Summary Report

GREEN GROWTH INDEX

Concept, Methods and Applications

OCTOBER 2019

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PREFACE

It is a common adage that "you can't manage what you don't measure," and this is no less applicable in countries' ambitions to transition to a green model of economic growth and development. With this in mind, the Global Green Growth Institute (GGGI) embraced the significant challenge of developing a global index that measures the performance of its Member and partner countries as they pursue green growth.

This report presents the development, main findings and applications of GGGI's Green Growth Index, which provides metrics for tracking national green growth ambitions of 115 countries including their achievements against some elements of the Sustainable Development Goals (SDGs), the Paris Agreement on Climate Change, and the Aichi Biodiversity Targets.

The SDGs, the Paris Agreement, and the Aichi Biodiversity Targets manifest the critical global challenges confronting humanity — poverty and inequality, global warming, and biodiversity loss. Green growth emphasizes achieving these goals and targets while supporting economic growth. As the new model of growth, "greening" the productive economic sectors entails innovative policy strategies and investment schemes. GGGI supports countries to develop, implement, and evaluate policies that will help them attain their green growth and sustainable development ambitions. As such, at the request of its Member countries, GGGI's Green Growth Performance Measurement team, led by Dr. Lilibeth Acosta, developed the first composite Green Growth Index benchmarked against internationally-agreed sustainability targets.

GGGI's Green Growth Index is a product of more than two years of intensive consultations with more than 300 global experts of various disciplines, inter alia, international organizations, government agencies, non-profit institutions, and the academia. The Index provides countries with a tool to assess the impacts of green growth policy implementation and compare their performance with peers in their respective regions over time. The indicators included in the Green Growth Index align with the key elements of GGGI's six Strategic Outcomes, which promote poverty reduction, social inclusion, environmental sustainability, and economic growth.

As part of GGGI's knowledge products, the Green Growth Index helps foster collaboration with international organizations that advocate the green model of economic growth. GGGI presently collaborates with the African Development Bank (AfDB) to apply the Index to the African socio-economic and institutional contexts and with the United Nations Environment Programme (UNEP) to link green growth baseline performance to scenarios of progress. Through these collaborations, GGGI intends to further develop and improve the Green Growth Index in years to come. This can be done by leveraging the efforts of various international organizations to improve the indicators, targets, and underlying data for the SDGs; the work of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) to increase knowledge and data on biodiversity; and the ambitions of governments to develop Nationally Determined Contributions (NDCs) under the Paris Agreement.

In 2020, GGGI plans to pilot the Green Growth Index-related "Policy Simulation Tool" that will serve to explore ways and means by which governments can consider the implications of taking certain policy and investment actions with the goal of improving their green growth performance.

The development of the Green Growth Index would not have been possible without the unwavering support of our Member countries. We are grateful for the encouragement that our Members provided. We would also like to thank everyone who contributed through the technical workshops and technical reviews of early drafts of the Index for their valuable inputs. We also acknowledge Vivid Economics and The Economist Intelligence Unit for developing the initial version of the Green Growth Index in 2017, under contract with GGGI.

We hope that countries will find the Green Growth Index valuable and useful in making key decisions and taking action in their quest for a greener future.

Frank Rijsberman
Director General
Global Green Growth Institute

CONTENTS

HIGHLIGHTS

As a growing number of countries aspire to achieve the promise of green growth, measuring green growth performance is becoming an increasingly important priority. The Green Growth Index is the first benchmarked composite index designed to track and assess green growth performance of 115 countries in four dimensions of green growth. The Index is intended to engage policymakers, researchers, and other stakeholders in identifying priorities and opportunities for achieving socially inclusive and environmentally sustainable economic development through green growth.

1 GGGI's Green Growth Index pioneered an inclusive and rigorous process that is concept-driven, expert-guided, and policy-relevant

The Global Green Growth Institute (GGGI) launched the first global Green Growth Index to show how countries perform in using and protecting natural resources for a sustainable future and in creating economic opportunities for an inclusive society. The framework, representing 36 green growth indicators, was built on robust concepts, guided by multidisciplinary experts, and developed in consultation with policymakers.

2 Less than 25% of the 115 countries ranked in the Index are close to reaching sustainability targets for green growth

With half of the countries performing only moderately and more than 25% scoring low on the Green Growth Index, much more effort is needed to build a "greener" world. Actions are most critical for green economic opportunities where performance is lowest globally.

3 Gaps in SDG indicators to track performance in green economic opportunities is a challenge to developing the Index

The 36 indicators for the Green Growth Index guide policymakers to achieve the SDGs, Paris Climate Agreement, and Aichi Biodiversity Targets. More than half of the green growth indicators are based on SDGs, but there are insufficient SDG indicators to measure economic opportunities from green growth.

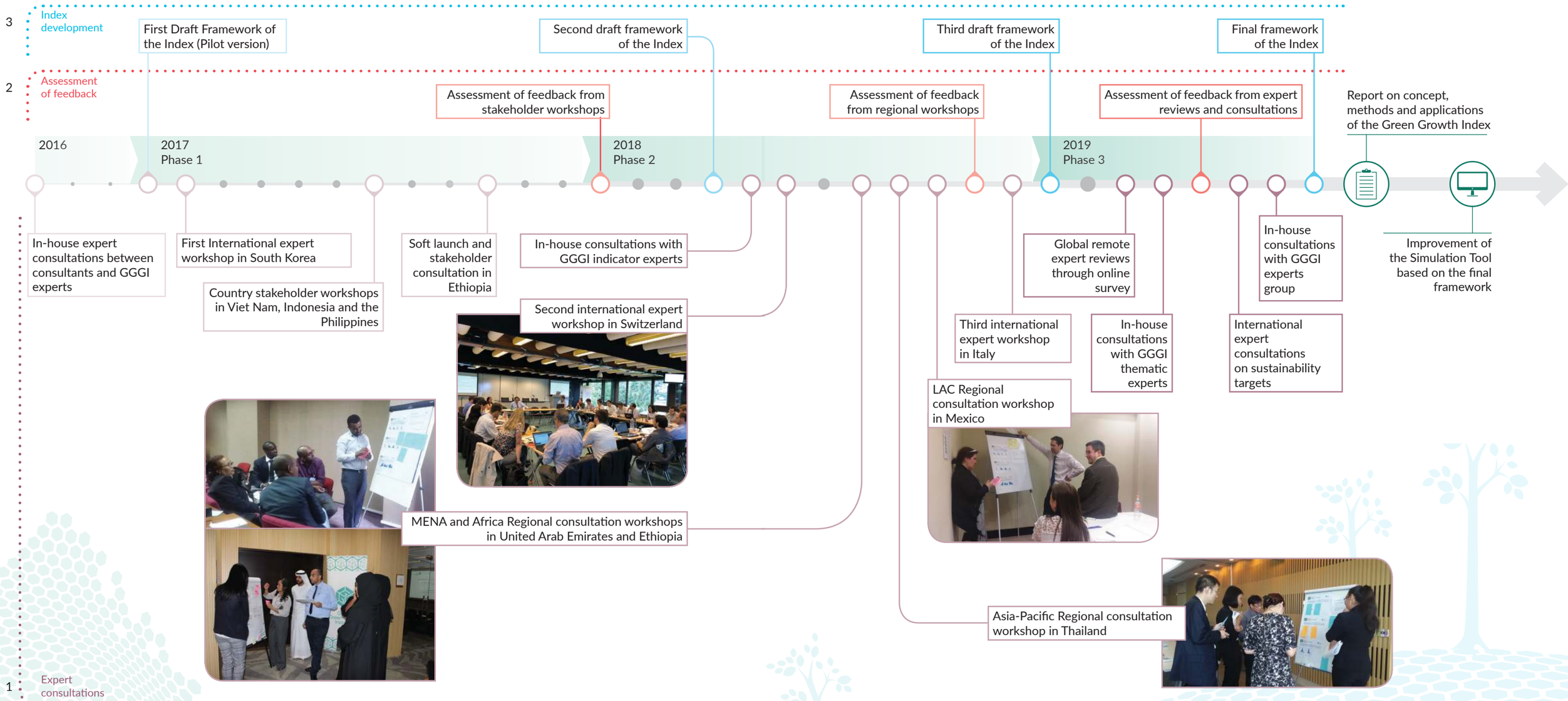
4 Rising momentum for green growth offers huge opportunity for global actions to reach targets and close gaps

Green growth targets remain distant for many countries. But growing interest among policymakers, practitioners, and stakeholders in finding a common framework and policy-relevant indicators to measure green growth performance hints at an increasing green growth momentum. GGGI is contributing to this momentum.

1 GGGI's Green Growth Index pioneered an inclusive and rigorous process that is concept-driven, expert-guided, and policy-relevant

1.1 Design process for the Green Growth Index

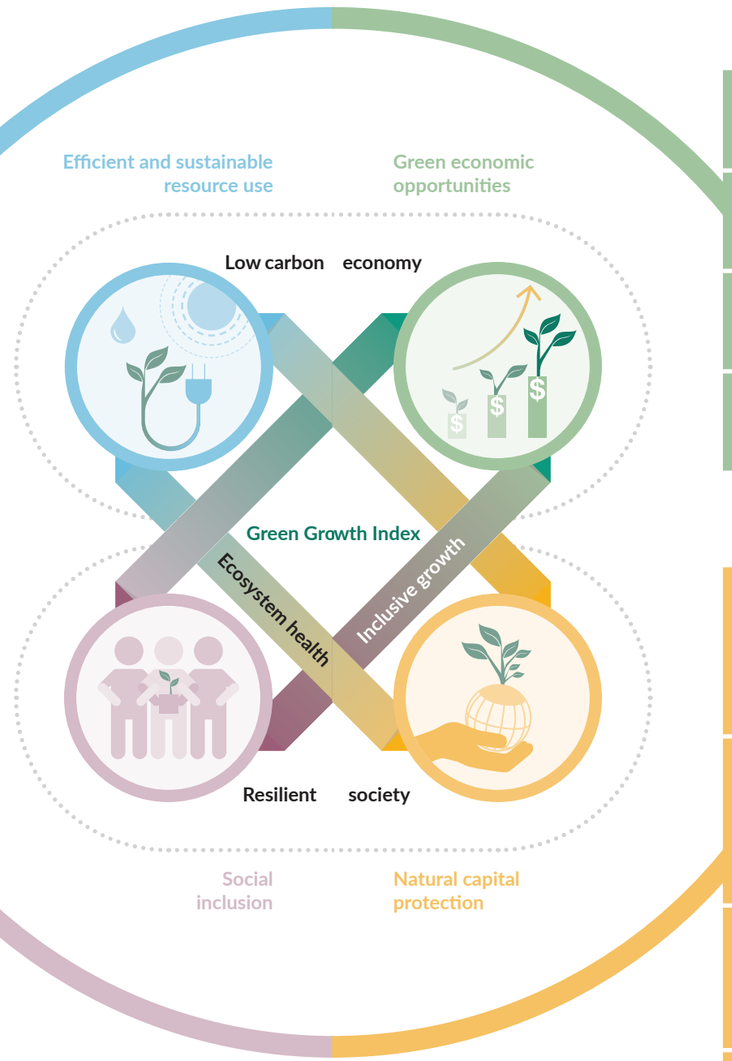
More than 300 experts representing different organizations from various regions around the world participated in the review of the green growth framework for the Index. Expert feedback was assessed through iterative steps during three phases of Index development since 2017. This feedback was collected through workshops, expert group meetings, consultations, and an online survey.



1.2 Features of the Green Growth Index

The Green Growth Index is framed on four closely interlinked dimensions: (1) efficient and sustainable resource use; (2) natural capital protection; (3) green economic opportunities; and (4) social inclusion. Their interlinkages build on the concepts of low carbon economy, ecosystem health, inclusive growth and resilient society.

Ratio of total primary energy supply to GDP (MJ per $2011 PPP GDP)	EE1	Efficient and sustainable energy
Share of renewables to total final energy consumption (Percent)	EE2	
Water use efficiency (USD per m^3)	EW1	Efficient and sustainable water use
Share of freshwater withdrawal to available freshwater resources (Percent)	EW2	
Average soil organic carbon content (Tons per hectare)	SL1	Sustainable land use
Share of organic agriculture to total agricultural land area (percent)	SL2	
Total domestic material consumption (DMC) per unit of GDP (DMC kg per GDP)	ME1	Material use efficiency
Total material footprint (MF) per capita (MF tons per capita)	ME2	
Population with access to safely managed water and sanitation (Percent)	AB1	Access to basic services and resources
Population with access to electricity and clean fuels/technology (Percent)	AB2	
Fixed Internet broadband and mobile cellular subscriptions (Number per 100 people)	AB3	
Proportion of seats held by women in national parliaments (Percent)	GB1	Gender balance
Ratio of female to male with an account in a financial institution, age 15+ (Percent)	GB2	
Getting paid, covering laws and regulations for equal gender pay (Score)	GB3	
Inequality in income based on Atkinson (Index)	SE1	Social equity
Ratio of urban to rural, access to safely managed water/ sanitation & electricity (Percent)	SE2	
Share of youth not in education, employment or training, aged 15-24 years (Percent)	SE3	
Proportion of population above statutory pensionable age receiving pension (Percent)	SP1	Social protection
Healthcare access and quality index (Index)	SP2	
Proportion of urban population living in slums (Percent)	SP3	



Green investment	GV1	Adjusted net savings, minus natural resources and pollution damages (Percent GNI)
Green trade	GT1	Share of export of environmental goods (OECD & APEC class.) to total export (Percent)
Green employment	GJ1	Share of green employment in total manufacturing employment (Percent)
Green innovation	GN1	Share patent publications in environmental technology to total patents (Percent)
Environmental quality	EQ1	PM2.5 air pollution, mean annual population-weighted exposure (micrograms per m^3)
	EQ2	DALY rate as affected by 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 CO_2 emissions to population, excluding AFOLU (Metric tons per capita)
	GE2	Ratio non-CO_2 emissions to population, excluding AFOLU (Tons per capita)
	GE3	Ratio non-CO_2 emissions in agriculture to population (Gigagrams per 1000 persons)
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	Soil biodiversity, the potential level of diversity living in soils (Index)
Cultural and social value	CV1	Red list index (Index)
	CV2	Tourism and recreation in coastal and marine areas (Score)
	CV3	Share of terrestrial and marine protected areas to total territorial areas (Percent)

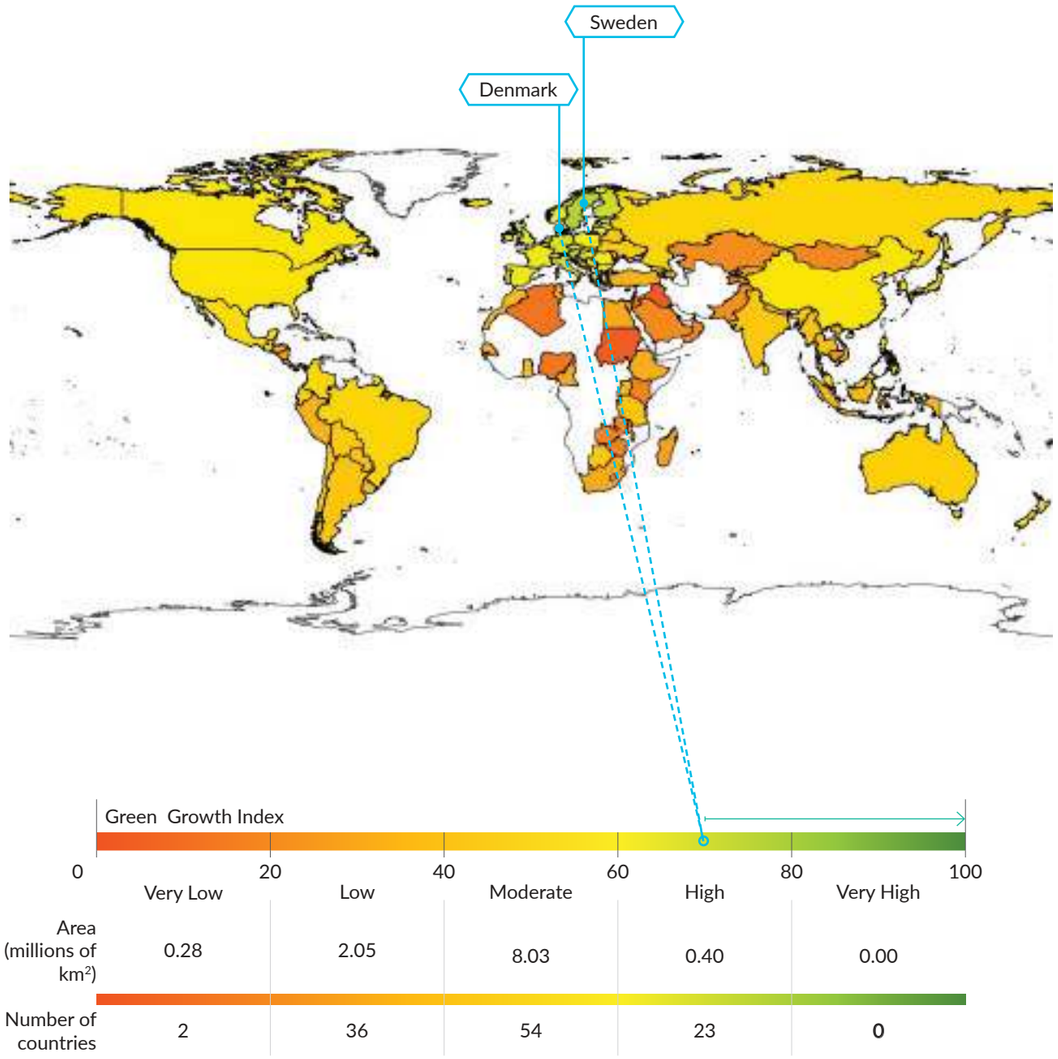
Acronyms used in this report

AB	Access to Basic Services and Resources
AFOLU	Agriculture, Forestry, and Other Land Use
APEC	Asia-Pacific Economic Cooperation
BE	Biodiversity and Ecosystem Protection
CO_2	Carbon Dioxide
CV	Cultural and Social Value
DALY	Disability-Adjusted Life Year
EE	Efficient and Sustainable Energy
EQ	Environmental Quality
EW	Efficient and Sustainable Water Use
GB	Gender Balance
GDP	Gross Domestic Product
GE	GHG Emission Reductions
GGGI	Global Green Growth Institute
GGPM	Green Growth Performance Measurement
GJ	Green Employment
GN	Green Innovation
GNI	Gross National Income
GT	Green Trade
GV	Green Investment
LAC	Latin America and the Carribean
ME	Material Use Efficiency
MENA	Middle East and North Africa
MF	Material Footprint
MSW	Municipal Solid Waste
OECD	Organisation for Economic Co-operation and Development
PM2.5	Particulate matter with a diameter of less than 2.5 micrometers
SDGs	Sustainable Development Goals
SE	Social Equity
SL	Sustainable Land Use
SP	Social Protection
USD	United States Dollar

2 Less than 25% of the 115 countries ranked in the Index are close to reaching sustainability targets for green growth

2.1 Distance from targets

Out of the 23 countries scoring high in the 2019 Green Growth Index, Denmark and Sweden rank highest, both with scores of about 75. But these top scores are still 25 points from the green growth target of 100. With 54 countries still halfway to reaching this target and 38 even further behind, there are ample opportunities to improve performance and make the world a greener place.



2.2 Top performers by region

Top ranks in other regions include Singapore in Asia, the Dominican Republic in the Americas, New Zealand in Oceania, and Botswana in Africa, all achieving moderate scores. Like in Europe, top ranks in the Americas and Africa are highly challenged by countries next in line. In contrast, Singapore and New Zealand firmly secure top ranks in their respective regions, at least 2 points ahead of other countries.

EUROPE	Rank	Index
Denmark	1	75.32
Sweden	2	75.09
Austria	3	72.32
Finland	4	71.69
Czech Republic	5	71.29
Italy	6	70.22
Germany	7	70.04
Estonia	8	68.50
Latvia	9	68.24
Slovakia	10	67.60
Portugal	11	66.32
Belgium	12	64.94
Hungary	13	64.82
France	14	64.66
Croatia	15	64.49
Slovenia	16	64.00
Spain	17	63.67
Lithuania	18	63.65
Netherlands	19	63.38
United Kingdom	20	63.30
Switzerland	21	62.72
Norway	22	62.10
Poland	23	61.67
Romania	24	59.41
Ireland	25	58.68
Luxemburg	26	58.64
Greece	27	57.42
Bulgaria	28	56.87
Iceland	29	54.42
Serbia	30	52.43
Albania	31	51.66
Russia	32	49.60
Ukraine	33	46.56
Belarus	34	44.76
Montenegro	35	40.41
Republic of Moldova	36	38.68
Bosnia and Herzegovina	37	34.98
Malta	38	28.13

ASIA	Rank	Index
Singapore	1	58.43
Malaysia	2	55.88
Philippines	3	55.54
Georgia	4	55.45
China	5	55.41
Republic of Korea	6	54.31
Japan	7	53.86
Sri Lanka	8	52.74
India	9	45.58
Azerbaijan	10	44.98
Myanmar	11	44.55
Thailand	12	44.36
Cyprus	13	44.03
Nepal	14	43.54
Israel	15	42.14
Indonesia	16	40.81
Lebanon	17	39.45
Turkey	18	39.22
Viet Nam	19	39.05
Kyrgyzstan	20	36.74
Armenia	21	35.55
Qatar	22	34.73
Cambodia	23	30.13
Pakistan	24	29.08
Kazakhstan	25	28.10
Saudi Arabia	26	27.92
Mongolia	27	27.33
Jordan	28	26.71
Oman	29	26.25
Tajikistan	30	25.00
Kuwait	31	24.62
Iraq	32	17.32

OCEANIA	Rank	Index
New Zealand	1	52.17
Australia	2	47.89
Fiji	3	45.48

THE AMERICAS	Rank	Index
Dominican Republic	1	55.10
United States	2	54.22
Canada	3	54.04
El Salvador	4	53.94
Mexico	5	52.71
Colombia	6	50.77
Costa Rica	7	50.63
Brazil	8	49.82
Ecuador	9	48.87
Guatemala	10	46.77
Chile	11	46.58
Bolivia	12	46.10
Argentina	13	45.21
Paraguay	14	43.72
Honduras	15	43.08
Uruguay	16	42.99
Bahamas	17	41.36
Peru	18	39.55
Panama	19	38.29
Nicaragua	20	32.74
Trinidad and Tobago	21	29.99

AFRICA	Rank	Index
Botswana	1	45.88
Tanzania	2	44.32
Mauritius	3	42.63
Morocco	4	42.61
Ghana	5	42.42
Uganda	6	40.96
Tunisia	7	38.88
Senegal	8	38.17
Ethiopia	9	37.48
Egypt	10	36.74
South Africa	11	36.62
Cameroon	12	35.30
Madagascar	13	33.79
Malawi	14	26.89
Zambia	15	26.89
Kenya	16	26.19
Zimbabwe	17	25.71
Burundi	18	25.22
Nigeria	19	22.84
Algeria	20	22.36
Sudan	21	16.96

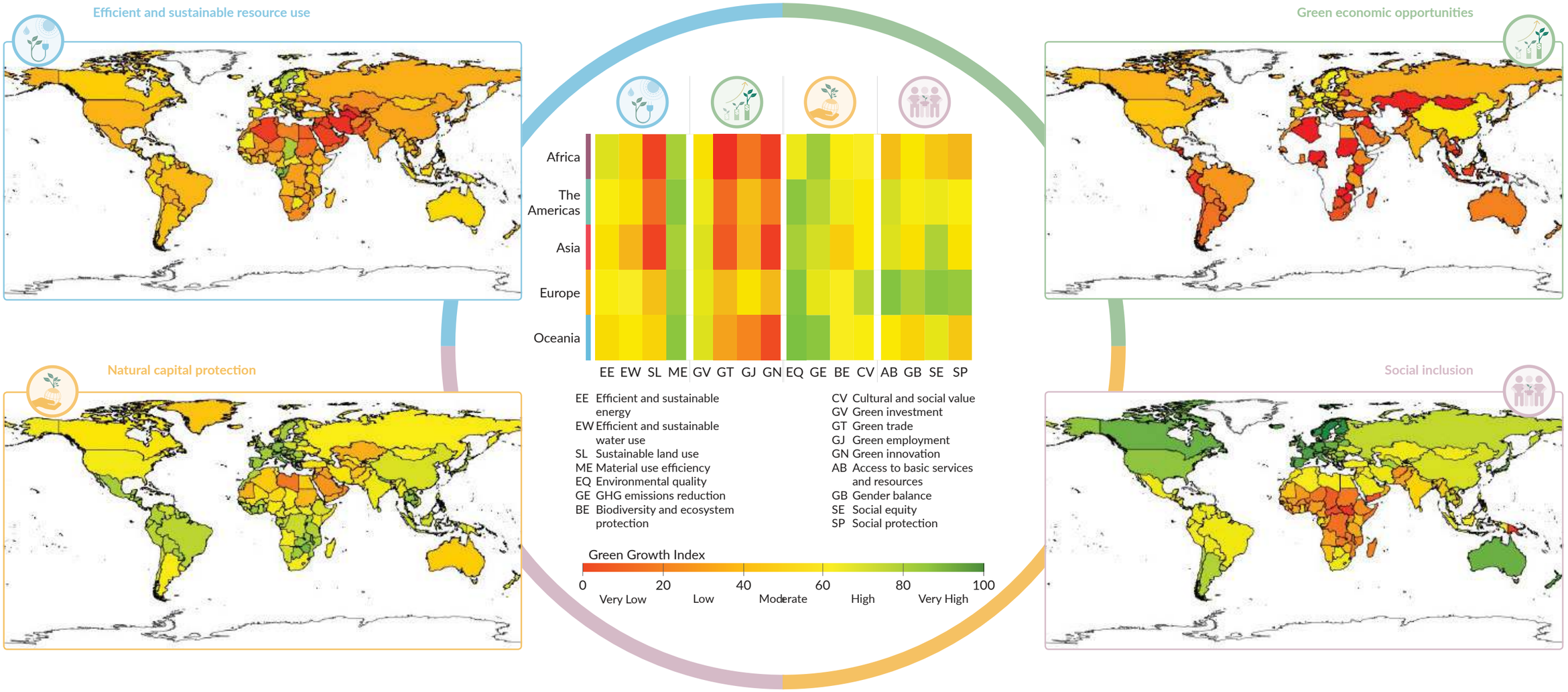
Country classification by region is based on the United Nations geoscheme (Source: https://unstats.un.org/unsd/methodology/m49/)

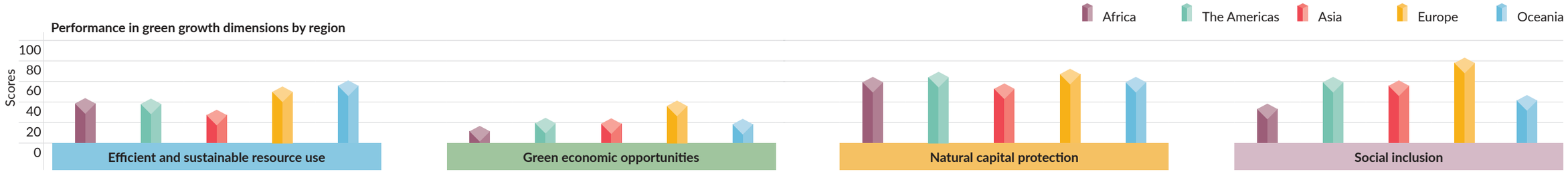
2.3 Performance on Index dimensions

Among the four green growth dimensions, performance is lowest for many countries for efficient and sustainable resource use, and green economic opportunities. Average scores for efficient and sustainable resource use are lowest for countries in Northern Africa as well as in Central and Western Asia.

2.4 Regional green growth challenges

Lack of green trade and innovation is the main constraint to reaching the targets for green economic opportunities across all regions. In addition, poor sustainable land use hinders efforts to improve performance in efficient and sustainable resource use, particularly in many countries in Africa, the Americas, and Asia.

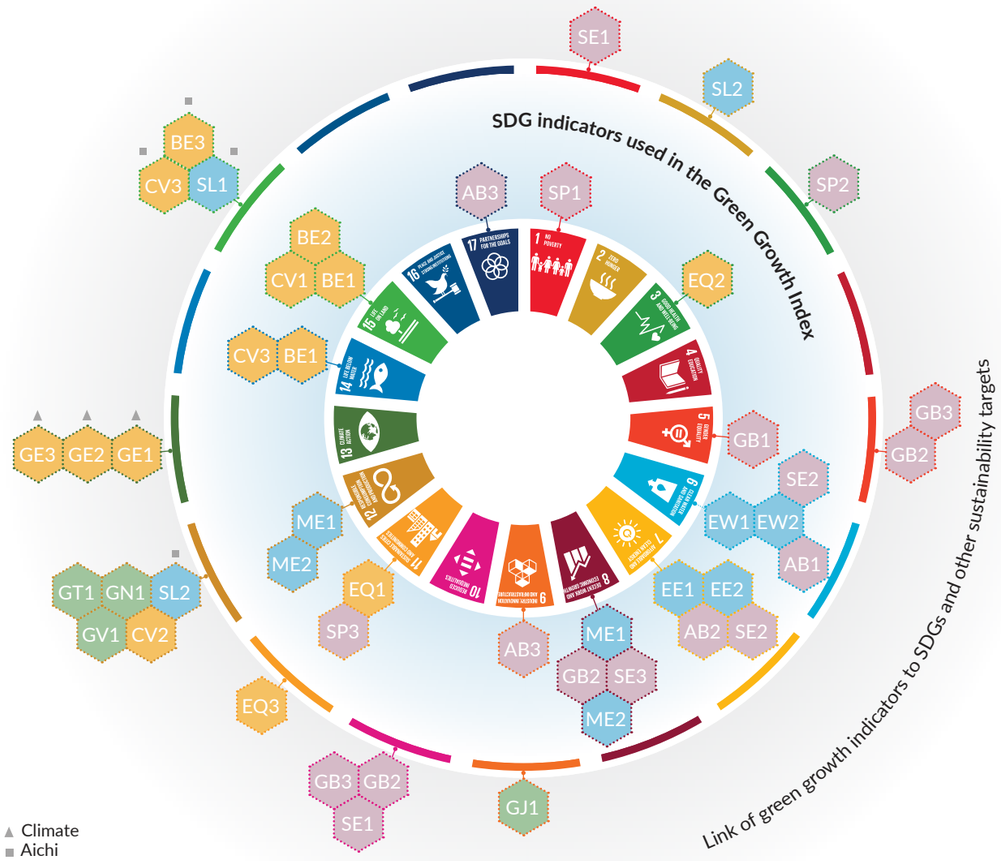




3 Gaps in SDG indicators to track performance in green economic opportunities is a challenge to developing the Index

3.1 Sustainability targets

Twenty-one indicators of the Green Growth Index are directly derived from the SDGs. The remaining fifteen, while not SDGs indicators, contribute to achieving the SDGs, the Paris Agreement on Climate, and Aichi targets. The Index is the first to benchmark green growth performance against the targets of these international agreements.

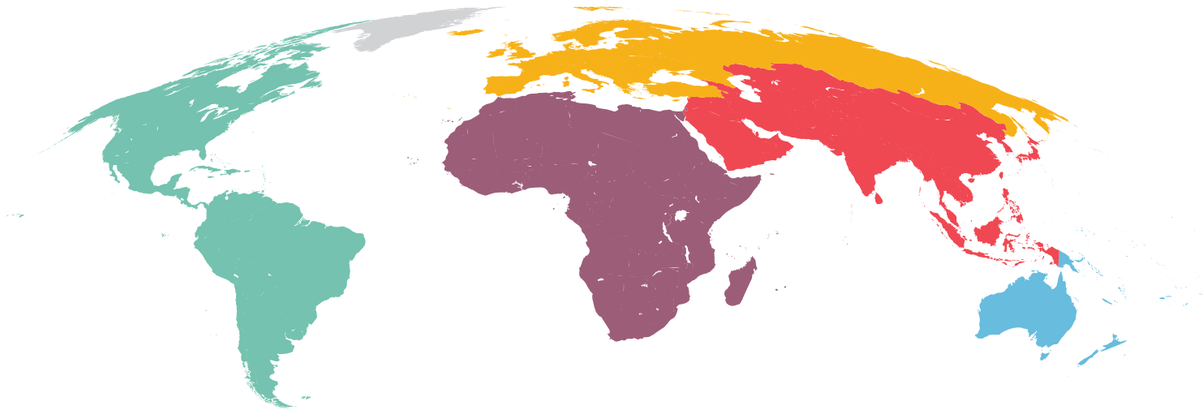


Efficient and sustainable resource use | Natural capital protection | Green economic opportunities | Social inclusion

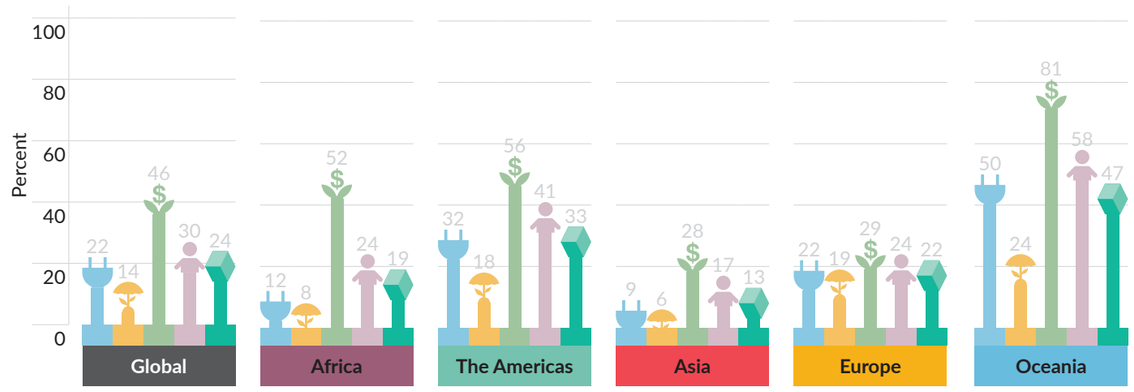
EE1	Ratio of total primary energy supply to GDP	EQ1	PM2.5, mean annual population-weighted exposure	AB1	Access to safely managed water and sanitation
EE2	Share of renewables to total final energy consumption	EQ2	DALY rate due to unsafe water sources	AB2	Access to electricity, and clean fuels and technology
EW1	Water use efficiency	EQ3	Municipal solid waste generation per capita	AB3	Internet broadband and mobile cellular subscriptions
EW2	Share of freshwater withdrawal to available freshwater	GE1	CO_2 emissions per capita, excl. AFOLU	GB1	Seats held by women in national parliaments
SL1	Average soil organic carbon content	GE2	Non-CO_2 emissions per capita, excl. AFOLU	GB2	Ratio of female to male with a financial account
SL2	Share of organic agriculture to agriculture area	GE3	Non-CO_2 emissions in agriculture per capita	GB3	Laws and regulations for equal gender pay
ME1	Total domestic material consumption per GDP	BE1	Proportion of KBAs covered by protected areas	SE1	Inequality in income based on Atkinson
ME2	Total material footprint per GDP	BE2	Share of forest area to total land area	SE2	Ratio urban-rural, safe water/sanitation and electricity
GV1	Adjusted net savings	BE3	Soil biodiversity, the potential level of diversity	SE3	Youth not in education, employment or training
GT1	Share of environmental goods	CV1	Red list index	SP1	Proportion of population receiving pension
GJ1	Share of green employment in manufacturing	CV2	Tourism and recreation in coastal and marine areas	SP2	Healthcare access and quality index
GN1	Share of environmental technology to total patents	CV3	Share of terrestrial & marine protected areas to territorial areas	SP3	Proportion of urban population living in slums

3.2 Information gaps

There is a large information gap for the green economic opportunities dimension. First, there is no single indicator for it with sufficient data in the SDGs. Second, due to a lack of data, only four indicators outside the SDGs could be included for this dimension. Third, among the four dimensions, indicators for green economic opportunities have the largest data gaps across all regions. Finally, the concept of "green" economic opportunities remains ill-defined.



Data gaps in green growth indicators



Efficient and sustainable resource use | Natural capital protection | Green economic opportunities | Social inclusion | Green Growth Index

4 Rising momentum for green growth offers huge opportunity for global actions to reach targets and close gaps

4.1 Sharing Expertise

Experts who participated in the consultation process reflected on opportunities for applications of the Index in their respective countries and regions. GGGI is committed to supporting policymakers and practitioners in applying the Index at the regional, national, and sub-national levels to catalyze green growth transition.


International expert group from Switzerland


International expert group from Rome


Experts from Middle East and North Africa


Experts from Latin America and the Caribbean


Experts from Africa


Experts from Asia Pacific

4.2 Global Partnerships

Experts from many international development and research organizations have joined the international expert group for the Green Growth Performance Measurement Program, which GGGI formed to support the development of the Index. GGGI will continue to work with the expert group to further improve the Index framework and highlight data gaps in green growth indicators.

4.3 Ongoing collaborations

GGGI is currently collaborating with the United Nations Environment Programme to emphasize complementarity between the Green Growth Index and Green Economy Progress Index. Moreover, it collaborates with the African Development Bank to develop the second phase of the African Green Growth Index using GGGI's green growth framework.

Summary of Key Messages

1 GGGI's Green Growth Index was designed through a rigorous and inclusive process. The process was guided by a bottom-up approach and multiple iterative steps in consultation with experts working on indicators, metrics, and green growth policies in their respective organizations. To ensure its robustness and policy relevance, GGGI developed and improved the Index through multiple revisions of the conceptual and methodological frameworks based on the assessment of the expert feedback.

The indicators that were selected for the four dimensions of green growth have undergone systematic assessment, with regional experts rating their policy relevance to different countries and regions. International and GGGI expert groups then reviewed the assessment results to define sets of indicators that are applicable to measure green growth performance at the global level, as well as aligned with GGGI's six strategic outcomes and four thematic priority areas of sustainable energy, green cities, sustainable landscapes, and water and sanitation. As a result of this process, the green growth framework developed for the Index is directly applicable for tracking green growth performance at the national, regional, and global levels.

2 Roughly half of the ranked countries have moderate performance in attaining their green growth targets, and low-performing countries still outnumber high-performing ones. The call for action to increase efforts in making the world "greener" is growing, and all countries can now work towards identifying areas where opportunities for improving green growth performance are most abundant.

Regionally, Europe leads the world in green growth performance. Africa, on the other hand, is the region where green growth work remains imperative, but also where opportunities for the most conceivable impacts are most significant. Continued enhancement of local skills and infrastructure can help improve Africa's green growth performance. The switch to more efficient technologies also offers the region opportunities for leapfrogging to a greener future.

Across regions, improving green economic opportunities present the largest prospects for performance improvement, and can be targeted through innovation and green trade. For countries in Africa, the Americas and Asia, enhancements in efficient and sustainable resource use will enable better green growth performance through more sustainable land use.

3 The Index is the first metric for green growth that explicitly links to sustainable development. In order to make the Index relevant at the national and international level, it has been essential for GGGI to align the Index with global sustainability goals and targets such as the SDGs, the Paris Agreement, and Aichi biodiversity targets. This complementary set of internationally accepted targets and related indicators serve as a reliable reference for the Green Growth Index and allow governments to align their pathway to green growth with achieving the SDGs, and national climate and biodiversity goals.

For the Green Growth Index to be wide-reaching and support transformational impact on a global scale, it is imperative that this broad set of indicators is supported by high-quality data. In particular, data gaps for green economic opportunities need to be addressed across all regions, but most urgently in Oceania and Africa. As one of the dimensions of green growth with the most potential for improving green growth performance across regions, improving data availability for green economic opportunities can help catalyze meaningful progress and impact. Complete data for green economic opportunities would also increase the global coverage of the Green Growth Index from 115 to 207 countries.

4 To date, there is no universal definition of green growth, thus resulting in different ways of measuring related targets. GGGI is bridging the gap by developing a common understanding of green growth performance through the Green Growth Index.

GGGI is contributing to the increasing momentum for green growth through collaborative efforts to increase the applicability of the Index. The participatory Index development process opened new doors to enhance collaborative work on green growth and sustainable development. GGGI has strengthened collaboration not only with its Member countries but also with various international organizations that jointly support global and national sustainability targets. Today, the United Nations Environment Programme and the African Development Bank have partnered with GGGI to benefit from its experience with the Green Growth Index and to further increase understanding and engagement on green growth.

GGGI is also complementing the Green Growth Index with a "Policy Simulation Tool." The purpose of the Tool is to estimate the impact of different policies on country performance within the Green Growth Index framework. The Simulation Tool will further improve the policy relevance of the Index.

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