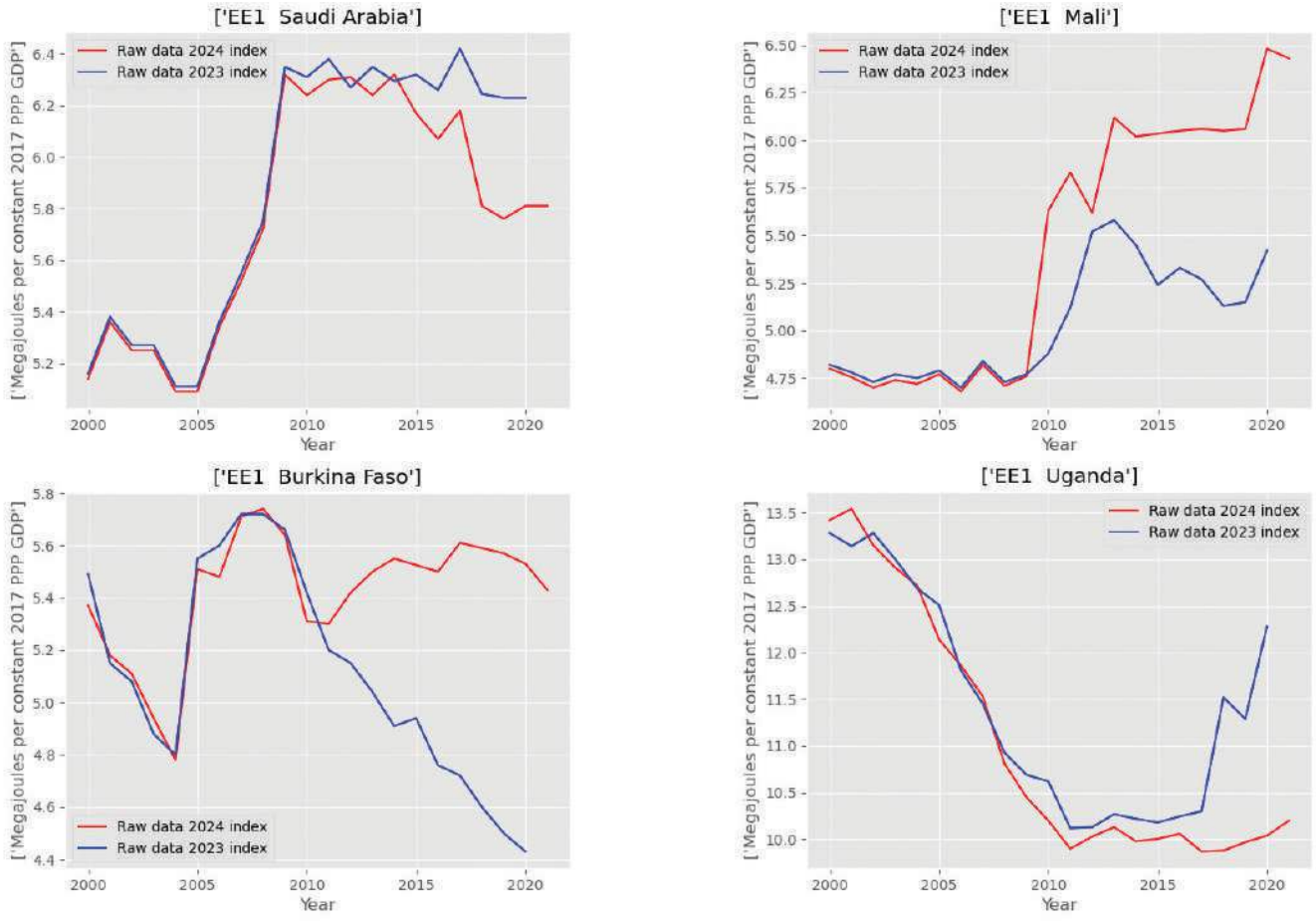
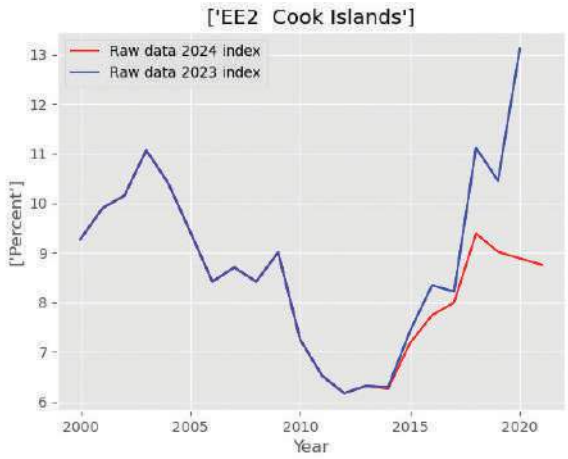
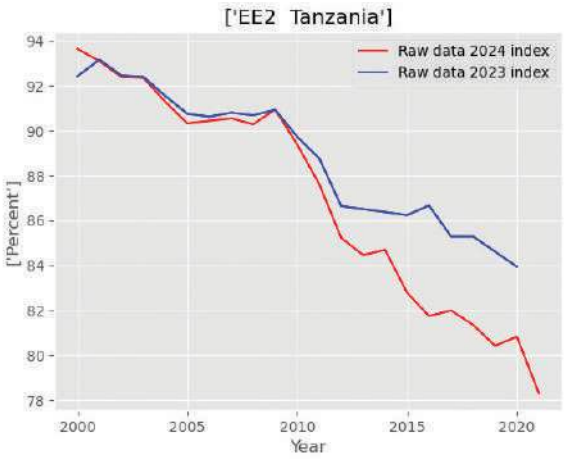
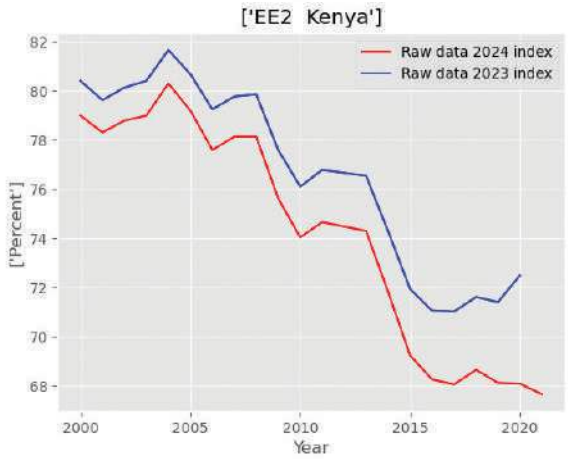


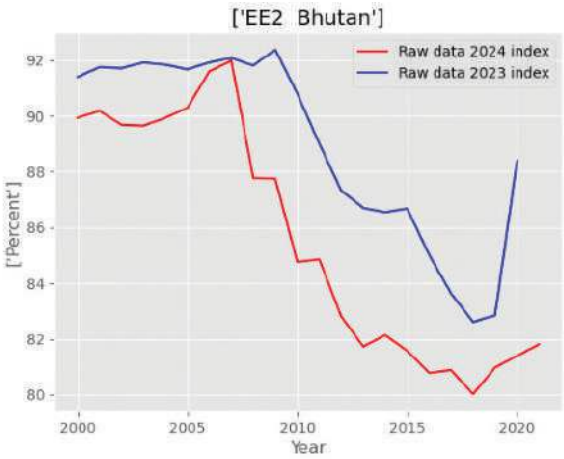
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

EE2: Share renewable to total final energy consumption (Percent)

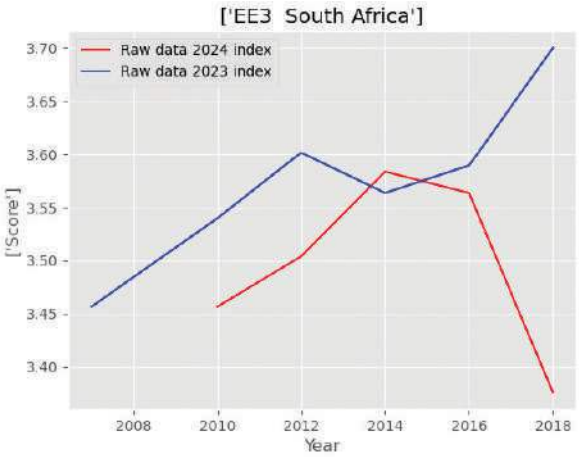


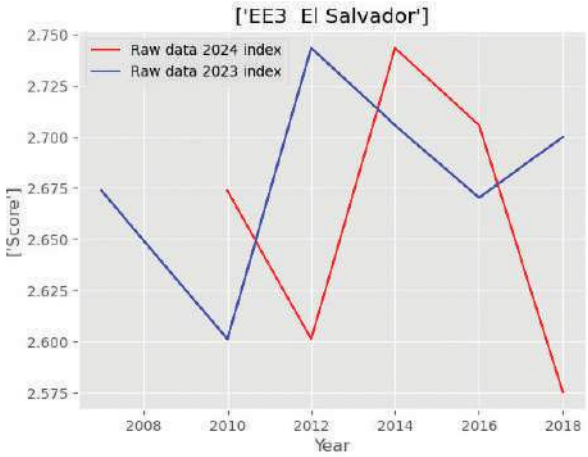


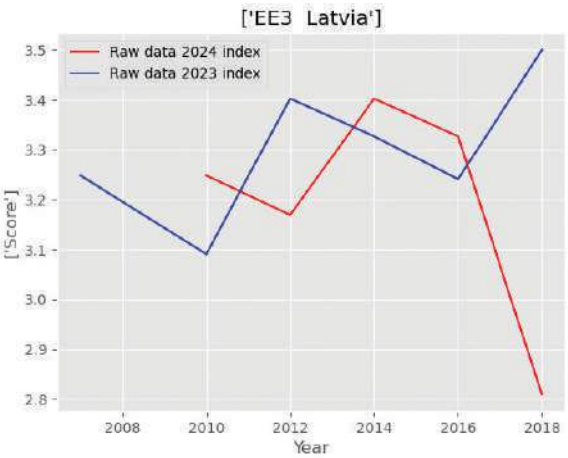




EE3: Efficiency in sustainable transport (Score)







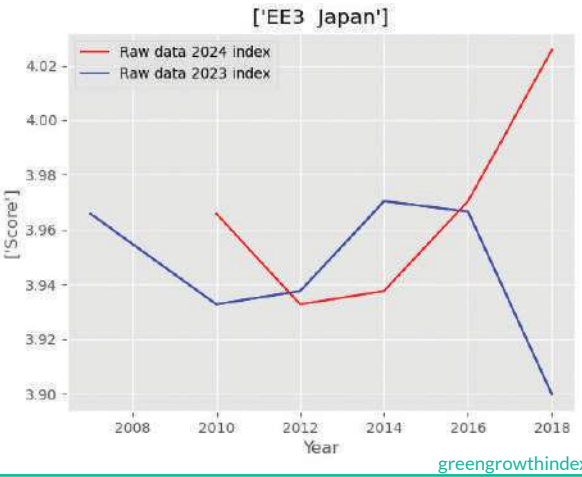
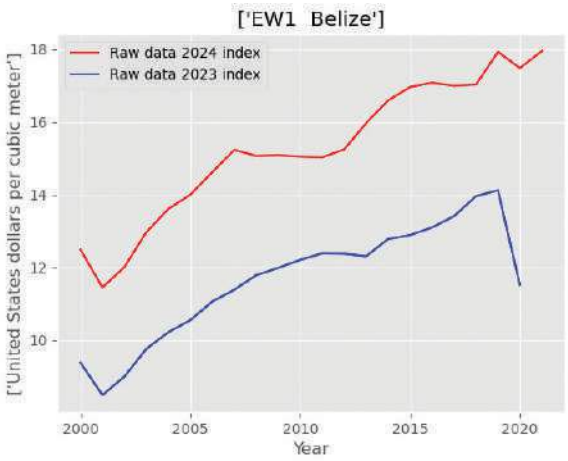
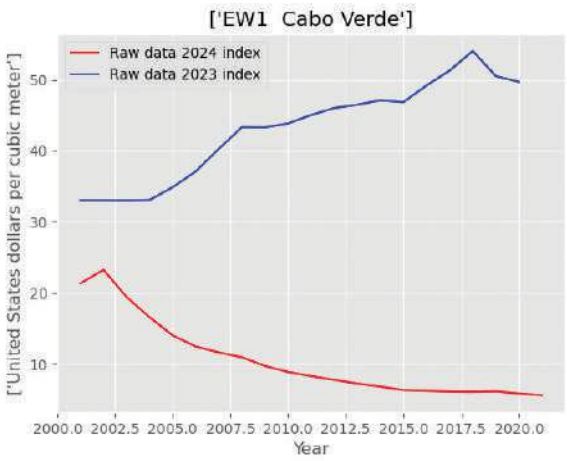


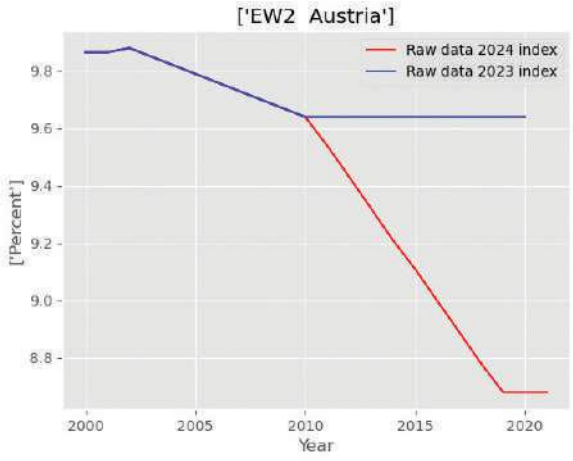
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

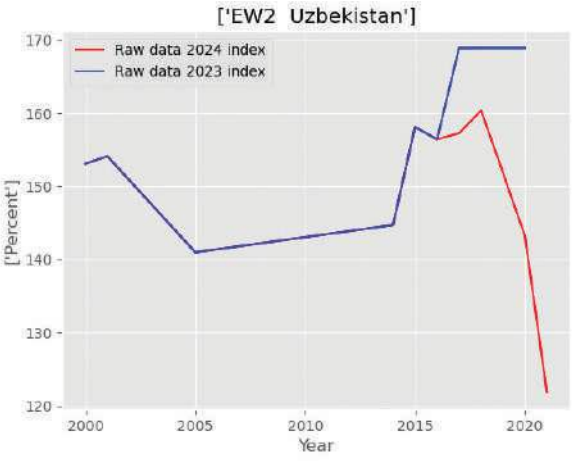
EW1: Water Use Efficiency (USD per m³)

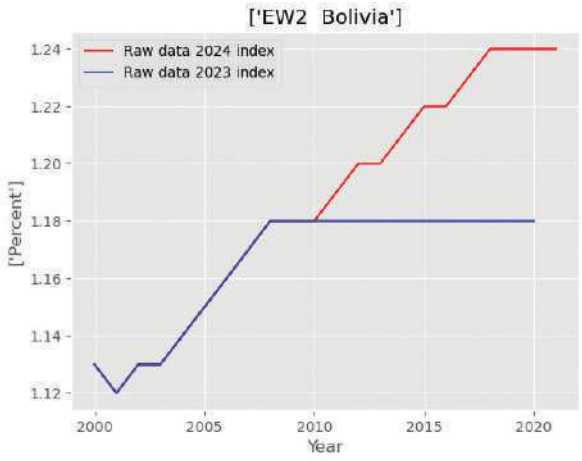




EW2: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (Percent)







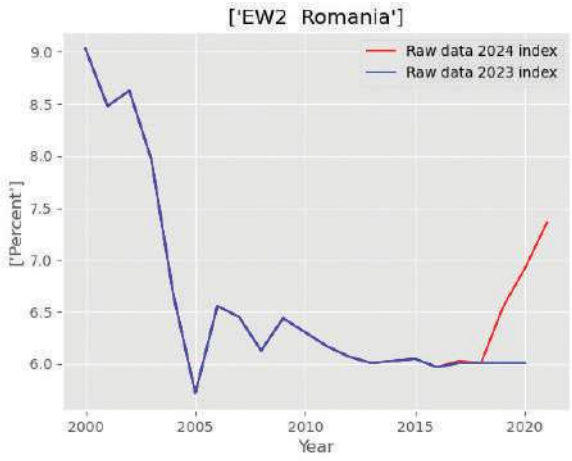
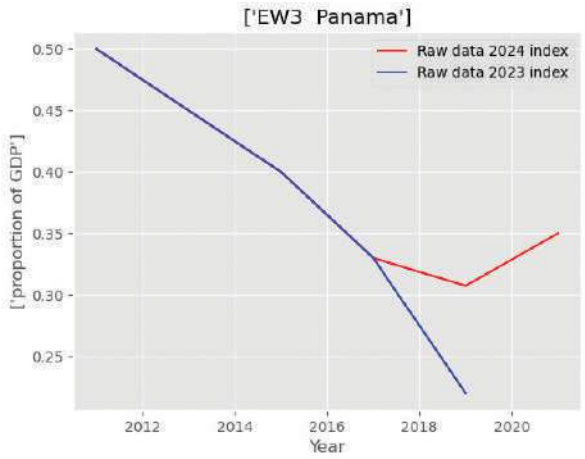
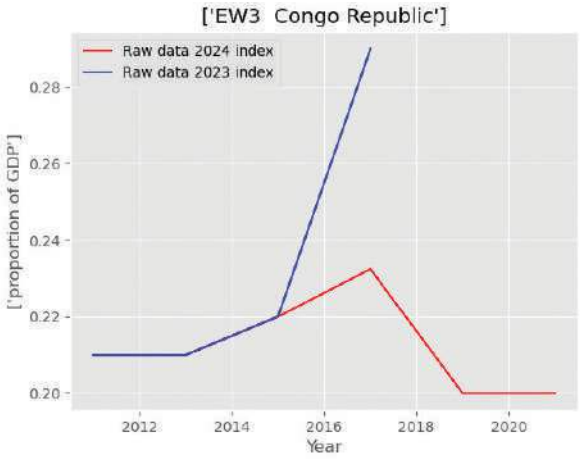


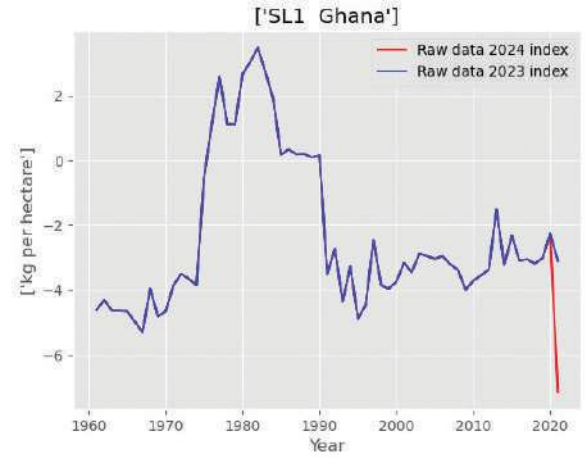
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

EW3: Sustainable fisheries as a proportion of GDP (Proportion of GDP)





SL1: Nutrient balance per unit area (Kg per hectare)



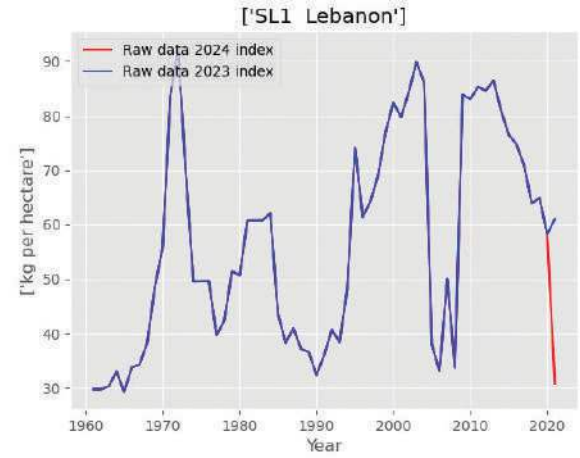
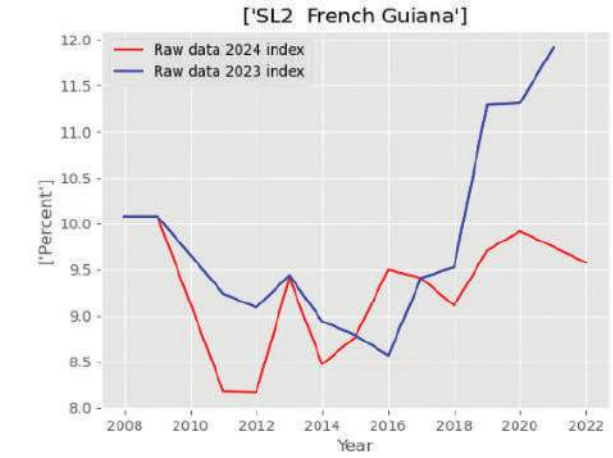
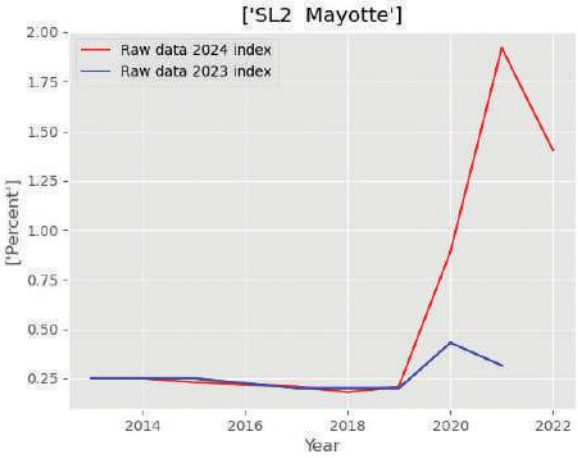
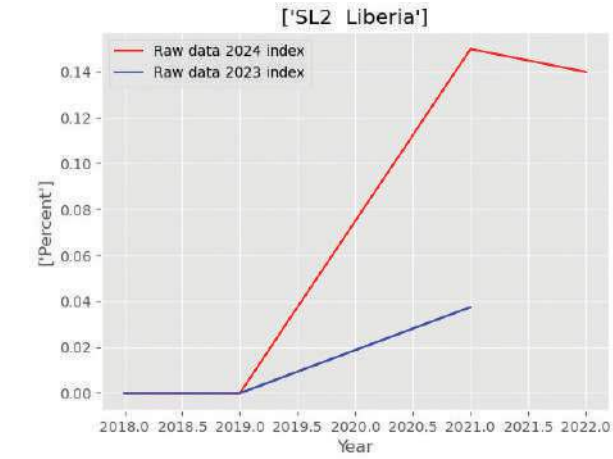


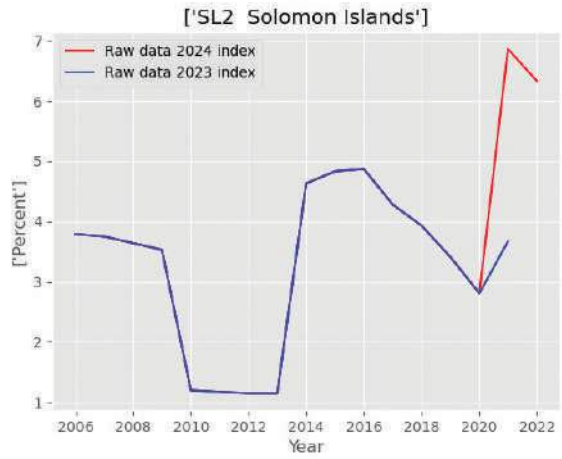
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

SL2: Share agriculture organic to total agriculture land area (Percent)

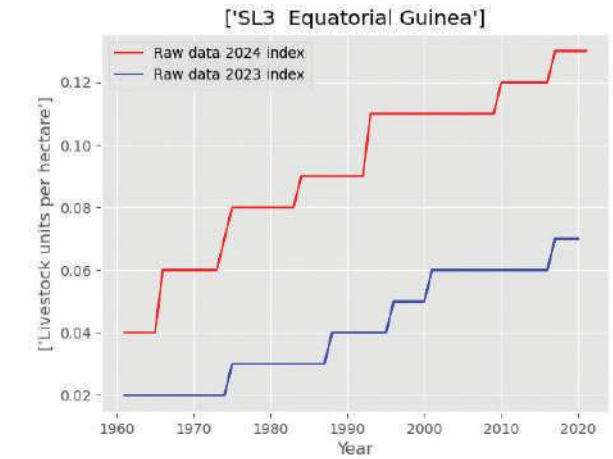


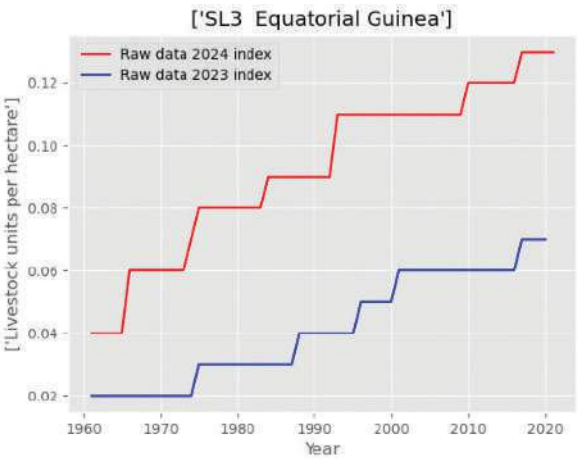


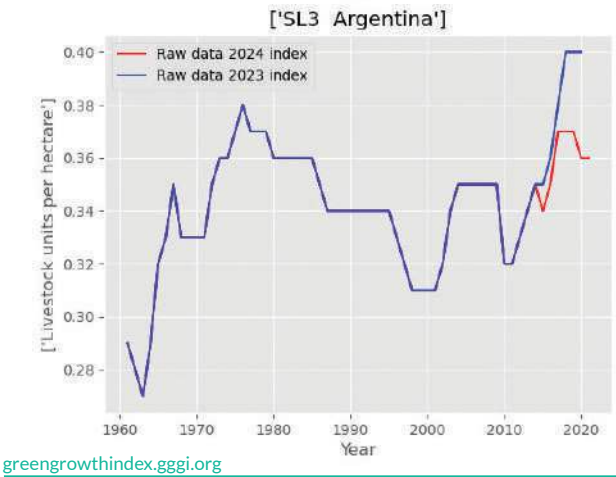




SL3: Share of ruminant livestock population to agricultural area (Livestock units per hectare)







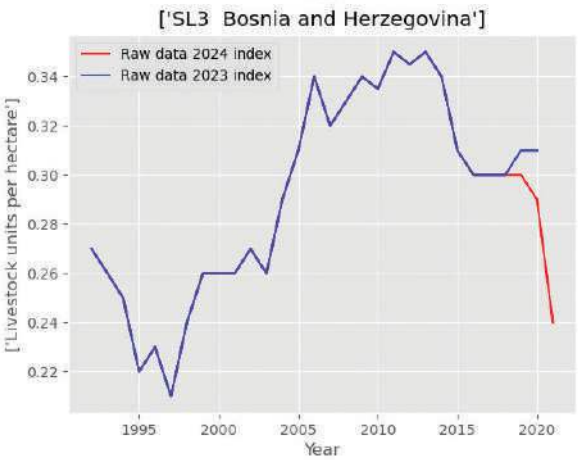
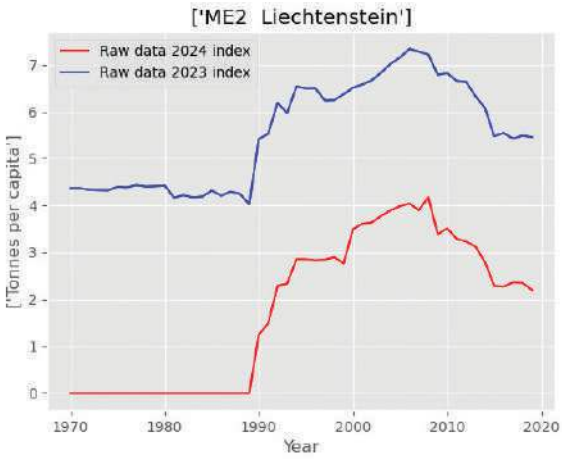
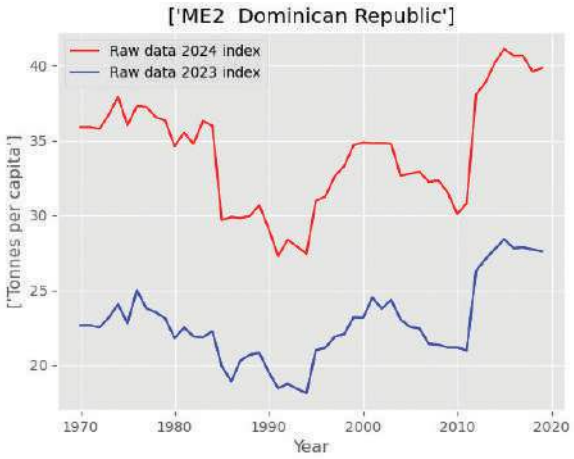


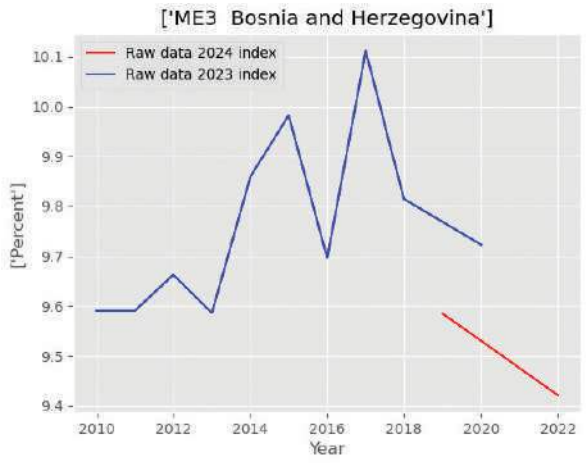
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

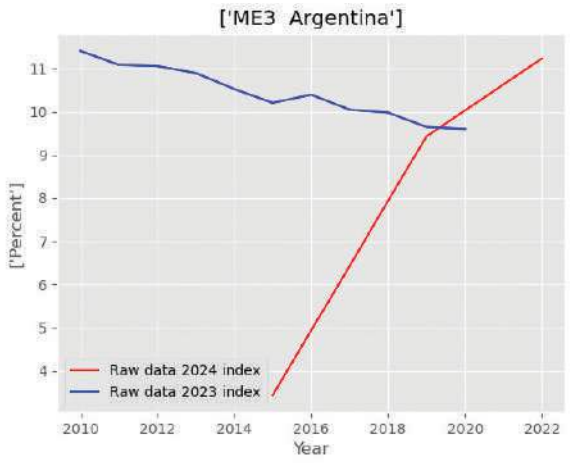
ME2: Total material footprint (MF) per capita (Tons per capita)

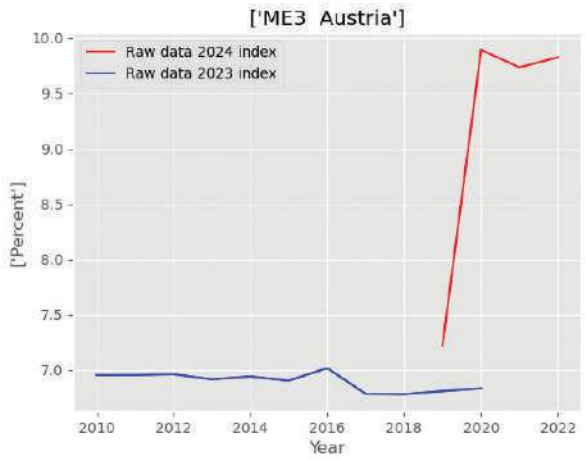




ME3: Average of food loss to production and food waste to consumption (Percent)







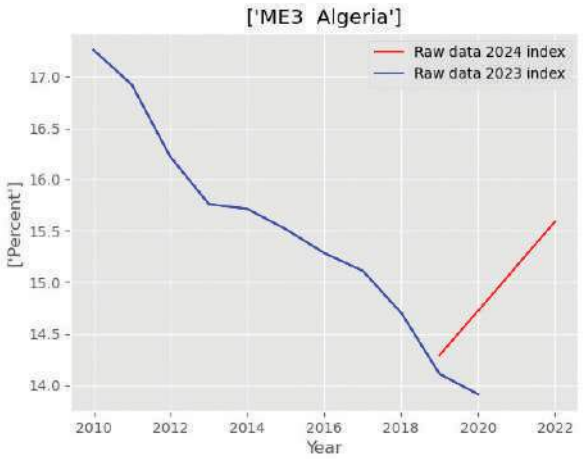
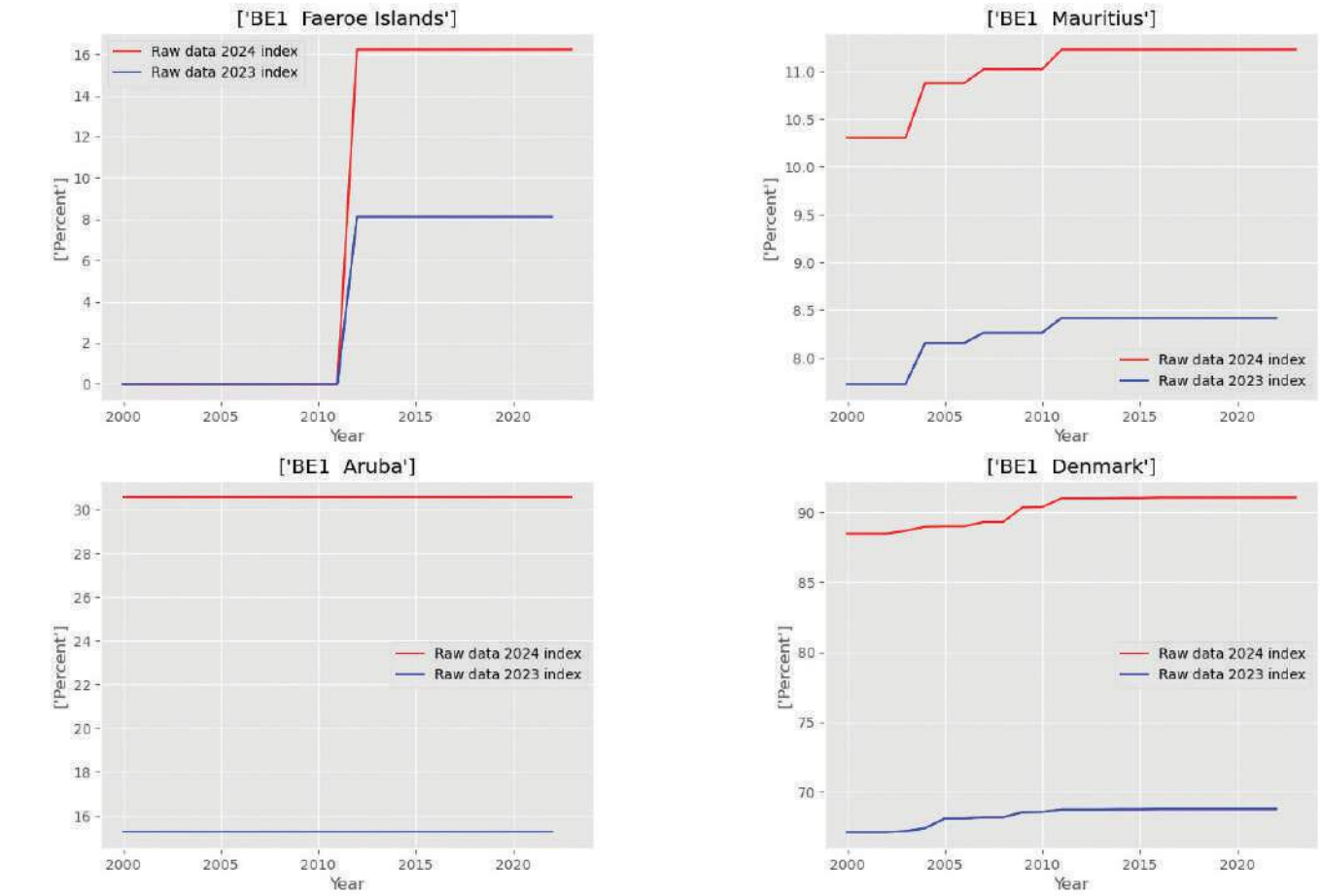


Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

BE1: PM2.5 air pollution, mean annual population-weighted exposure (Percent)



BE2: Share Forest area to total land area (Percent)

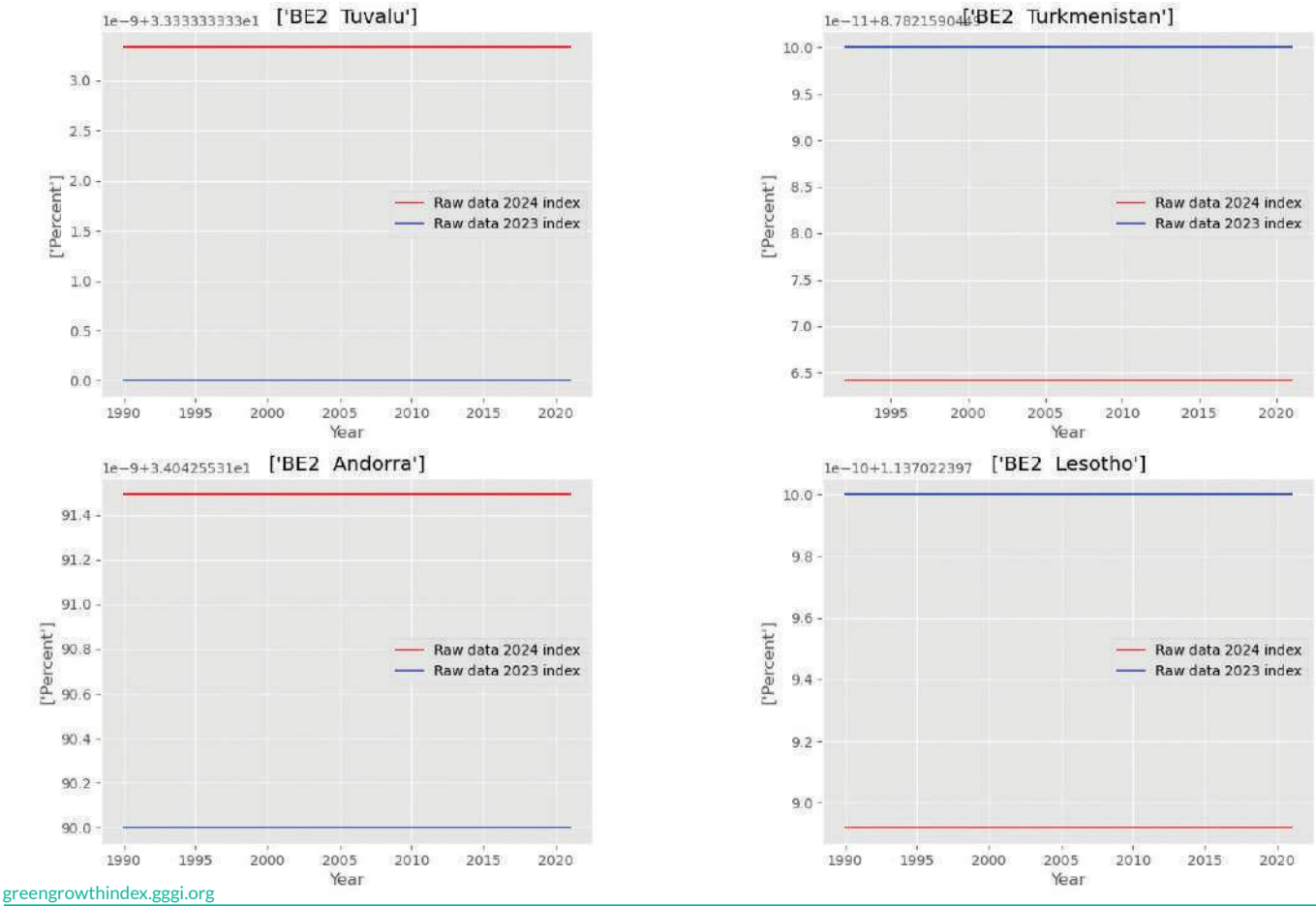
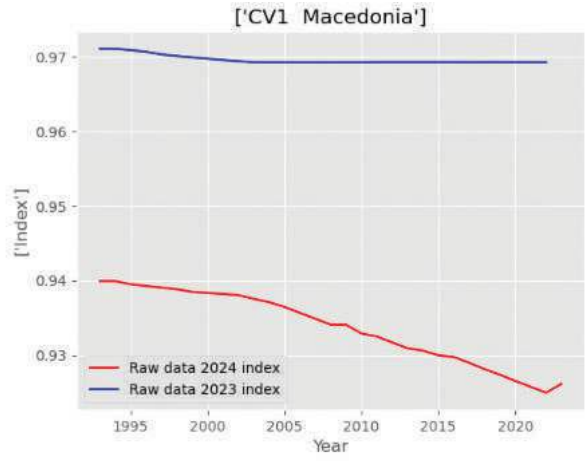
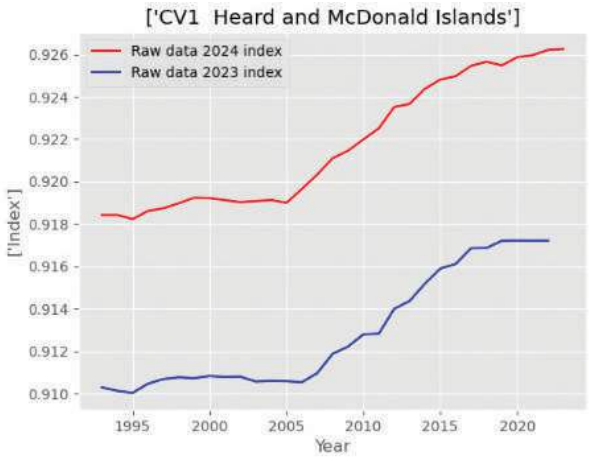
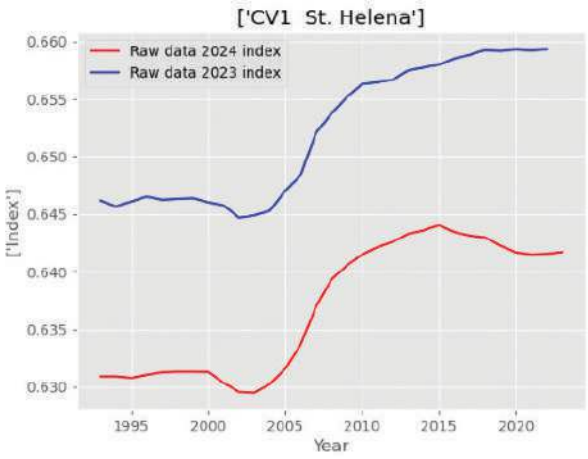


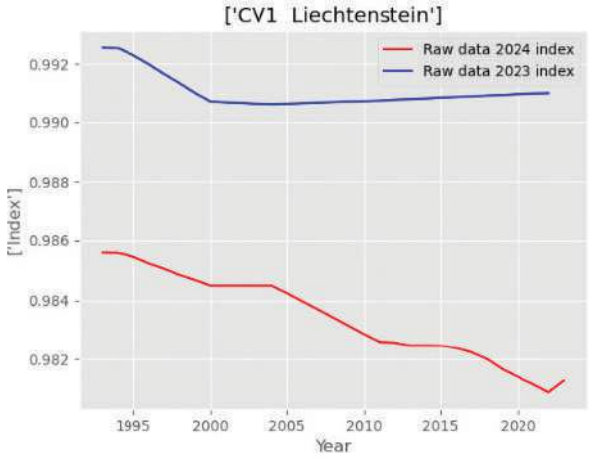
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

CV1: Red List Index (Score)

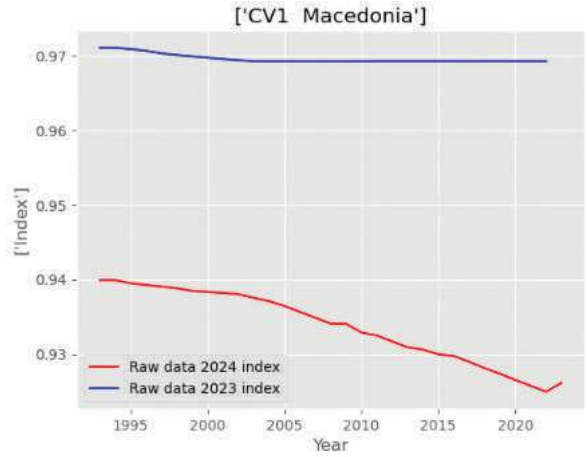








CV2: Tourism and recreation in coastal and marine areas (Score)



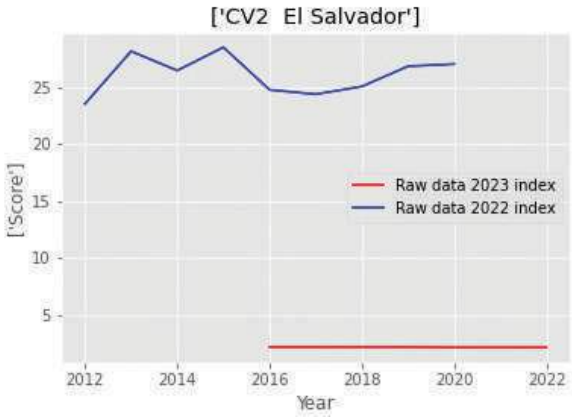
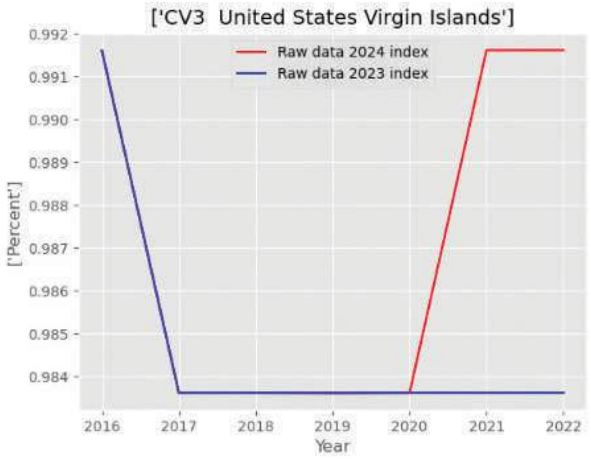
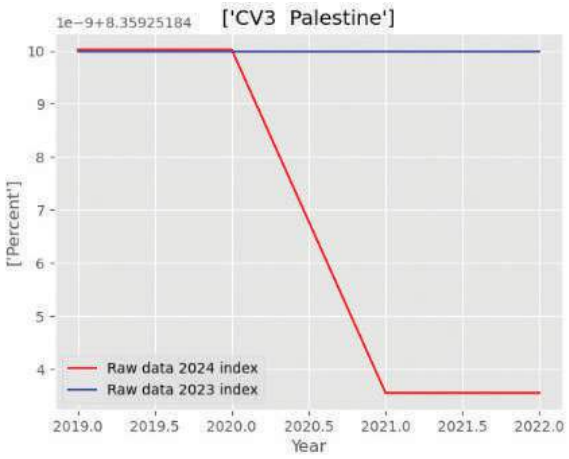


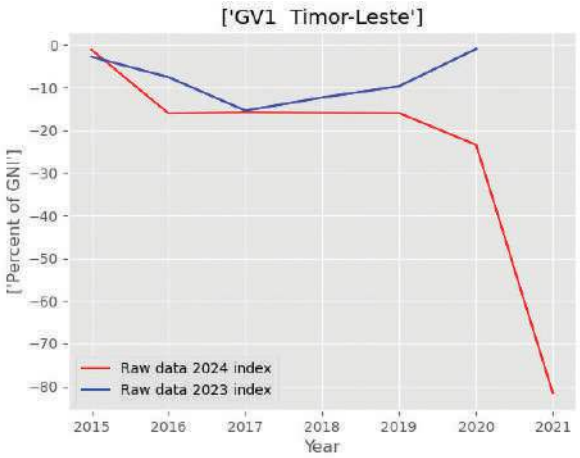
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

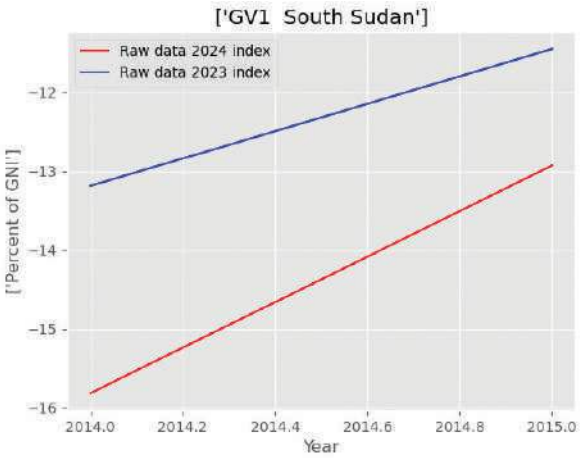
CV3: Share of terrestrial and marine protected areas to total territorial areas (Percent)



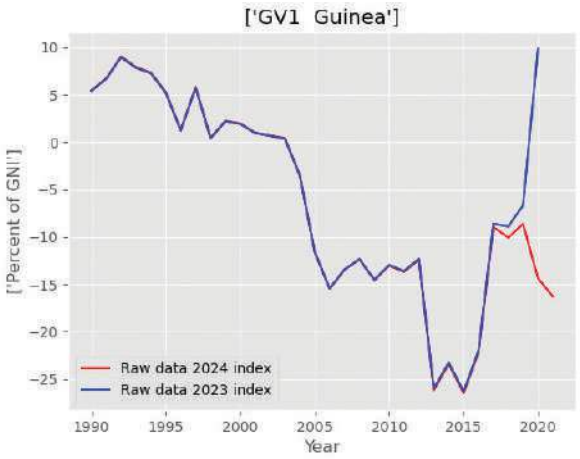


GV1: Adjusted net savings, including particulate emission damage (% of GNI))





GJ1: Share of green manufacturing employment in total manufacturing employment (Percent)



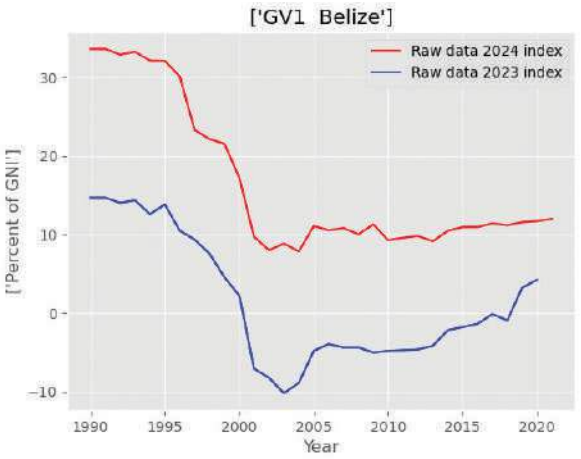
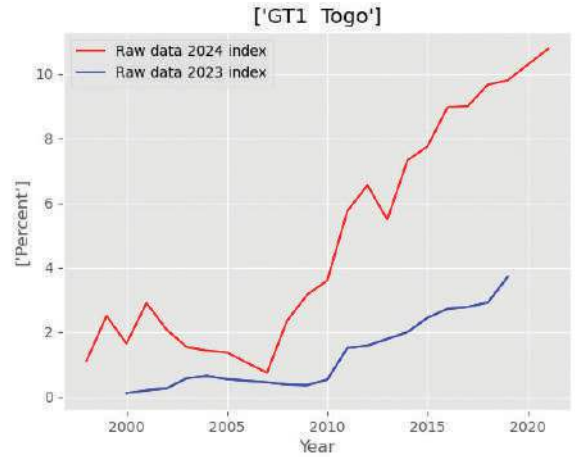
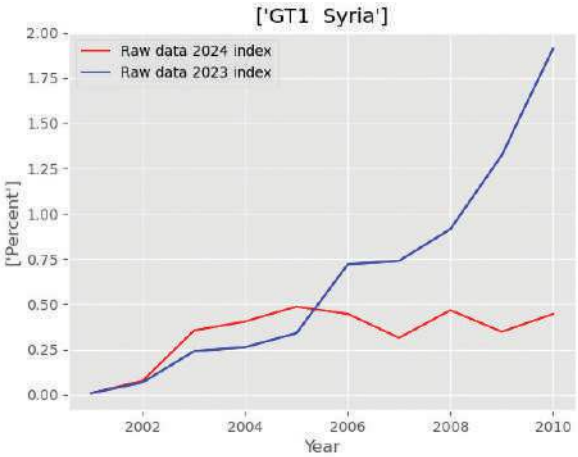
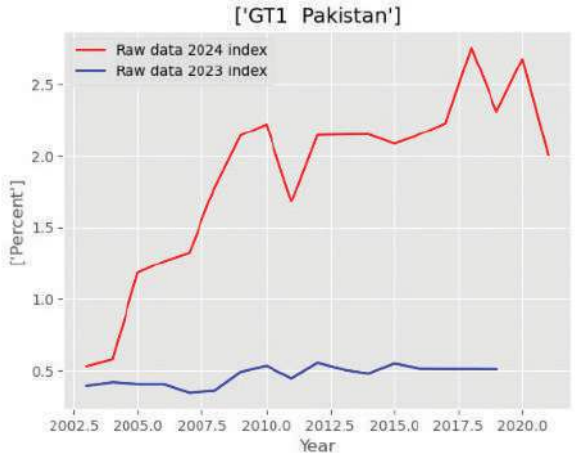


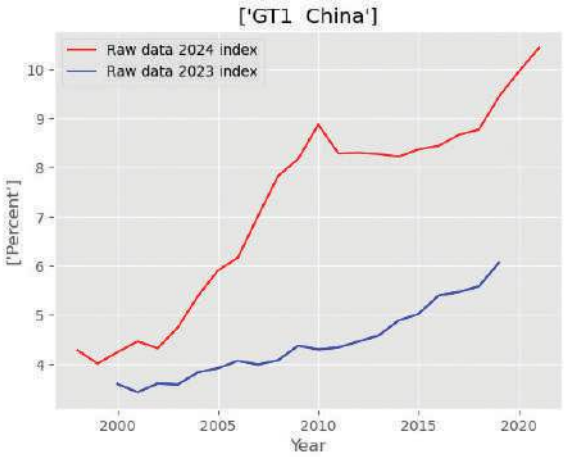
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

GT1: Share of export of environmental goods to total export (Percent)

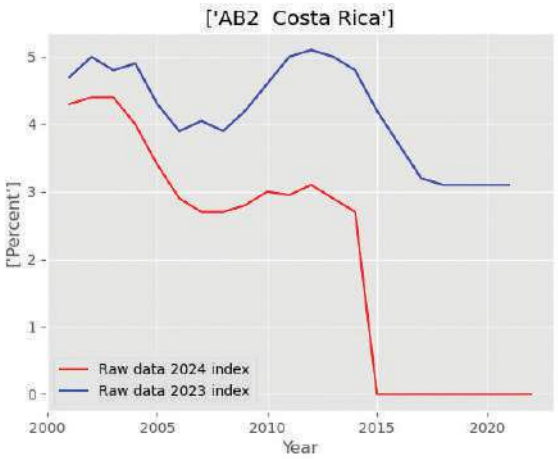








AB2: Prevalence of undernourishment (Percent)



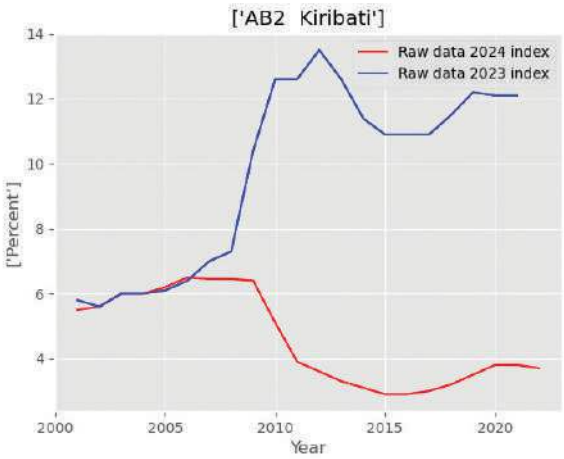
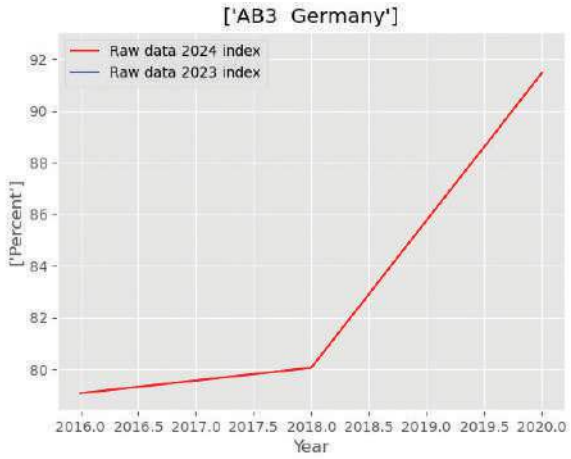
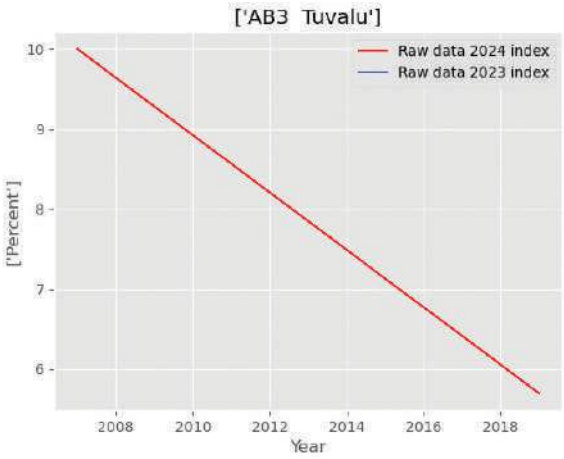


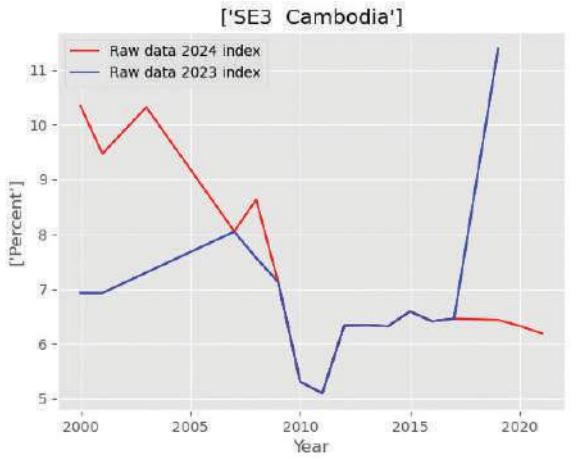
Figure A4. Divergences in databases between 2022 and 2023 for selected indicators and countries *(continued)*

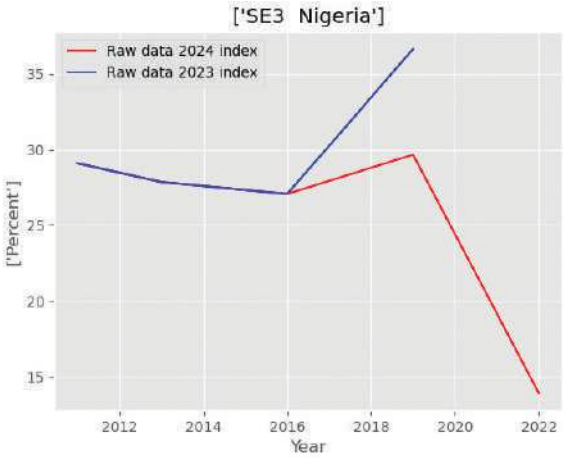
AB3: Proportion of population that has convenient access to public transport (Percent)

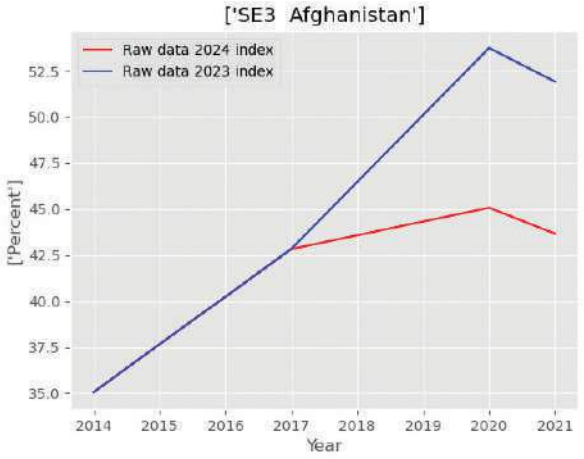


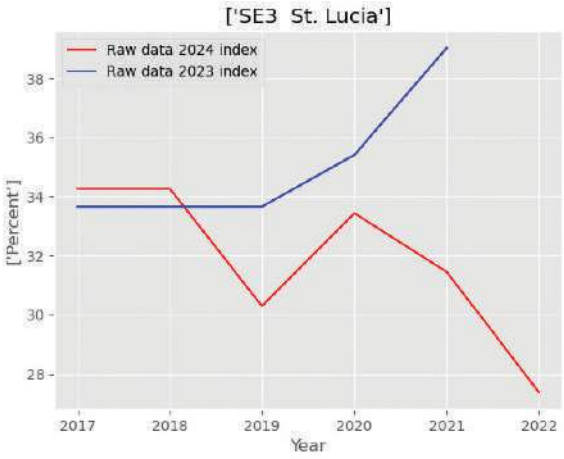


SE3: Share of youth (aged 15-24 years) not in education, employment, or training (Percent)









Annex 3. **Robustness check**

Composite indices often face criticism because they can be misleading if poorly constructed and interpreted.[161] Thus, evaluating confidence in the model and its underlying assumptions (i.e., robustness check) is the final critical step in developing a composite index. Two types of analyses were performed to validate the robustness of the Green Growth Index. First, the sensitivity of the Green Growth Index to changes in the model's input variables was examined. Second, the explanatory power of the scores was analyzed using correlation and regression to assess the ability of the indicators and their aggregated values (i.e., indicator categories and dimensions) to explain the structure of the Green Growth Index.

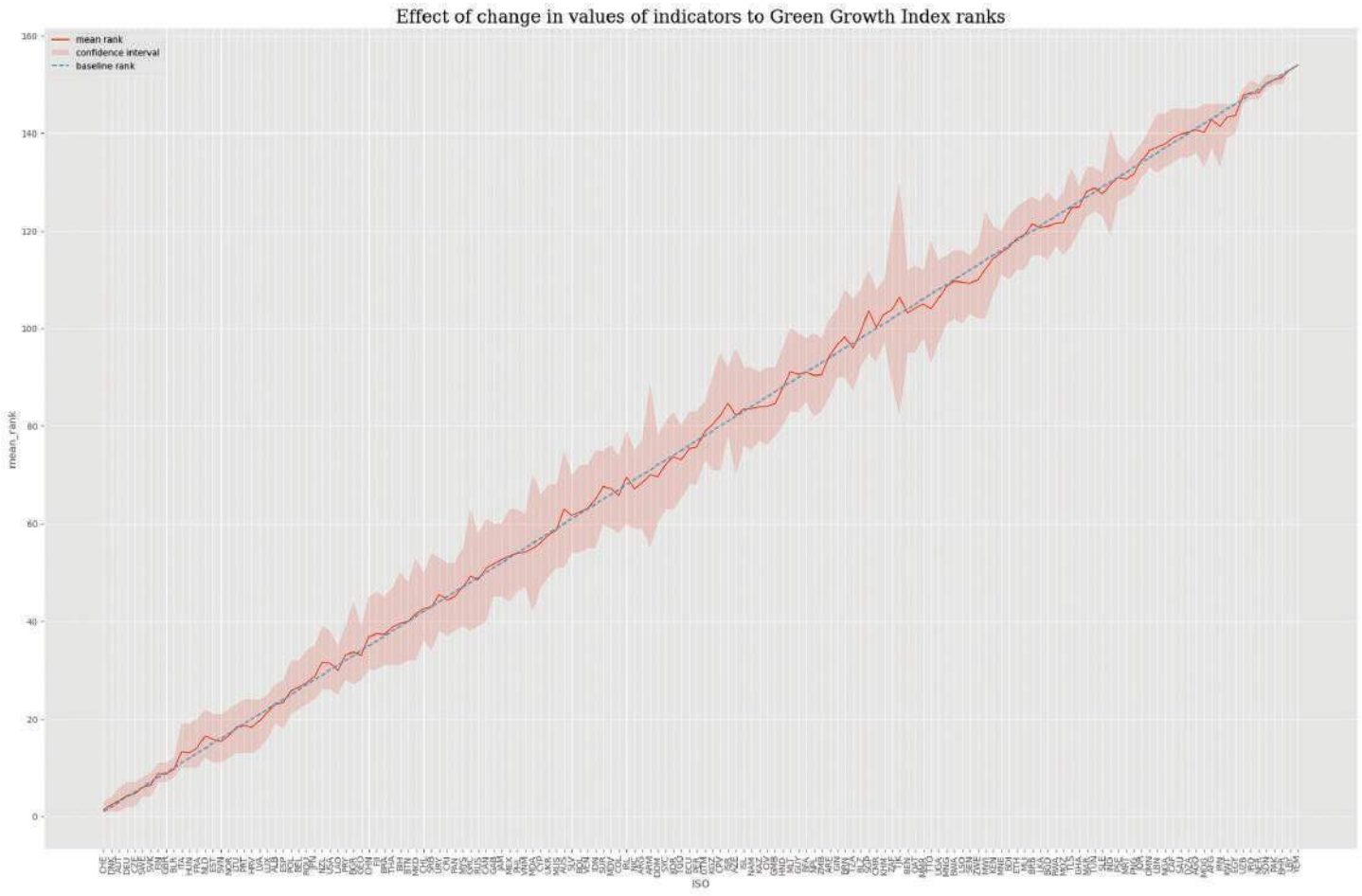
A. Sensitivity analysis

Monte Carlo methods are an easy and efficient class of algorithms often used for sensitivity analysis because they can simulate many experiments to obtain quantities of the tested objects.[162] In this analysis, we simulate perturbations to the 2024 Green Growth Index to estimate its sensitivity to the changes in the values and missing values of the indicators. Each simulation is run 1,000 times, and each run's number was determined empirically. The change was sampled from a Gaussian distribution to check the sensitivity to the changes in the values of the indicators. Random "nans" were added to the values of the indicators to check the sensitivity to missing data in indicators. This provided a stable estimate for each of the properties tested. The impacts on the Green Growth Index scores and ranks were analyzed in the simulation runs.

A.1 Changes in values of indicators

The sensitivity analysis checks for perturbations in the raw data of the indicators. This experiment aims to understand how the Index scores and the resulting ranks react to changes in the indicator values. In each simulation, modifications were made to the raw data of the indicators. As the first step, perturbations were sampled from a Gaussian distribution for each indicator. The distribution has a mean of zero; its standard deviation equals 10 percent of the measured value. As the second step, these perturbations were used in the values of the indicators. As the final step, a new Green Growth Index was computed using the perturbed data. These steps were repeated 1,000 times to calculate many slightly different scores for the Green Growth Index. Figure

Figure A5. Effect of changing values of indicators on the Green Growth Index ranks



A5 presents the results from these two steps, showing the average rank and 95 percent of the confidence interval for 1,000 runs. The mean rank in red deviates slightly from the baseline rank dotted in blue. There is nearly no deviation for countries at the top and bottom of the ranking. For countries in the middle, the average deviation ranges from none to 3 ranks. The confidence interval for those countries is also wider, ranging from around +5 to −5 ranks. These results indicate that the Green Growth Index is relatively robust to the changes in the indicator values.

A.2 Missing values

The sensitivity analysis also checks for the impacts of missing values on the ranks. Recall from the aggregation methods that categories with three indicators can still be computed if a single indicator is missing (Annex 1). While this method may cause distortions, it also considerably improves the number of countries covered in the Green Growth Index. To measure the potential distortions caused by data gaps, values were removed randomly by 5 percent of the available data points. A distinct set of values was removed for each run before calculating a new Green Growth Index. The simulation run results are presented in Figure A6, showing that uncertainty on the ranks grows as a country's rank increases. The confidence interval for the top 25 countries is centered around the baseline values. The scores range between +5 and −5 ranks at most. As the rank goes beyond 50, the average rank diverges from the baseline rank by around five ranks. Nonetheless, the relative ranks are mostly preserved. The average rank across simulations can vary by up to 10 ranks. The confidence interval for countries with a rank higher than 50 is wider. It can go as high as 15 ranks.

These results indicate that the impacts of missing data on the ranks are more significant than the changes in the values of the indicators. For this reason, improving data availability is a crucial step towards a more representative Green Growth Index. Simple imputation of missing data provides a temporary solution to this problem, as long as the confidence level based on the data availability is informed to guide the interpretation of the scores and ranks. Overall, the sensitivity analysis confirms that policymakers can confidently interpret the Green Growth Index.

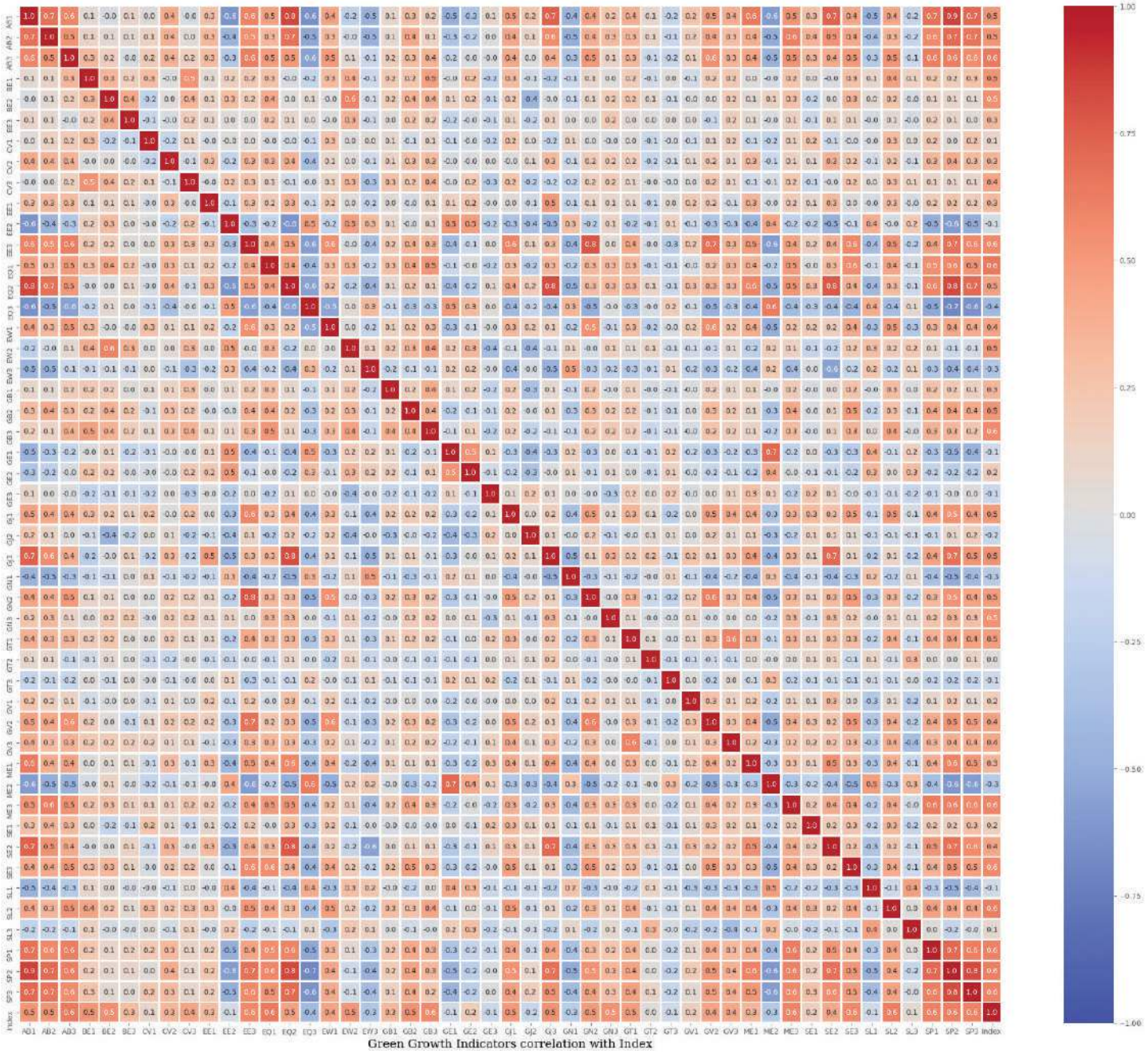
B. Analysis of explanatory power

B.1 Correlation analysis

A correlation analysis was conducted to assess the relationships among various indicators and to determine the correlation between normalized indicators and Green Growth Index scores.[163] The primary objective was to evaluate whether the indicators demonstrate meaningful associations with each other and the Index. The analysis covered cross-sectional and longitudinal dimensions,

Figure A6. Effect of missing values of the indicators on the Green Growth Index ranks

Figure A7. Green Growth Index correlation heatmap for Green Growth indicators, 2010-2023



Indicators:
AB1 - Population with access to basic services, i.e. Water, sanitation, electricity, and clean fuels; AB2 - Prevalence of undernourishment; AB3 - Universal access to sustainable transport; BE1 - Average proportion of Key Biodiversity Areas covered by protected areas; BE2 - Share of forest area to total land area; BE3 - Above-ground biomass stock in forest; CV1 - Red list index; CV2 - Tourism and recreation in coastal and marine areas; CV3 - Share of terrestrial and marine protected areas to total territorial areas; EE1 - Ratio of total primary energy supply to GDP; EE2 - Share renewable to total final energy consumption; EE3 - Efficiency in sustainable transport; EQ1 - $PM_{2.5}$ air pollution, mean annual population-weighted exposure; EQ2 - DALY rate due to unsafe water sources; EQ3 - Municipal solid waste (MSW) generation per capita; EW1 - Water use efficiency; EW2 - Share of freshwater withdrawal to available freshwater resources; EW3 - Sustainable fisheries as a proportion of GDP; GB1 - Proportion of seats held by women in national parliaments; GB2 - Gender ratio of an account at a financial institution or mobile-money-service provider; GB3 - Getting paid, laws and regulations for equal gender pay; GE1 - Ratio of CO_2 emissions to population, including AFOLU; GE2 - Ratio non-CO_2 emissions (CH_4, N_2O and F-gas) excluding AFOLU to population; GE3 - Ratio non-CO_2 emissions (CH_4 , N_2O and F-gas) in Agriculture and LUCF to population; GJ1 - Share of green employment in total manufacturing employment; GJ2 - Renewable Energy Employment by Country to total renewable energy; GJ3 - Employed population below international poverty line, by sex and age; GN1 - 7-Year rolling average, patents on environment technologies; GN2 - University-industry collaboration in Research & Development; GN3 - Installed renewable electricity-generating capacity; GT1 - Share export of environmental goods (OECD and APEC class.) to total export; GT2 - CO_2 emissions embedded in trade; GT3 - Water virtual trade flows; GV1 - Ratio of adjusted net savings to GNI, including particulate emission damage; GV2 - Degree of integrated water resources management implementation, financing GV3 - Total amount of funding to promote environmentally sound technologies per GDP; ME1 - Total domestic material consumption per unit of GDP; ME2 - Total material footprint per capita population; ME3 - Share of food loss to production and food waste to food consumption; SE1 - Inequality in income based on Palma ratio; SE2 - Population with access to basic services by urban/rural, i.e. electricity; SE3 - Share of youth (aged 15-24 years) not in education, employment or training; SL1 - Soil nutrient budget; SL2 - Share agriculture organic to total agriculture land area; SL3 - Share of ruminant livestock population to agricultural area; SP1 - Proportion population above statutory pensionable age receiving a pension; SP2 - Universal health coverage (UHC) service coverage index; SP3 - Proportion of urban population living in slums

examining 48 green growth indicators from 2010 to 2023 across 154 countries and corresponding Green Growth Index scores. Figure A7 visually represents the correlation between normalized indicators and Index scores, providing a comprehensive overview of their relationships. Red and blue colors represent positive and negative relationships, respectively. Darker red and blue colors indicate stronger relationships. Very strong positive or negative correlations among green growth indicators are not apparent on the heatmap. This lack of strong correlation ensures that changes in one indicator are not necessarily linked to shifts in another.

C. Regression analysis

The regression analyzes how the variance in green growth indicators explains the Green Growth Index scores. Using panel data from 2010 to 2023, the analysis incorporated both cross-sectional and longitudinal global data. A machine learning approach, specifically Random Forest regression, was applied to these two-dimensional data to model the variance in the Green Growth Index (Table A.1). The overall regression model was statistically significant, with an R-squared value of 0.862, indicating excellent model fitness. The adjusted R-squared of 0.851, closely aligned with the R-squared, suggests minimal risk of overfitting and supports the reliability of the correlation. These results demonstrate that 85 percent of the variance in the dependent variable (Green Growth Index) is attributable to the variance in the independent variables (normalized indicators). Moreover, Table A1 highlights the P-value statistics from the regression analysis. Indicators with P-values below 0.05 are deemed statistically significant, further validating the model's robustness. All green growth indicators have P-values below 0.05, signifying their strong statistical significance in explaining the variance in the Green Growth Index scores. This result indicates that each indicator has a meaningful and reliable impact on the Index, highlighting their importance in shaping and influencing green growth outcomes.

Table A1. Effect of green growth indicators on Green Growth Index scores, 2010-2023

Indicator code	Indicator names	Coefficient	Standard error	P-value
Constant		**-10.383**	**2.387**	**0.000**
AB1	Population with access to basic services i.e. Water, sanitation, electricity. and clean fuels	0.006	0.014	0.001
AB2	Prevalence of undernourishment	-0.027	0.004	0.000
AB3	Population with convenient access to public transport	0.028	0.005	0.000
BE1	Average proportion of Key Biodiversity Areas covered by protected areas	0.004	0.002	0.001
BE2	Share forest area to total land area	0.027	0.002	0.000
BE3	Above-ground biomass stock in forest	-0.009	0.003	0.002
CV1	Red list index	0.012	0.003	0.000
CV2	Tourism and recreation in coastal and marine areas	0.025	0.002	0.000
CV3	Share of terrestrial and marine protected areas to total territorial areas	0.031	0.002	0.000
EE1	Energy intensity level of primary energy	0.039	0.003	0.000
EE2	Share renewable to total final energy consumption	0.008	0.002	0.000
EE3	Efficiency in sustainable transport	0.023	0.006	0.000
EQ1	PM2.5 air pollution, mean annual population- weighted exposure	0.041	0.003	0.002
EQ2	DALY rate due to unsafe water sources	-0.018	0.005	0.002
EQ3	Municipal solid waste (MSW) generation per capita	0.015	0.004	0.000
EW1	Water use efficiency	0.034	0.004	0.000
EW2	Share freshwater withdrawal to available freshwater resources	0.092	0.002	0.000
EW3	Sustainable fisheries as a proportion of GDP	0.045	0.003	0.000
GB1	Proportion of seats held by women in national parliaments	0.008	0.003	0.007
GB2	Share of adults (15 years and older) with an account at 8 financial institution or mobile- money-service provider	0.014	0.006	0.000
GB3	Getting paid, laws and regulations for equal gender pay	0.027	0.002	0.000
GE1	Ratio of CO_2 emissions to population. including AFOLU	0.000	0.003	0.013
GE2	Ratio non-CO_2 emissions (CH_4 N_2O and F-gas) excluding AFOLU to population	0.022	0.002	0.000

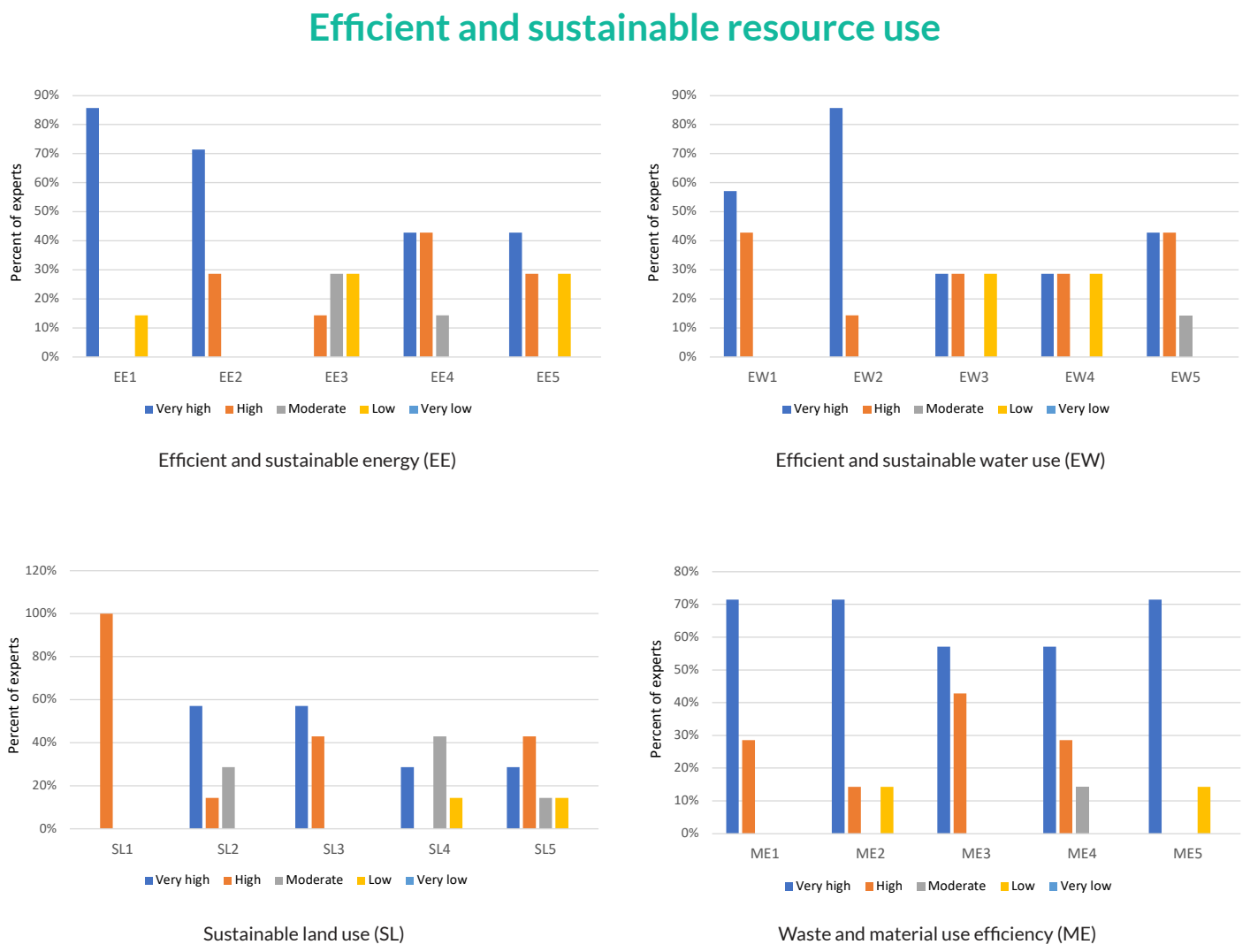
Table A1. Effect of green growth indicators on Green Growth Index scores, 2010-2023

Indicator code	Indicator names	Coefficient	Standard error	P-value
Constant		**-10.383**	**2.387**	**0.000**
GE3	Ratio non-CO, emissions (CH_4 N_2O and F-gas) in Agriculture and LUCF to population	0.021	0.003	0.000
GJ1	Share of green employment in total manufacturing employment	0.063	0.003	0.000
GJ2	Renewable Energy Employment by Country to total renewable energy	-0.093	0.006	0.041
GJ3	Employed population below international poverty line	0.094	0.005	0.000
GN1	7 Years rolling average Patents on environment technologies	0.027	0.002	0.000
GN2	University-industry collaboration in Research & Development	0.062	0.004	0.000
GN3	Installed renewable electricity-generating capacity	0.043	0.004	0.000
GT1	Share export of environmental goods to total export	0.045	0.005	0.010
GT2	CO_2 emissions embedded in trade	0.017	0.005	0.001
GT3	Water virtual trade flows	0.022	0.006	0.000
GV1	Ratio of adjusted net savings to GNI, including particulate emission damage	0.034	0.003	0.000
GV2	Degree of integrated water resources management implementation, financing	0.021	0.003	0.000
GV3	Total amount of funding to promote environmentally sound technologies per GDP	0.035	0.004	0.000
ME1	Domestic material consumption per unit of GDP	-0.052	0.008	0.000
ME2	Total material footprint (MF) per capital population	0.027	0.004	0.000
ME3	Share of food loss to production and food waste to food consumption	0.042	0.009	0.000
SE1	Inequality in income based Palma ratio	0.012	0.005	0.013
SE2	Population with access to basic services by urban/ rural, i.e. electricity	0.019	0.003	0.000
SE3	Share of youth (aged 15-24 years) not in education, employment or training	0.021	0.004	0.000
SL1	Soil nutrient budget	0.013	0.003	0.000
SL2	Share agriculture organic to total agriculture land area	0.010	0.002	0.000
SL3	Share of ruminant livestock population to agricultural area	0.085	0.009	0.000
SP1	Proportion population above statutory pensionable age receiving a pension	0.019	0.002	0.000
SP2	Universal health coverage (UHC) service coverage index	-0.007	0.006	0.024
SP3	Proportion of urban population living in slums	0.034	0.004	0.000

All green growth indicators have P-values below 0.05, signifying their strong statistical significance in explaining the variance in the Green Growth Index scores. This result indicates that each indicator has a meaningful and reliable impact on the index, highlighting their importance in shaping and influencing green growth outcomes

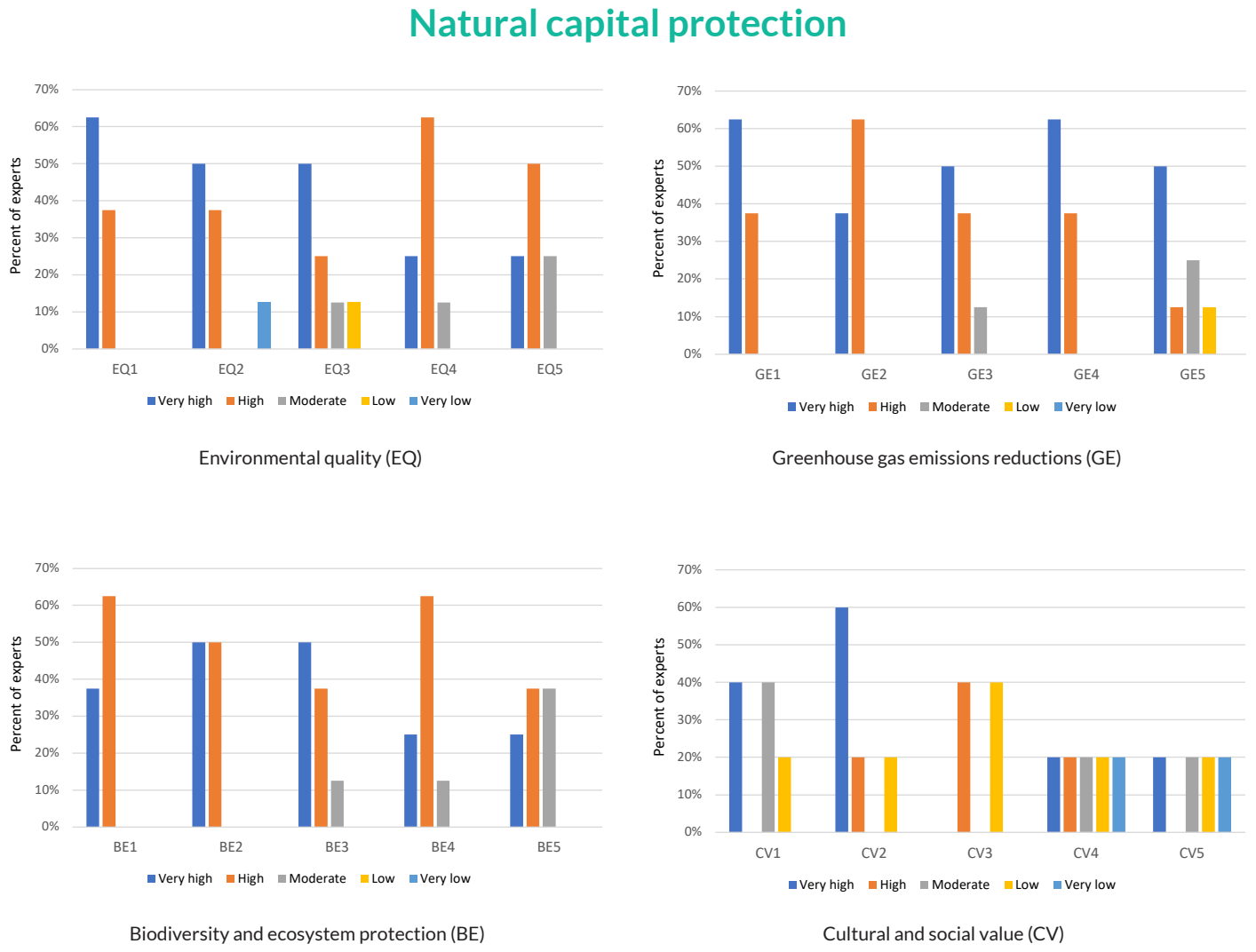
Annex 4. Annex 4 International experts' ratings on the 80 green growth indicators selected by national experts

Figure A8. Ratings given by international experts on the 20 indicators for efficient and sustainable resource use



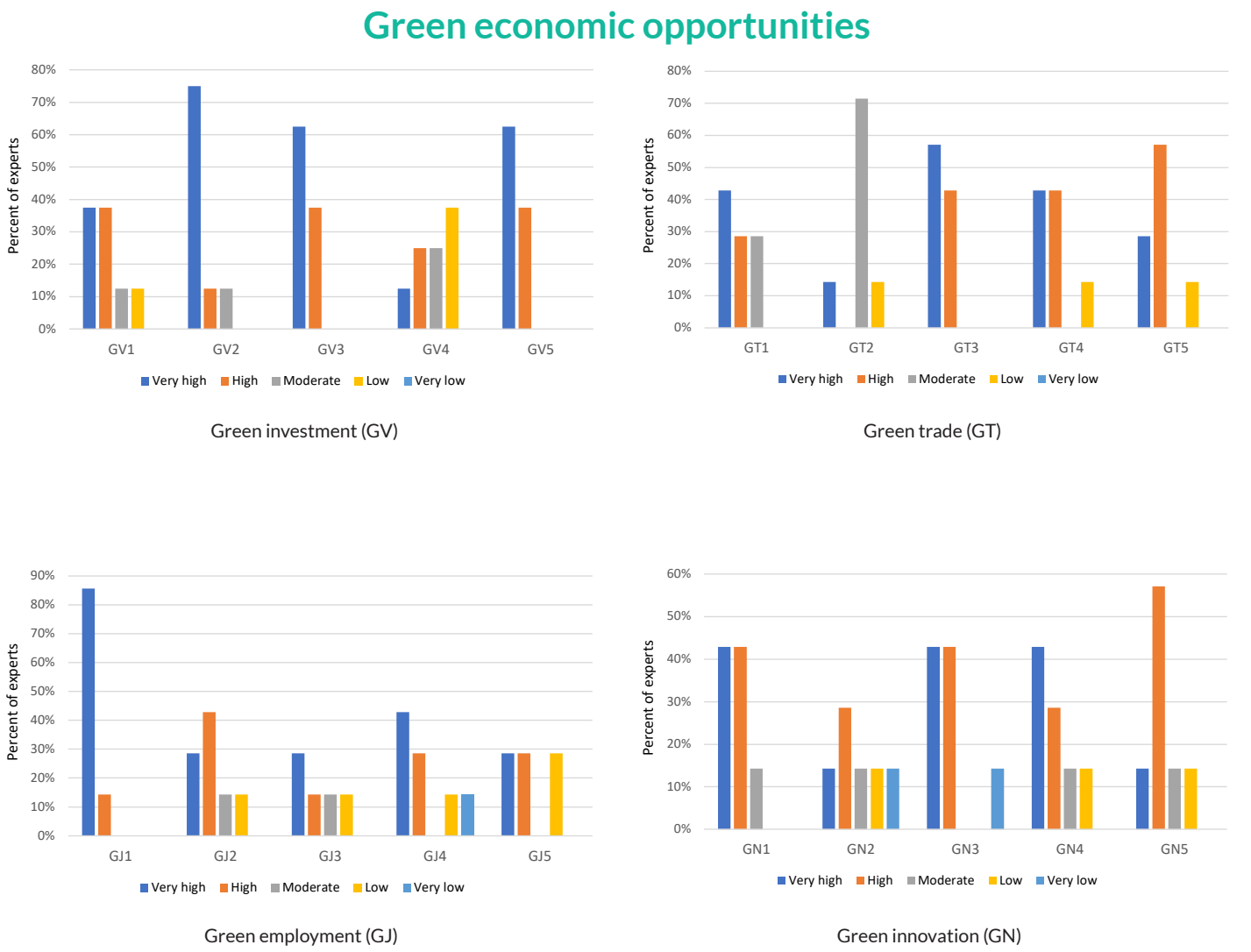
EE1 - Energy intensity, EE2 - Renewable energy share, EE3 - Efficient transport, EE4 - Low-carbon electricity, EE5 - Per capita electricity consumption
EW1 - Water use efficiency, EW2 - Level of water stress, EW3 - Sustainable fisheries, EW4 - Share of surface irrigation, EW5 - Renewable water resources per capita
SL1 - Soil nutrient balance, SL2 - Organic agriculture area, SL3 - Share ruminant livestock, SL4 - Agricultural productivity, SL5 - Farm machinery per unit land
ME1 - Material consumption per GDP, ME2 - Material footprint, ME3 - Food loss and food waste, ME4 - Municipal solid waste recycled, ME5 - Waste water treatment facilities

Figure A9. Ratings given by international experts on the 20 indicators for natural capital protection



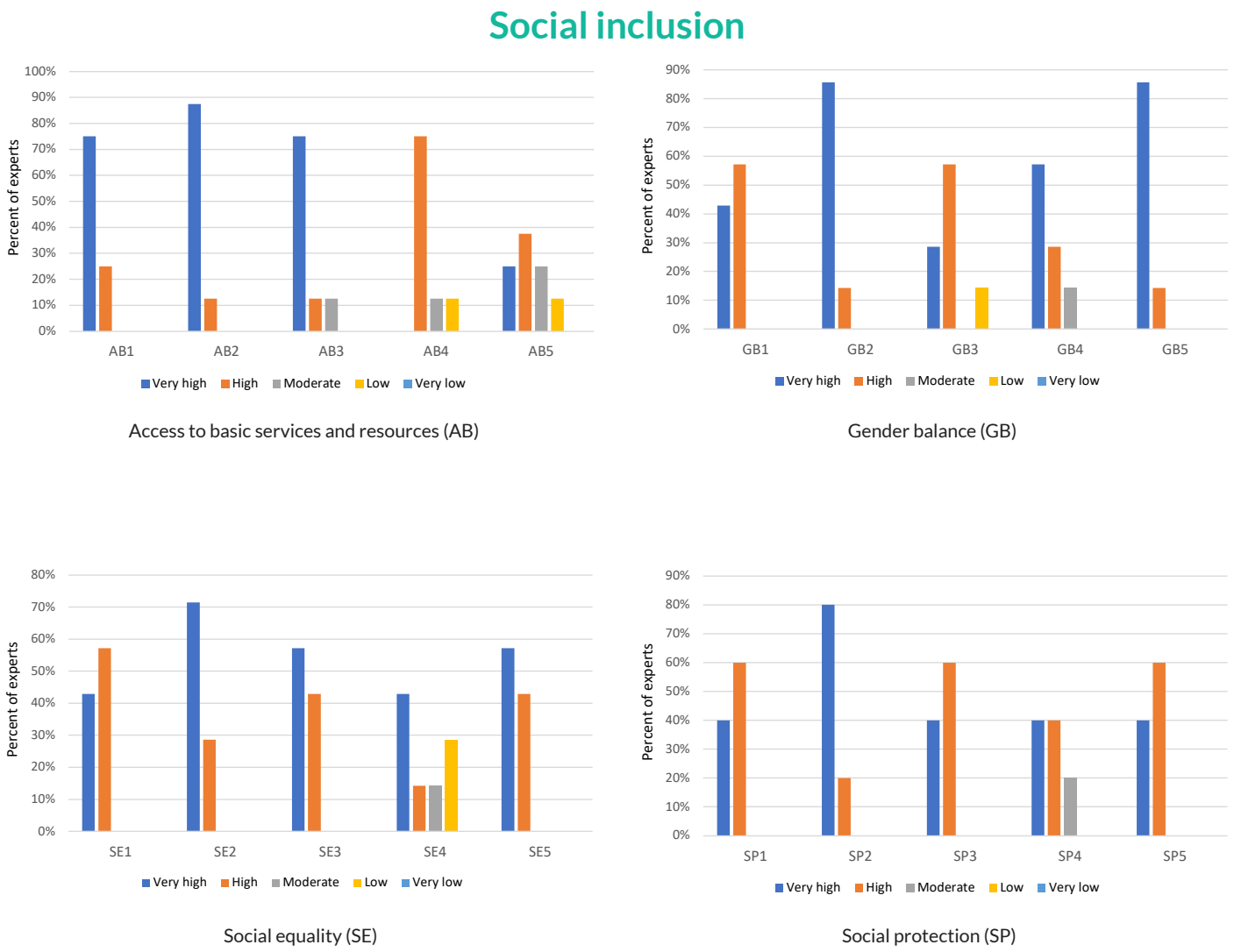
EQ1 - PM2.5 air pollution, EQ2 - DALY rate from unsafe water, EQ3 - Solid waste generation, EQ4 - Chlorophyll-a deviations, EQ5 - Water with good ambient quality
GE1 - CO2 emissions per capita, GE2 - Non-CO2 per capita excl. AFOLU, GE3 - Non-CO2 emissions in AFOLU, GE4 - Carbon intensity of energy production, GE5 - CO2 emissions per mfg value-added
BE1 - Protected key biodiversity areas, BE2 - Share of forest areas, BE3 - Forest above-ground biomass, BE4 - Forest under certification scheme, / BE5 - Change in extent of water ecosystems
CV1 - Local breeds risk of extinction, CV2 - Terrestrial protected areas, CV3 - Tourism contribution to GDP, CV4 - Plant genetic resources accessions, CV5 - Share of exports of cultural goods

Figure A10. Ratings given by international experts on the 20 indicators for green economic opportunities



GV1 - Adjusted net savings, GV2 - Renewable electricity capacity, GV3 - Financial flows for clean energy R&D, GV4 - Agriculture orientation index, GV5 - Road quality
GT1 - Exports of environmental goods, GT2 - Environmental technologies exported, GT3 - ISO 14001 certificates issued, GT4 - New business density, GT5- High-technology exports
GJ1 - Green employment in manufacturing, GJ2 - Employed below poverty line, GJ3 - Vulnerable employment, GJ4 - Firms offering formal training, GJ5 - ODA flows for scholarships
GN1 - Environmental technologies, GN2 - Scientific and technical journals, GN3 - Researchers per million inhabitants, GN4 - Medium/ high-tech mfg value-added, GN5 - Trademark applications

Figure A11. Ratings given by international experts on the 20 indicators for social inclusion



AB1 - Access to safe water and sanitation, AB2 - Access to electricity and clean fuels, AB3 - Prevalence of undernourishment, AB4 - Convenient access to public transport, AB5 - Property rights
GB1 - Women in national parliaments, GB2 - Gender account in financial institution, GB3 - Equal gender pay, GB4 - Mothers with maternity cash benefits, GB5 - School enrollment gender parity
SE1 - Inequality in income, SE2 - Rural-urban access to electricity, SE3 - Youth unemployment disparity, SE4 - Age dependency ratio, SE5 - Cash benefit for people with disabilities
SP1 - Share of old people receiving pension, SP2 - Universal health coverage, SP3 - Population living in slums, SP4 - Victims of intentional homicides, SP5 - Score of Hyogo Framework

Annex 5. **International expert group**

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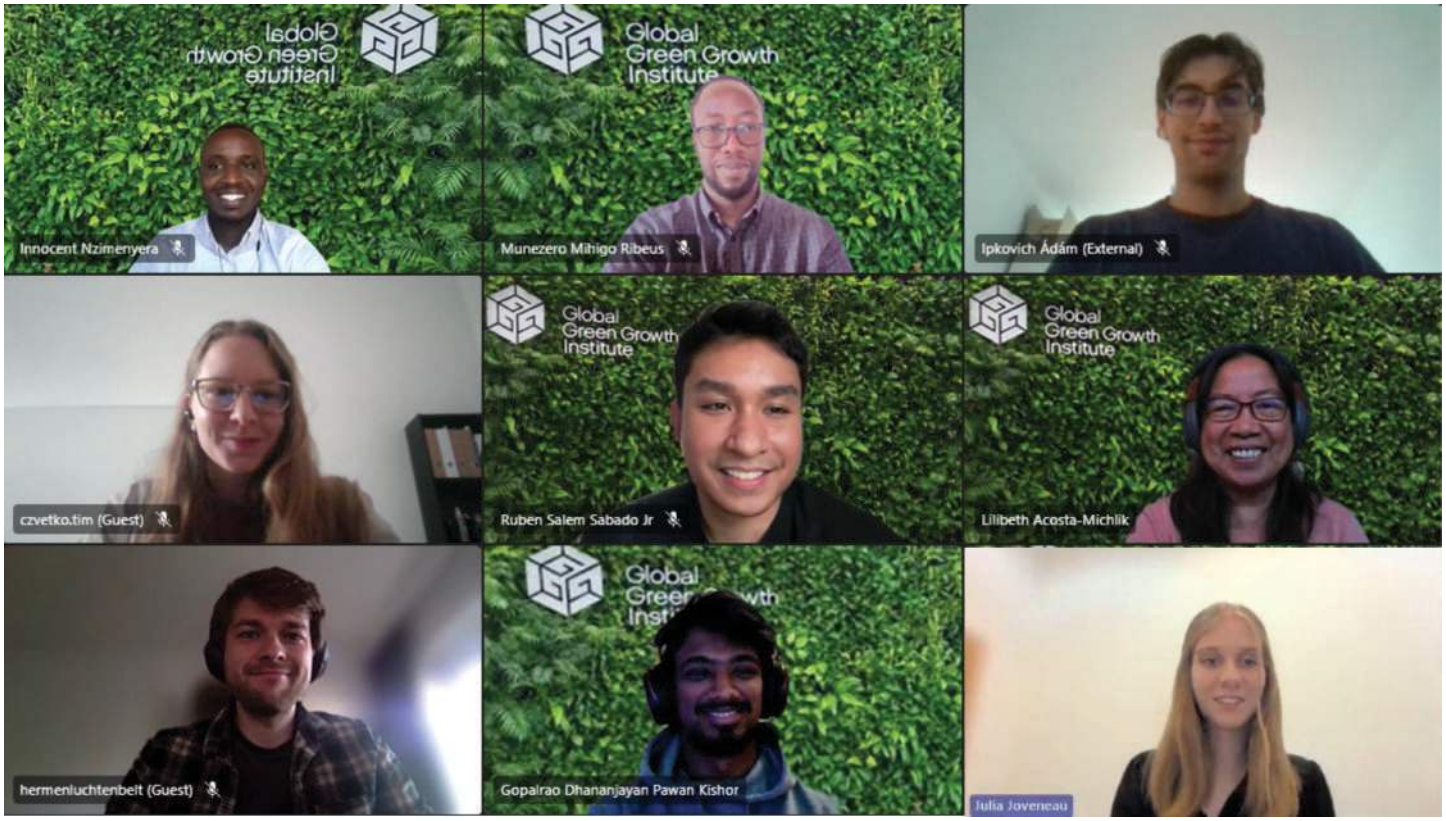
Annex 8. **The GGPM Team**



Lilibeth Acosta, based in Hungary, is a Deputy Director of GGGI's Climate Action and Inclusive Development Division and Program Manager for the Green Growth Performance Measurement. She joined GGGI in 2018 and, since then, has been leading the development and applications of the Green Growth Index and Simulation Tool, which received the AI for Good Summit Winning Use Cases in Geneva and the World Artificial Intelligence Conference Elite Project in Shanghai in 2024. Lilibeth has over 20 years of experience in indicator development, integrated assessment and scenario modeling of climate change vulnerability and adaptation, and sustainable development in the fields of ecosystem and biodiversity, agriculture and land use, and renewable energy. She is one of the experts in the Task Force for Modelling and Scenarios of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). She worked as a development specialist at the National Economic Development Authority in the Philippines, a senior scientist at the Potsdam Institute for Climate Impact Research in Germany, and a researcher in Environmental Science departments at universities in Japan, Belgium, the United Kingdom, and the Philippines. Before joining GGGI, she worked as a consultant in the ADB, UNCCD, and UNCTAD. She holds a Ph.D. in Agricultural Policy from the University of Bonn (Germany), an MPhil in Economics and Politics of Development from the University of Cambridge (England), and a BSc in Agricultural Economics from the University of the Philippines.

Innocent Nzimenyera, based in Rwanda, is an AI and data analyst with the Green Growth Performance Measurement Team (GGPM), with a strong background in mathematics and statistics and expertise in transforming complex data sets into actionable insights to support strategic decision-making. He has led capacity-building initiatives and provided technical support for developing the Green Growth Index in Zambia, Ghana, and Togo. He also contributed to analyzing winning AI-related use cases presented at the AI for Good Summit in Geneva, Switzerland, and the World Artificial Intelligence Conference in Shanghai, China. He has served as an AI for Good Scholar with the International Telecommunication Union (ITU) of the United Nations, a Data Analyst Consultant with CAID, and a Research Assistant at ARED Group. He has also contributed to Rwanda's development initiatives as a Digital Ambassador with the Ministry of ICT and Innovation and as a Data Entry Clerk with the Ministry of Education. He holds a master's degree in information technology, specializing in Applied Machine Learning and Data Science from Carnegie Mellon University, and a bachelor's degree in computer science from the University of Rwanda. He also certified in Artificial Intelligence and Deep Learning by the FAST Foundation in Armenia.

Ruben Sabado, Jr., based in the Philippines, is a GGPM consultant supporting applications of Green Growth Index projects. He has supported the GGPM team since 2020 on projects related to developing National Green Growth

Indices in Zambia, Lao PDR, Ghana, Kenya, and Togo. Furthermore, he also supported the development of other indices related to green recovery and gender. His main tasks involve identifying green growth-related indicators, developing training modules, and providing technical support online and through face-to-face workshops to the GGGI country teams and government partners. He is also a part of the GGPM publication team, supporting the collection and literature review and preparing graphics and analysis for the Green Growth Index reports. He earned his Bachelor of Science in Agricultural Economics with a major in marketing and prices from the University of the Philippines. He values using data and tools that generate policy-relevant information to guide sustainable development.

Ribeus Mihigo Munezero, based in Rwanda, is a Green Growth Performance Measurement consultant, with experience in data-driven sustainability solutions. Since joining the Global Green Growth Institute (GGGI) in May 2022 as a Python programmer and modeler, he has supported the team in advancing the Green Growth Simulation Tool and Green Growth Index. His work focuses on computing national and global indices and developing simulation tools to analyze policy scenarios and models. Mihigo has led capacity-building initiatives and provided technical support for developing the first edition of the national Green Growth Index for Kenya, developed through close collaboration between the National Treasury and Economic Planning (NT&EP) and GGGI. Mihigo's passion for leveraging data, metrics, and evidence-based insights to inform strategic decision-making has been a consistent theme in his career. Prior to GGGI, he served as a researcher and MEL data coordinator at One Acre Fund, collaborating with the deputy country director and stakeholders to refine the Rwanda program's strategic plan, enhance sustainability, and research innovative products and services to benefit farmers. Mihigo holds a master's degree in Electrical and Computer Engineering from Carnegie Mellon University and a Bachelor of Science in Electronics and Telecommunications Engineering from the University of Rwanda, combining technical expertise with a commitment to sustainable development and innovation.

Adam Ipkovich, based in Hungary, is a GGPM consultant specializing in AI-driven decision-support tools and small data solutions, with a focus on reducing expert workloads. He holds a BSc in Mechatronics Engineering; however, his main interests lie in developing scalable solutions for complex systems, integrating advanced AI methodologies to address sustainability challenges, and enhancing decision-making processes through innovative technologies. His association with the Global Green Growth Institute (GGGI) began as an intern in 2022 and continued as a consultant in 2024. Since 2021, Adam has collaborated closely with the University of Pannonia, contributing to research in climate science and industrial development. His expertise spans decision-support systems, MLOps, small data methodologies, and network analysis, emphasizing interpretability and informed decision-making. Adam combines technical expertise with a passion for sustainability and innovation, delivering impactful solutions that bridge cutting-edge research and practical applications.

Julia Joveneau, based in Hungary, is an analyst for the GGPM team. She joined GGGI in October 2023 to support the application of the Green Growth Simulation Tool. She holds a Master's degree in Mathematical Engineering from the Louvain School of Engineering in Belgium, and a Bachelor's degree in Engineering from the same School. She followed specialization tracks in applied chemistry and physics and applied mathematics. She particularly enjoys interdisciplinarity and has a strong interest in modeling and optimization.

Hermen Luchtenbelt, based in the Netherlands, is a GGPM consultant who is supporting the development of the Green Growth Simulation Tool. He joined the GGPM team as an intern in May 2020 and as a consultant in November 2020. In his current role, Hermen is responsible for developing models related to agriculture, natural capital protection, greenhouse gas emissions, forestry, and land use, as well as supporting the development of new model components. He also worked on preparing spatial maps for the 2021 Green Growth Technical report. Prior to joining GGGI, Hermen completed a consultancy at the Osotua foundation in Kenya, and works as a researcher on integrated assessment modelling at PBL in the Netherlands. He holds a MSc in Climate Studies, specializing in biogeochemical cycles, as well as a MSc in Environmental Economics and Natural Resource Management from Wageningen University in the Netherlands. Hermen completed his BSc in Economics and Governance, with a specialization in Agricultural Economics, at the same University.

Pawan Kishor, based in Hungary, is a Green Growth Performance Measurement consultant involved in the work of the Green Growth Simulation Tool. He joined GGGI in May 2024 as intern for developing system dynamics models for circular economy applications and pilot testing them for Hungary's Water, Wastewater, Solid waste, and material use efficiency sectors. He is currently developing additional SDG co benefits for the circularity model within the ggsim tool. Pawan is an Environmental Engineering student at Technische Universität Dresden and a DAAD ERASMUS+ scholarship recipient. He has experience in circular economy modeling, life cycle assessment (LCA), and sustainability analysis. He has also served as a student tutor for the Circular Economy Chair at TU Dresden, facilitating excursions and academic engagement. Pawan holds a Bachelor's degree in Civil Engineering from Savitribai Phule Pune University, India, and is fluent in multiple languages, including English, Hindi, and German. Passionate about driving sustainable development, he specializes in data-driven environmental impact analysis and innovative solutions for climate resilience and resource efficiency.

Timea Czvetko is a PhD student in the Chemical and Material Sciences field at the University of Pannonia, Hungary, and serves as a research fellow at the Abonyilab – HUN-REN- PE Complex Systems Monitoring Research

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