GGGI Technical Report No. 8

ASSESSMENT OF FEEDBACK FROM REGIONAL EXPERT CONSULTATIONS ON THE GREEN GROWTH INDEX (PHASE 2)

OCTOBER 2019

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Assessment of Feedback from Regional Expert Consultations on The Green Growth Index (Phase 2)

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Please cite this publication as:
Acosta, L.A., R.J. Mamiit, C. Ho, I. Gunderson, O. Anastasia, M. Angawi, C.O. Balmes, N. Desta, N. Krairiksh, H.W. Lakew, J.L.A. Loustaunau, P. Martinez, K. Ram-Indra, and C. Shrestha. 2019. Assessment of feedback from regional expert consultations on the Green Growth Index (Phase 2). Technical Report No. 6, Green Growth Performance Measurement, Global Green Growth Institute, Seoul, Korea. [Contributors: S.G. Quiñones, E. Eugenio, and D.J.J. Valencia]

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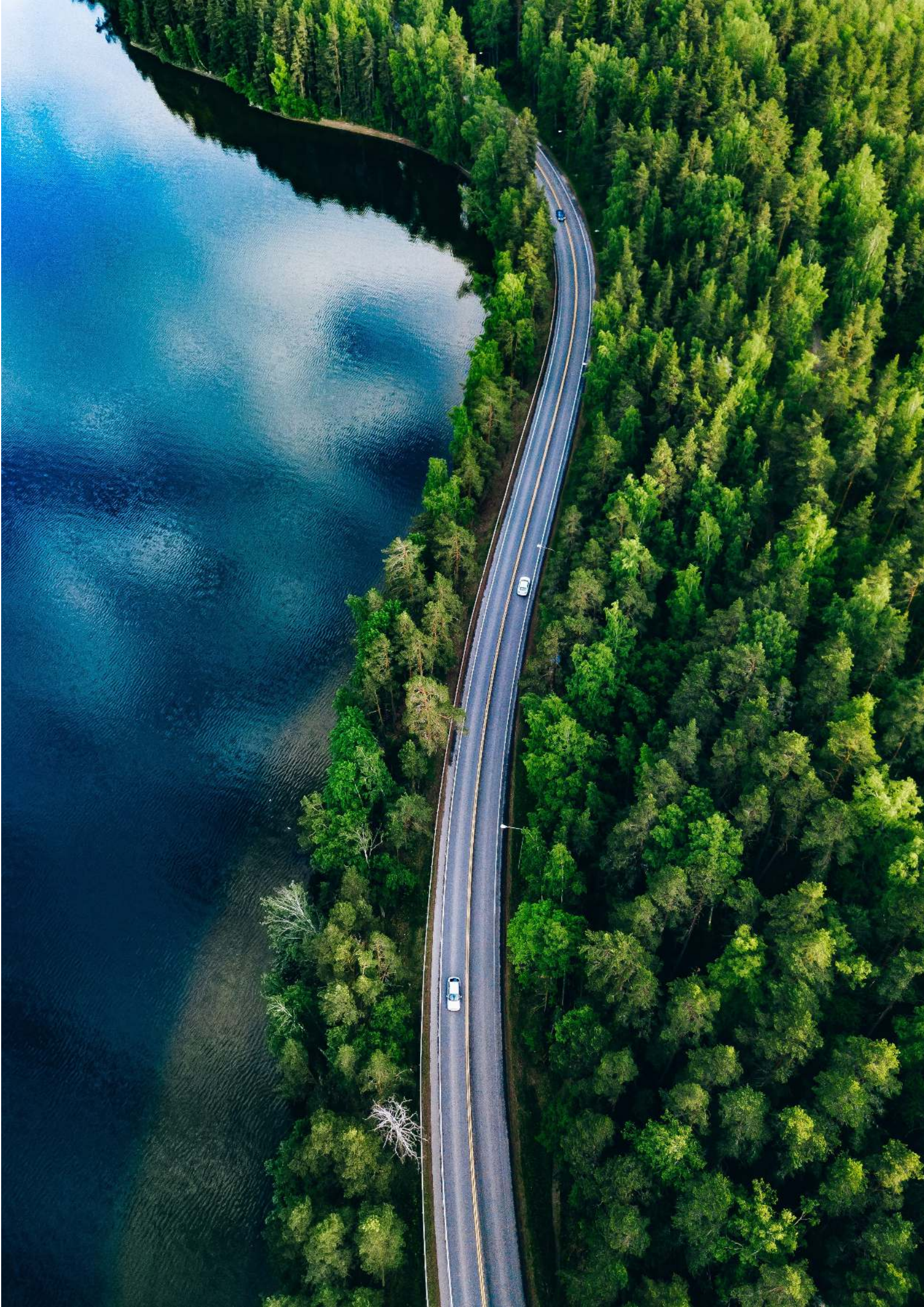
LIST OF ACRONYMS

ADB	Asian Development Bank
AfDB	African Development Bank
AHP	Analytical Hierarchy Process
CSA	Climate smart agriculture
DALY	disability-adjusted life years
DRR	disaster risk reduction
GDP	gross domestic product
GGGI	Global Green Growth Institute
GGKP	Green Growth Knowledge Platform
GGPM	Green Growth Performance Measurement
GVA	gross value added
LAC	Latin America and Caribbean
MENA	Middle East and North Africa
OECD	Organisation for Economic Co-operation and Development
PAGE	Partnership for Action on Green Economy
SDG	Sustainable Development Goal
UAE	United Arab Emirates
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNISDR	United Nations International Strategy for Disaster Reduction
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
VOC	Volatile organic compounds
WB	World Bank



1 INTRODUCTION

Policymakers increasingly recognize and pursue green growth (or green economy) as a pathway to sustainable development (WB, 2012)(Makumbe, 2012); Organisation for Economic Co-operation and Development [OECD] 2014; Bi, Xiao, & Sun 2018; Godoy2018). Various uncoordinated and separate efforts have been undertaken to measure progress in greening economic production and consumption at the regional, subregional, national, and subnational levels (Hur, Kim, & Yamamoto 2004; Slaper & Krause 2009; Green Growth Knowledge Platform [GGKP] 2013; United Nations Environment Programme [UNEP] 2012a; Joshi & Rahman 2015). However, a comparative measurement of performance across countries remains a challenge due to not only the lack of a broadly understood concept of green growth (OECD 2012; Jacobs 2012; Bowen 2012), but also the lack of globally available indicators to operationalize this concept (Hirschnitz-Garbers & Srebotnjak, 2012; Narloch, Kozluk, & Lloyd 2016; OECD 2017). This is attributed to the complex nature and multi-dimensional aspects of green growth (Jacobs 2012; Bowen 2012; Ahlert, Meyer, Zieschank, Diefenbacher, & Nutzinger 2013; GGKP 2013; Narloch et al. 2016).

The Global Green Growth Institute (GGGI) has taken a significant step to address this challenge by gathering more than 80 policymakers and experts from about 30 countries to participate in four regional consultation workshops. The workshops for the Asia-Pacific, Middle East and North Africa (MENA), Africa, and Latin America and Caribbean (LAC) regions took place between August and October 2018. GGGI invited the policymakers and experts to share their understanding of green growth from their own country perspectives as part of GGGI's efforts to develop a comprehensive Green Growth Index. This technical report focuses on the second draft framework of the index that was developed through the GGGI's Green Growth Performance Measurement (GGPM) Program in early 2018 and presented during the regional workshops.

The GGPM Program has used the experts' collective knowledge as input to the Green Growth Index and the Simulation Tool. The index and the tool are being developed to support an integrated assessment of green growth policies and their impacts on green growth performance. The second draft framework of the index is designed to measure country-level performance based on a common set of metrics in five green growth dimensions: resource efficiency, natural capital protection, resilience to risks, green economic opportunities, and social inclusion. The Simulation Tool is designed to allow users to enhance their knowledge on how different policy options within these dimensions influence a country's green growth performance. The Green Growth Index and the Simulation Tool are integrated approaches, and so the validity of the underlying models and assumptions of the tool depend on the policy relevance of indicators that frame the index.

This technical report presents the outcome of the four regional consultation workshops that were conducted through the GGPM Program to validate and enhance the policy relevance of GGGI's conceptual framework for the Green Growth Index. The main goal of the consultations was to ensure an inclusive and collaborative process in developing the Green Growth Index, which integrates expert preferences and priorities as well as creates a platform for the transparent development of the index. The stakeholder feedback was intended to provide a critical opportunity to determine how to make the index as useful and relevant as possible to policymakers. This technical report aims to assess how policymakers and other stakeholders understand green growth, why knowledge on green growth diverges across regions, and what common understanding can be integrated in the green growth framework to enhance relevance of the index for policy decision-making.

The report is structured as follows: Section 2 presents the concept of the Green Growth Index and describes the methods for assessing expert opinion on the concept; Section 3 presents the results of the assessment; Section 4 discusses expert preferences for conceptualizing green growth and gaps in operationalizing these preferences; and Section 5 provides conclusions on how to further improve GGGI's Green Growth Index.

2 ANALYTICAL APPROACH

2.1. GGGI's concept of green growth

The concept behind the Green Growth Index builds on the definition of green growth. Prior to GGGI's refreshed 2016-2020 Strategy (GGGI 2017), the definition was based on the joint research of experts from the GGKP Research Committee on Measurement and Indicators (GGKP 2013). It emphasizes economic growth that is environmentally sustainable and socially inclusive (Figure 1). A sustainable environment can be achieved through the efficient use of resources and protection of natural capital, while social inclusion can be enhanced through the creation of green economic opportunities for the different sectors of the economy and different parts of the society. Environmentally sustainable and socially inclusive growth will help create a low-carbon and climate-resilient economy and society, and vice versa.

The second draft framework builds on the work initiated by the GGKP (Narloch, Kozluk, & Lloyd, 2016) which emphasizes five main themes of relevance for measuring inclusive green growth:

(i) Natural assets;
(ii) Resource efficiency and decoupling;
(iii) Risks and resilience;
(iv) Economic opportunities/efforts; and
(v) Inclusiveness.

These five themes or dimensions are used for the Green Growth Index because they convey relevant and differentiated information about what constitutes green growth. Resource efficiency, or the efficient use of resources, is an essential component of green growth. It accounts not only for the quantity of resources being consumed but also for how efficiently they are being consumed. Resource depletion is a major concern for the long-term sustainability of societies as many economic activities rely on them. Natural capital protection refers to our efforts in maintaining our environment and ecosystems in good health to support and allow life to thrive. Green economic opportunities monitor the shift of our societies to create and foster more sustainable economic activities and employment which have positive rather than negative environmental impacts. The social inclusion dimension evaluates how all members of society gain access to these new opportunities and take part in social growth. Finally, resilience dimension involves monitoring the capability of governments and communities to prevent, prepare for, recover from, and adapt to various risks.

Figure 1. Definition of Green Growth

GGGI's definition of green growth

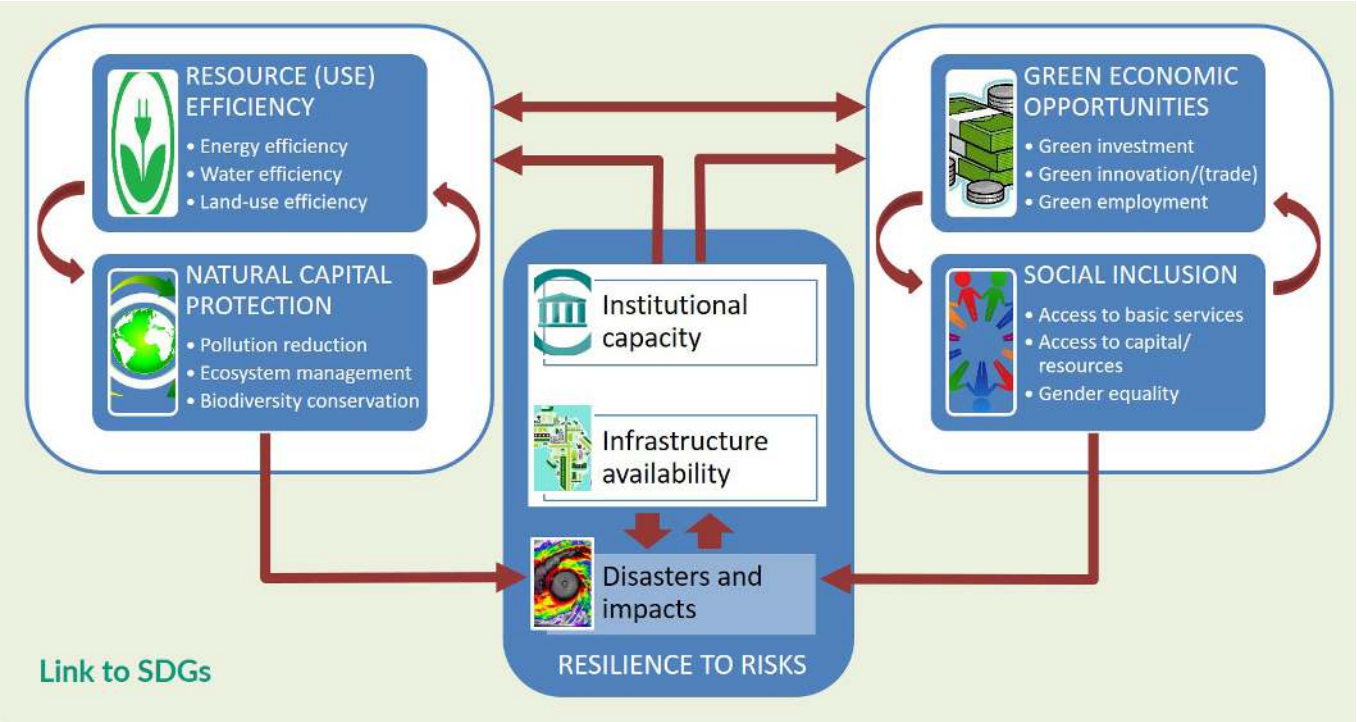
Green growth is a development approach that seeks to deliver economic growth that is both environmentally sustainable and socially inclusive.

GGGI seeks opportunities for economic growth that are:

- low-carbon and climate resilient,
- prevent or remediate pollution,
- maintain healthy and productive ecoystems,
- create green jobs,
- reduce poverty and
- enhance social inclusion

These five themes are structured to form the conceptual framing of the Green Growth Index (Figure 2). Resource use and efficiency and natural capital protection represent efforts to enhance environmental sustainability. Green economic opportunities and social inclusion represent efforts toward socio-economic development. The central theme is the dimension on resilience, representing how strong, adaptable, and sustainable communities and the environment are in the face of multifaceted risks, such as climate impacts and biodiversity loss. For example, addressing both resilience and resource efficiency in urban areas has the potential to generate social, economic, and environmental returns far beyond those which could be achieved by addressing these agendas separately (Dodman et al. 2017). With enhanced resilience, natural capital has a greater ability to persist and adapt in the face of change, continue to provide ecosystem services, and adapt and transform in beneficial ways (Guerry et al. 2015). Similarly, enhancing society's resilience will only be possible by maintaining and enhancing ecosystem resilience as social,

Figure 2. Conceptual framework for the Green Growth Index



economic, and ecological sustainability are interdependent (EEA, 2015). Institutions and infrastructure enhance resilience not only through pre-disaster mitigation and post-disaster adaptation but also through the creation of an enabling environment for resource efficiency (United States Agency for International Development [USAID], 2019), natural capital protection (Amjad, Ojomo, Downs, Cronk, & Bartram 2015), green economic opportunities (UNDESA, ESCAP, ILO, & UNEP, 2012), and social inclusion (United Nations Children's Fund [UNICEF], 2016). From an institutional perspective, an enabling environment relates to competence on political leadership, capacity to implement policies and regulations, facilitation of stakeholders' participation, etc. (Fioramonti & Kononykhina 2014).

2.2. Methods

2.2.1. Focus of Analysis: Green Growth Indicators

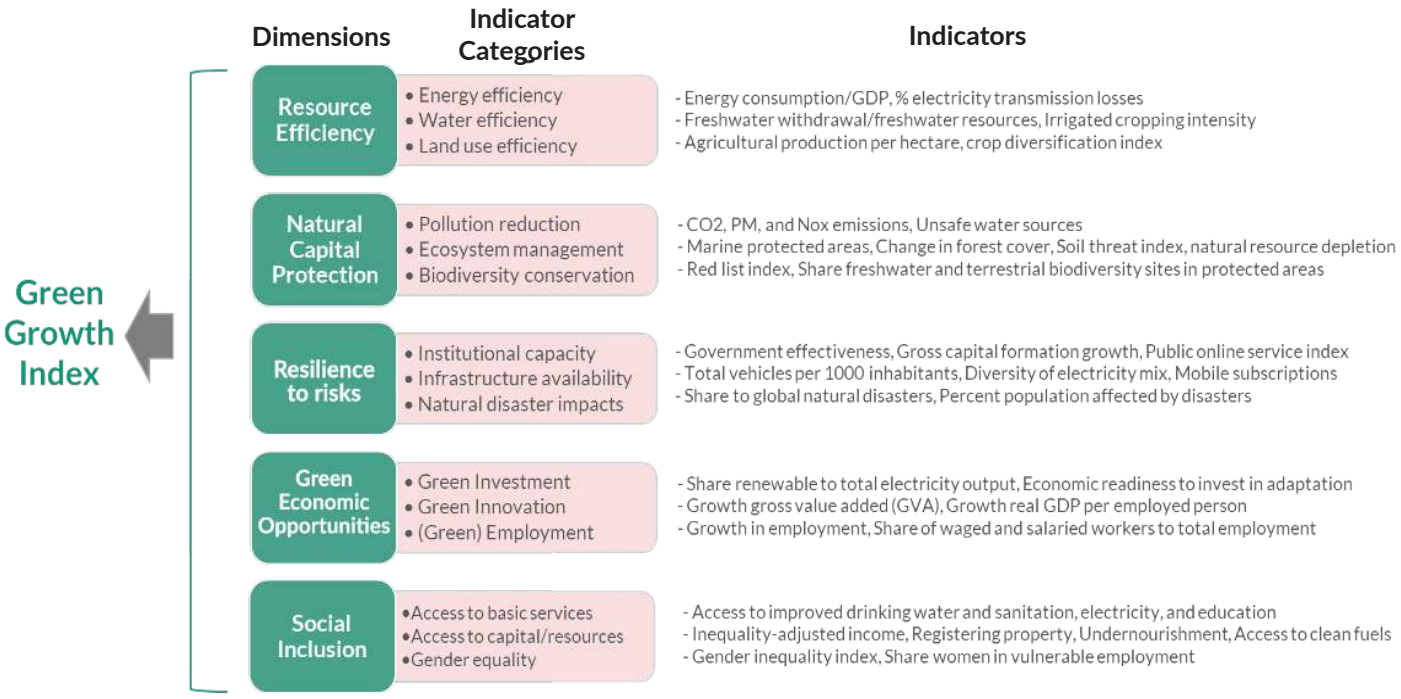
This report focuses on the analysis of the indicators for each green growth dimension. GGGI identified the preliminary list of green growth indicators from a literature review and expert judgement (Figure 3). Appendix 1 provides details on the indicators and their data sources.

The available literature provided different definitions for green growth (OECD 2011, WB 2012, UNEP 2012b) and different perspectives of analysis (United Nations Economic and Social Commission for Asia and the Pacific [UN ESCAP] 2013, Partnership for Action on Green Economy [PAGE] 2017a&2017b, Tamanini & Valenciano 2016, African Development Bank [AfDB] 2014, Jha, Sandhu, & Wachirapunyanont 2018) resulting in a diverse set of indicators used to capture green growth's concept. For example, the Asian Development Bank (ADB) developed inclusive green growth indices for the Asia-Pacific region, which emphasize social inclusiveness by adopting more indicators on social equity —twice as many indicators as compared to economic growth and environmental sustainability (Jha et al. 2018). The indicators for the UNEP and Dual Citizen's indices diverge in their conceptual perspectives: the former focuses on progress achieved through an inclusive green economy, while the latter focuses on green economic performance. Moreover, the UNEP measures performance using expert judgement on the green economy narrative in addressing three main global challenges — persistent poverty, overstepped planetary boundaries, and inequitable sharing of growing prosperity — whereas Dual Citizen's built its performance measurement on practitioner perceptions on different green economy dimensions, such as leadership and climate change, efficiency sectors, markets and investment, and the environment (PAGE 2017b& 2017a, Tamanini & Valenciano 2016).

Green growth entails complex and multidimensional changes in the economy, the society, and the environment. This makes the tasks of identifying relevant indicators particularly challenging (GGKP, 2013)[2].

[2] *A comparison of indices related to green growth is available elsewhere (Galotto & Acosta, 2019) and will not be addressed in detail in this report.*

Figure 3. Dimensions and indicators of the second draft framework of the Green Growth Index



2.2.2. Data collection: Expert consultations

Participants and organizers

To validate the policy relevance of the indicators, opinions and expert judgments were collected from the participants in four regional consultation workshops that GGGI conducted between August and October 2018 (Table 1). The main participants included government officials who are working on or have expertise in green growth issues. Many of the participating government officials have working relationships with GGGI country offices. Experts from international organizations and research institutions that support green growth knowledge generation, planning, policy development, and investment in GGGI member countries and partners also participated in the workshops.

The regional workshops were conducted in close collaboration with different organizations, including UNESCAP in Bangkok, the Ministry of Climate Change and Environment in Dubai, and the Ministry of Environment in Mexico City. The workshops were supported by the GGGI country representatives and officers in Bangkok, Dubai, Addis Ababa, and Mexico City, where the workshops took place. There were 86 experts from 28 countries who participated in the workshops. Of this number, about 74 percent work in government (Table 1, Details of the participants are in Appendix 2). These numbers do not include the 15 GGGI staff who conducted and supported the regional workshops. The GGGI country offices and partners identified the experts and invited them to participate in the workshops. About 14 countries were not able to participate mainly due to the experts' busy schedules or the government's other important priorities at the time of the workshops.

Structure of the workshops

The structure of the two-day consultations followed a similar format in all regions. The consultations comprised the following:

- Welcome remarks to emphasize the goal and importance of the workshop;
- Thematic presentations to inform experts on the concept and methods of the Green Growth Index;
- Breakout sessions for experts to discuss the questions raised during the presentations;
- Reporting and write-up sessions for experts to share their opinions on the questions to the workshop participants; and
- Concluding remarks.

Table 1. International and regional consultation workshops in 2018

Geographical coverage	Date	Location	Partners	Countries represented*	Number of experts**	
					Government	Others
Asia-Pacific	23-24 August	United Nations Conference Centre in Bangkok, Thailand	U.N. Economic and Social Commission for Asia and the Pacific; GGGI country office in Thailand	Cambodia, China, Indonesia, Laos, Mongolia, Myanmar, Nepal, Papua New Guinea, the Philippines, Thailand, Vanuatu, Vietnam	15	7
Middle East and North Africa (MENA)	16-17 September	Ministry of Climate Change and Environment in Dubai, UAE	Ministry of Climate Change and Environment, UAE; GGGI country office in UAE	Jordan, UAE	17	7
Africa	20-21 September	United Nations Conference Centre in Addis Ababa, Ethiopia	GGGI country office in Ethiopia	Ethiopia, Morocco, Mozambique, Senegal, Uganda, South Korea***	15	7
Latin America and the Caribbean (LAC)	4-5 October	NH Hotel, Centro Historico, Mexico City, Mexico	Ministry of Environment, Mexico; GGGI Country Office in Mexico	Chile, Colombia, Costa Rica, Guyana, Mexico, Paraguay, Peru, St. Lucia	17	3
				TOTAL	**64**	**24**

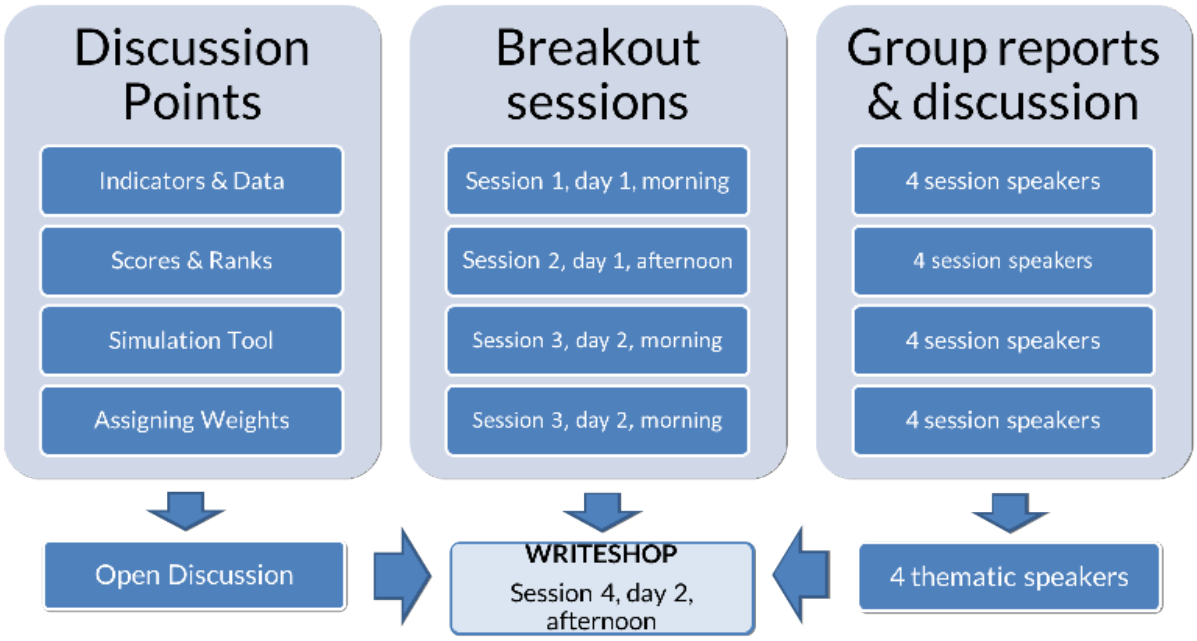
*Several experts invited from other countries were not able to attend: 3 Asia-Pacific countries, 4 MENA countries, 1 country each in Africa and LAC, and 5 GGGI Council member countries.
**These numbers exclude the GGGI country officers and partners who supported the GGGI headquarter staff in organizing the regional workshops.
*** Korea International Cooperation Agency's (KOICA) Office in Ethiopia

The presentations included details on the concept, namely, dimensions, indicators, and data, as well as methods such as outliers, normalization, aggregation, and weights, of the Green Growth Index. The workshop also featured a brief presentation and a discussion on the Simulation Tool, which links the Green Growth Index to policy scenarios. There were four main parts in each workshop (Figure 4):

- Discussion points, which were presented to experts after each presentation.
- Breakout sessions, where experts were organized into four groups to deliberate on the discussion points.
- Group reports and discussion, where each group's speaker reported on the highlights from the group's discussion.
- "Writeshop," where experts in each group wrote down details of their responses to the discussion points.

The time allocated to these parts varied across the regional workshops. In most cases, experts needed more time to discuss the indicators and the data as well as to write their group reports. The two-day workshops lasted from 9 a.m. to 5 p.m., except for the MENA regional workshop in Dubai which ended at about 2:30 p.m.

Figure 4. Structure of the regional experts' consultations



Breakout sessions

To allow for a good spread of experience, expertise, and knowledge in each group, experts from the same countries and organizations were requested to join in different groups. Whenever appropriate, gender balance was also used as a criterion for assigning experts in the groups. There were about four to six experts in each group. Participants used five flip charts to hang information sheets on the list of indicators and the characteristics of data. Each flip chart represented a dimension of green growth (Figure 5). Each group took turns on each flip chart to discuss the information and wrote down answers to discussion points on sticky notes. The GGGI staff and partners guided the discussion and provided clarification to the questions raised by the experts during the breakout sessions. For this report, the relevant discussion points during the breakout sessions include the following:

- Indicators and data:

  1. How will you rate the level of importance of the indicators and data used in each indicator: "high," "medium," "low," or "not relevant"?
  2. Please provide a brief explanation of your answer. If your answer is "low" or "not relevant," please suggest other indicators and data.

- Assigning weights:

  3. Why will you use weights? Do you think using weights for dimensions, indictors, and data is necessary? Why?
  4. Please give weights for the different indicators in each dimension and explain the criteria for the weights you have given.

Each group made presentations and submitted written reports on their responses to discussion points 1-3. For the discussion point 4, a questionnaire for Analytical Hierarchy Process (AHP) was presented to each expert during the workshop to provide their individual weights for the indicators. Due to limited time during the MENA regional workshop, the AHP survey was not conducted for each expert. The groups were requested to provide their agreed ratings for the indicators.

2.2.3. Analytical tools

Different types of information or data were collected during the workshop and various techniques of analysis were applied to generate knowledge to improve the policy relevance of the Green Growth Index framework (Table 2). The analysis of the responses to discussion point 1 is presented in section 3.1 on policy relevance, discussion point 2 in section 3.2 on level of significance, and discussion point 3 in section 4 on preferences and gaps. The techniques used for the analysis are discussed below.

Discussion point 1

Discussion point 1 aimed to get opinions and expert judgement of the participants on the relevance of indicators to policy and national or regional contexts. To allow a quantitative analysis of the group's responses to discussion point 1, the level of importance was encoded as follows: high = 5, medium = 3, low = 1, and not relevant = 0. A geometric mean was applied to the encoded data to analyze responses at the regional level as well as overall ratings on the indicators. The ratings with values from 0 to 5 were presented in gradient colors, otherwise known as a heatmap. The Excel software was used to encode, analyze data, and create the heatmap.

Table 2. Links between discussion points, data, analysis, and results

Discussion points' number and topic	Types of data	Techniques for analysis	Discussion of results
1. Ratings on relevance	Quantitative (Encoded)	Geometric mean	Section 3.1. Policy relevance
2. Assigning weights	Quantitative	AHP	Section 3.2. Level of significance
	Quantitative	AHP, correlation analysis	Section 3.3. Consistency of opinions
3. Reasons for the ratings	Qualitative	Text analyzer	Section 4. Preferences and gaps

Figure 5. Examples of workshop materials during breakout sessions

Discussion point 2

Discussion point 2 aimed to get opinions on the weights to be assigned to the indicators in each green growth dimension using the AHP. It is a participatory and multicriteria decision-making approach that indicates the relative importance of indicators based on their pairwise comparisons (Dedeke 2013, Pakkar 2014). For example, for the resource efficiency dimension, experts were asked which of these they consider more important: energy efficiency or land-use efficiency. Then, they had to give the level of importance of one indicator over the other as follows: 1 = equal importance; 2 = weak difference in importance; 3 = moderate importance; 4 = moderate plus; 5 = strong importance; 6 = strong plus; 7 = very strong importance; 8 = very, very strong importance; and 9 = extreme importance. Appendix 3 presents the structured questionnaire for the AHP. An AHP Excel Template developed by Goepel (2018) was used to analyze the responses of the experts to the questionnaire.

Additional analyses were conducted to assess the consistency of the experts' opinions on the ratings and weights. In addition to the weights, the AHP Excel template generates a consensus index that ranges from 0%, which means there was no consensus between experts, to 100%, which means there was full consensus between experts. A correlation analysis of the ratings and weights was conducted using an Excel correlation function (CORREL) to determine the consistency of the experts' ratings of and weights for the indicators.

Discussion point 3

Discussion point 3 aimed to understand the reasons for the ratings provided by the groups in discussion points 1 and 2. Descriptive analysis was used to structure the experts' responses to the questions in the different regions. In addition, specific responses that appeared most frequently across groups and regions were encoded to understand the pattern of the responses. The Excel software was used to encode responses and Voyant, a Web-based tool for text analysis and reading environment text, was used to determine the pattern of responses and compare across regions.

3 EXPERTS' OPINION ON GREEN GROWTH INDICATORS

3.1. Policy relevance

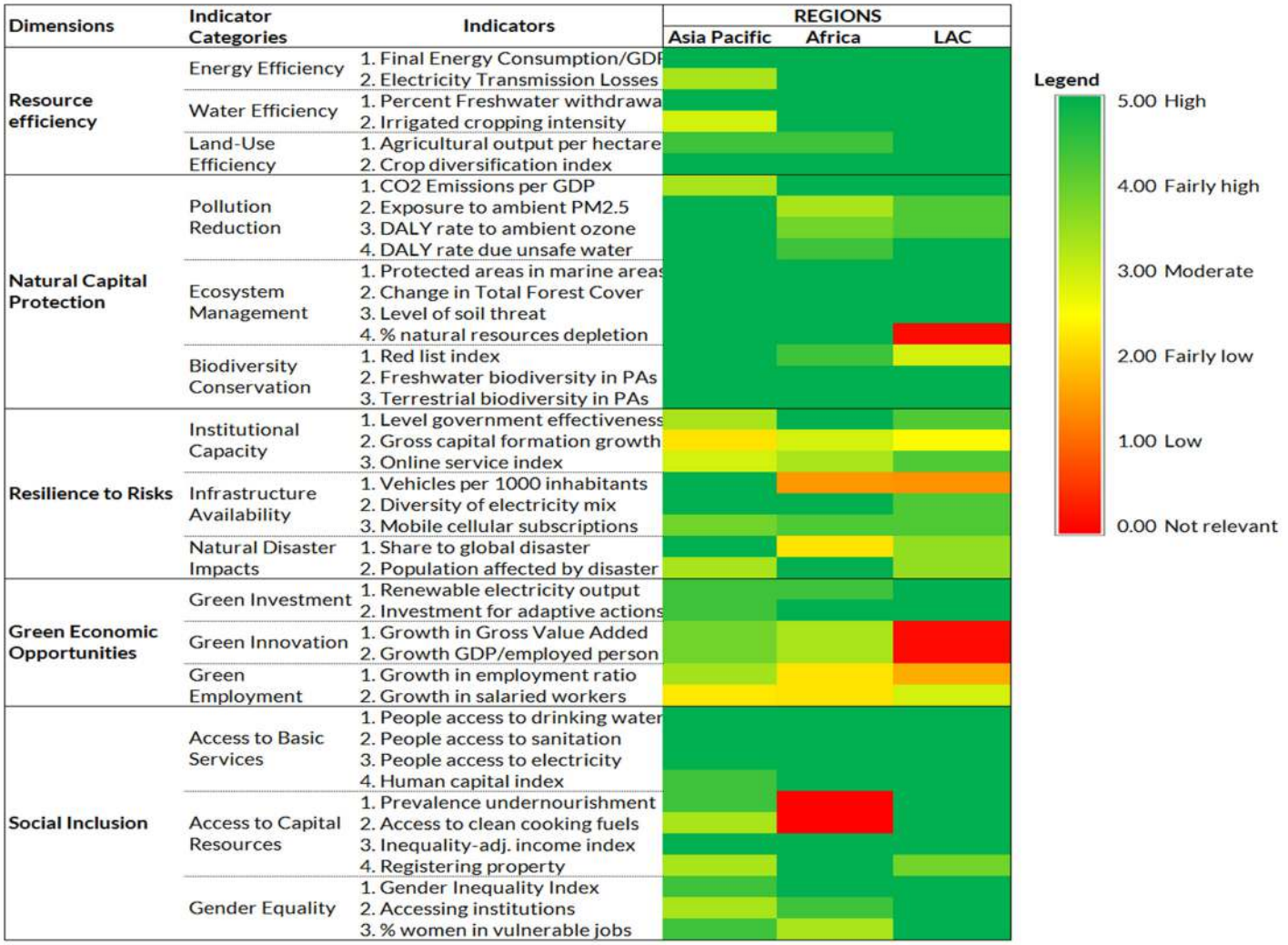
Overall, the experts rated the categories of indicators to be of "moderate" and "high" relevance to policies and contexts of their countries and regions (Figure 6). Moreover, on the average, all indicators are rated to be at least "fairly high" across regions except for MENA, which shows a slightly lower average rating. The access to basic services indicator received a "high" rating in all four regions. Other indicators that were rated "high" by experts in almost all regions were energy efficiency, pollution reduction, biodiversity conservation, and green investment. The indicators that received "fairly low" ratings in the MENA region were natural disaster impacts and green innovation. The experts from Africa and LAC rated green employment indicators as also "fairly low." Like in Africa and LAC, green employment and institutional capacity received the lowest rating in Asia-Pacific.

While, on the average, none of the indicator categories were rated "not relevant," few specific indicators received this rating in Africa and LAC regions (Figure 7). African experts rated the prevalence of undernourishment and access to clean fuels and technologies for cooking as "not relevant." Two groups rated the prevalence of undernourishment as "not relevant" for several reasons, including the correlation with other indicators in access to resources and the use of better indicators, such as occurrence of droughts, hunger gaps, and access to Climate smart agriculture (CSA) technology and agricultural inputs. The same groups provided similar suggestions for the clean fuels and technologies for cooking, that would be, the correlation with other indicators in access to resources and use of better indicators, such as the availability of technology, access to and affordability of clean cooking stoves, and the distinction between urban and rural data. In the case of the LAC region, experts rated the percentage of natural resources depletion, growth in the gross value added (GVA), and growth in the gross domestic product (GDP) per employed person as "not relevant" indicators. Although only one group rated these indicators as "not relevant," other groups rated them "low." The suggestion was to replace the first indicator with degradation and depletion costs. While the last two indicators were identified to have a relationship with growth rather than innovation, no alternative data were suggested. Further analyses on the suggestions on how to improve the indicators in the framework are discussed in section 4. The details on the availability of the indicators suggested by the experts are given in Appendix 4.

Figure 6. Policy relevance of the indicators

Note: Values for MENA were based on indicator ratings and for other regions based on data ratings.

Figure 7. Policy relevance of the data used to measure the indicators



*For indicator categories only
Note: Ratings at the indicator level were not done in MENA due to shorter duration of the workshop.

Figure 8 presents the distribution of ratings by 11 groups of experts from Asia-Pacific, Africa, and LAC on the different green growth indicators. On the other hand, the MENA experts did not provide ratings on the indicator level. A rating of 100 percent for "high" means that about 60 experts from these three regions who were in these groups all provided "high" ratings on the given indicator. All indicators received "high" ratings by more than half of the experts except for those categorized under resilience to risks and green economic opportunities. The indicators in the former green growth dimension received relatively less consistent ratings among the expert groups. For vehicles per 1,000 inhabitants, "low" ratings were due to the concerns of some groups on the data quality and the relevance of this indicator for individual country. The experts suggested to replace it with other indicators, such as mass transportation, road accessibility between regions, number of vehicles in each household, and diversity of vehicles. For the indicators on institutional capacity, the "moderate" or "low" ratings were mainly due to the lack of clarity on their definition and how they link to green growth. For the level of government effectiveness, a group suggested to consider the number of disaster risk reduction (DRR) development plans. For the online service index, suggestions were to consider other communication channels besides online services. Under natural disaster, "moderate" or "low" ratings were due to concerns about the transboundary effects of natural disasters. Some groups suggested to use indicators related to prevalence, vulnerability, and material and economic loss at the country level. With regard to the indicators for green economic opportunities, the diverse opinions were mainly due to the lack of clarity on how these indicators measure green growth and how "green" is defined.

The ratings for the indicators in the other three green growth dimensions were relatively consistent with very few exceptions. Under the dimension of resource efficiency, two groups of experts rated irrigated cropping intensity at "moderate" or "low" relevance. They suggested to include other sectors such as industry and fish farming. Agricultural output per hectare received a "moderate" rating from two groups, which suggested to focus on sustainable and efficient farming and use indicators that have more of a direct link to land use efficiency. A group that gave a "low" rating to electricity transmission loss suggested integrating this indicator with other indicators for energy efficiency. Under natural capital protection, three groups of experts rated disability-adjusted life years (DALY) rate of ambient ozone at "moderate" relevance. The experts suggested using other persistent organic pollutants to link with rapid urbanization and indicators that have a closer link to health. One group rated exposure to ambient PM2.5 to be of "low" relevance at the country level because the indicator is specific to industrialized countries. A low rating given to Red List Index was due to concerns on data quality and the relevance of this indicator to some countries. The group that gave a "low" rating to CO2 emission per GDP suggested to move it to the resource efficiency dimension and replace with SO2 emission. Under social inclusion, the reasons for the "not relevant" ratings to the two indicators for access to capital and resources were discussed above. The "low" ratings for indicators of gender equality were due to the lack of measurement for inequality among social groups and, in case of the percentage of women in vulnerable jobs, lack of clarity of definition for vulnerable jobs.

Figure 8. Overall distribution of ratings by high, moderate, low or not relevant

Note: A 100 percent "high" rating means all experts agree that the indicator has high policy relevance. The ratings were based on the opinion of 60 experts from Asia-Pacific, Africa and LAC, which were divided in 11 groups. The experts from MENA provided ratings only at the indicator category level and not for each indicator.

3.2 Levels of significance

There is an obvious divergence on opinions among the experts on how to assign weights to the indicators (Figure 9). Opinions on the weights for the indicators diverge the most among African experts. The indicators of institutional capacity in resilience to risks dimension and access to basic services in the social inclusion dimensions received weights of 50 percent and above. African experts also rated these indicators "high" in terms of policy relevance (Figure 7). Experts from other regions, however, considered institutional capacity as the second most important and assigned weights of around 30 percent. Several literatures suggested the importance of institutional capacity and access to basic services in the African contexts. Pharoah (2016) and United Nations International Strategy for Disaster Reduction (UNISDR, 2011) emphasized the importance of strengthening the capacity of government in not only delivering services to the people and reducing risk and building resilience but also in building collaboration with NGOs, United Nations (UN) agencies, and civil society groups. In Africa, the supply and quality of basic services received affect human settlements and land development. Thus, these should be adequately available. In a study by the (United Nations, 2017a), African households have the least access to services like water, sewerage, electricity, and telephone compared with those in other regions such as Asia-Pacific, Arab States, and LAC. This conforms with the relatively higher weights given to indicators for access to basic services in Africa compared to the other regions (Figure 8).

For Asia-Pacific, access to capital resources and access to basic services received almost the same weights. In this region, both access to basic services and access to capital resources are critical to poverty reduction. For a more effective delivery of services to the poor, capital resources must also be given attention (ADB, 2004). Similarly, in LAC, both indicators are critical to poverty reduction, but municipalities have limited utilities in relation to the delivery of these basic services (WB, 2002). For MENA, gender equality has fewer higher weights than access to basic services and capital resources. In MENA, there is already progress in gender equality in areas such as health and education. However, a report highlighted that one of the steps to further achieve gender equality in the region is to close the gender gaps in basic services (WB, 2013). The weights for gender equality are nonetheless lowest for Africa.

Similar to institutional capacity and access to basic services, the indicators of green investment in the green economic opportunities dimension also received higher weights among the experts in the African region (over 50%). The weights for green investment were only less than 40 percent for other regions. The UN Atlas shows that investments in renewable energy would help in establishing the economy in the African region (United Nations, 2017b). The potential of renewable energy requires increased green investments from the private sector. These investments need power purchase agreements and reliable counterparties (Hajduka 2017). Moreover, there are already programs and initiatives that promote green investment opportunities in the energy sector. These green investments aim to meet the goals of the Paris Agreement and the Sustainable Development Goals (SDGs) (AfDB, 2018).

Except for natural capital protection, weights by LAC experts for the indicators in almost all dimensions also showed a large divergence. Water efficiency in the resource efficiency dimension and infrastructure availability in the resilience to risks dimension turned out to have the highest weights in the LAC region, with at least 40 percent. Water efficiency in LAC has progressed over time. From just constructing large infrastructure for hydroelectricity generation and irrigation, LAC has progressed to providing drinking water, sanitation services, water conservation, and pollution control. Moreover, the region has recognized the significance of the water sector toward achieving economic growth and poverty reduction (Canales & Jouravlev 2012). Water efficiency received the second highest weights in other regions, except in MENA where it was given the same weights as energy efficiency.

Assigning high weights for infrastructure availability in LAC is relevant because, according to Fay and Morrison (2007), infrastructure is hampering LAC's capability to develop. Thus, the region needs to finance more infrastructure and the governments in the region should provide infrastructure service delivery. Infrastructure availability received different weights among experts in the other regions. Asia-Pacific and MENA experts gave the highest weight to this indicator although not as much as to others. African experts gave infrastructure availability the lowest weight although not much higher than natural disaster impacts. In Asia-Pacific, one of the identified commercial opportunities to strengthen resilience is to invest in and develop infrastructure (ADB, 2013). In Africa, investment in infrastructure is also a priority to increase resilience to risk (Gallego-Lopez & Essex 2016). In the MENA region, a 2013 report revealed that improved resilience to shocks and an economic focus to resource efficient industries are more prioritized than building resilient infrastructure (Dimsdale & Mabey, 2018).

For Asia-Pacific, the weights assigned by the experts to the indicators are quite varied, particularly for green economic opportunities. The experts from this region assigned weights of above 40 percent to green investment. After green investment, energy efficiency received the highest weights of about 40 percent from Asia-Pacific experts which is relatively higher than those from other regions. Energy efficiency is considered as almost equally important

Figure 9. Weights on the indicators based on experts' judgement

Note: Weights were generated from AHP, except for MENA, which were based on assigned weights for indicator categories.

as other indicators among experts from the MENA region and received lowest weights from African and LAC experts. Energy efficiency activities in the LAC region have been limited. These are only given priority as a response to energy supply deficit and crises (Copenhagen Centre on Energy Efficiency, 2015). In Africa, inadequate access to energy services is a main challenge for development. Energy-efficient technologies and renewable energy do not draw investment and policy commitment (United Nations Industrial Development Organization [UNIDO], 2009b, 2009a).

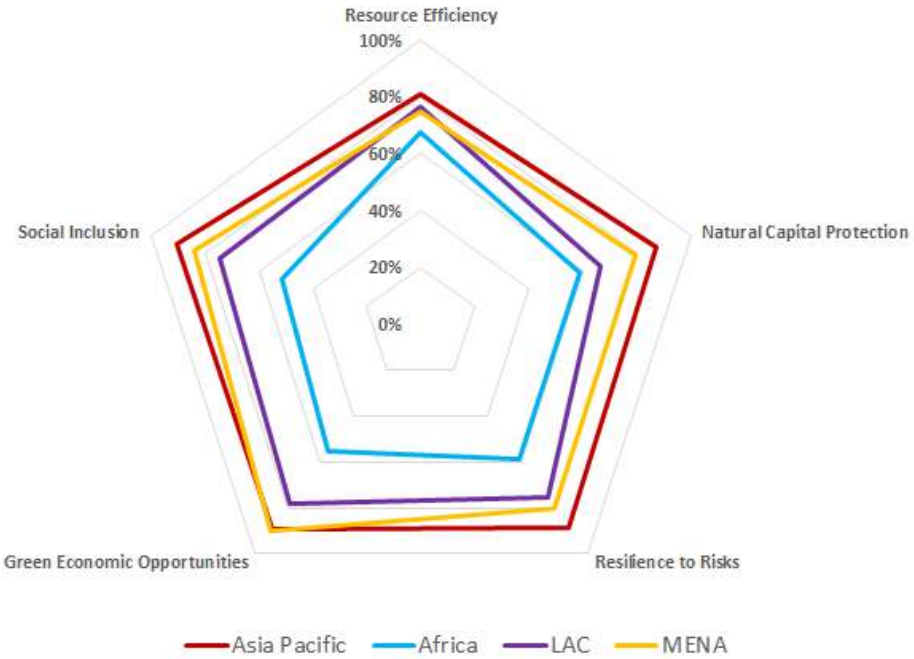
Pollution reduction received a weight of only 32 percent from Asia-Pacific experts, slightly lower than those given by experts from LAC and significantly lower than those from MENA. While pollution reduction is considered as important as other indicators of natural capital protection in LAC, it garnered the highest weight at 40 percent from MENA experts and lowest weight at only 20 percent from African experts. Factors such as industrialization, local climate, economic development, and consumer behavior affect pollution rates. In the case of waste generation, a report by Hoornweg & Bhada-Tata (2012) reveals that the annual waste generation in East Asia and the Pacific is highest at around 270 million tons per year. In comparison, annual waste generation in Eastern and Central Asia amount to 93 million tons, in LAC around 160 million tons, and in Africa and MENA 62 million tons each.

3.3 Consistency of opinions

Figure 10 presents the level of consensus among the experts on the weights assigned to the indicators based on AHP. The consensus values range from zero to 100 percent, where the latter implies a unanimous opinion on the weights. The consensus was highest among the experts from Asia-Pacific, followed by those from MENA. Asia-Pacific experts had at least 80 percent consensus for their weights, with the lowest agreement on weights assigned to resource efficiency. The consensus was lowest among experts from Africa. The highest consensus was for resource efficiency at only 68 percent and the lowest for social inclusion at only 51 percent. The very low consensus on social inclusion is not surprising because the region has one of the most complex social issues to address. Africa has half of the world's extremely impoverished people. Poverty reduction in the region also falls behind other regions. Thus, urgent actions to end global poverty are needed in the region and social inclusion plays an important role in this. Some of the data on social inclusion in the region show that the youth in the region grow fast. Opportunities include the demographic dividend, while risks include violence and radicalization. Moreover, women's opportunities in the region are limited because of insecurity and violence. Another challenge is forced displacement due to natural disasters, governance failures, conflict, human rights abuse, and persecution (WB, 2017).

The levels of consensus among the experts in LAC were around 75 percent in all dimensions, except for the natural capital protection which was only 67 percent. The large divergence in consensus not only across regions but also on the dimensions of green growth will have an implication on assigning weights to the indicators. A higher level of consensus would be needed to identify the appropriate weights for the indicators. One of the breakout session groups in MENA would prefer to assign equal weights to the indicators in all five dimensions of green growth.

Figure 10. Experts' level of consensus on the weights, by region



Note: Due to lack of time during the regional consultation workshop, no survey on the AHP was conducted in MENA. Survey per e-mail was sent to MENA experts to identify their level of consensus.

4 PREFERENCES AND GAPS

From an analytical point of view, the experts provided insights and inputs that presented the opportunity to further refine all components of the Green Growth Index. In general, they expressed the need for clarification and further explanation of the indicators and the associated data sources to ensure their relevance not only at the global but also at the national and subnational levels. Accordingly, across regions and different dimensions of the Green Growth Index, the experts articulated their concern over the need for quality data sources that are representative of the issues in the different regions. Water and land use efficiency indicators and data sources are the common thematic areas that the experts think are important yet more appropriate definitions and data are necessary.

At the regional level, the preferences of the experts are correlated with the data that they think should be included in the Green Growth Index. Further, there is a qualitatively observable correlation between the responses of the experts to the availability of the resources at the regional level. In Asia-Pacific, for instance, the experts favor indicators related to resource efficiency, natural capital protection, and green economic opportunities. This is consistent with what (Rankine et al., 2017: p.15) reported that in Asia-Pacific, "[t]errestrial ecosystem protection shortcomings are impacting rural livelihoods, food security and biodiversity in some of the most vulnerable areas of the region [including] rural areas, coastal communities, and small island developing States. Water is [...] the most fundamental resource and is under pressure across the region. Per capita water resources are declining, and some 80–90 per cent of wastewater is discharged without treatment in the region's developing countries. Between 1990 and 2010, per capita water availability dropped by more than one third in some countries [...]." The current state of the environment and economic landscape in the region perhaps contributed to the inclination of the regional experts toward those indicators.

In the MENA region, the experts focused their preference on understanding the bigger picture and relevance of the indicators and data sources to the represented states. They understand that the region may need to invest its efforts in more relatable data, such as those related to innovation, employment, and water and energy efficiency, that are contextualized to the uniqueness of the region. Clearly, the MENA experts identified resource efficiency as the thematic area where there are indicator and data source gaps. The sections below further elaborate on each of the preferences and gaps for each of the indicator grouping.

The foci on data on land-related and country-level indicators are at the center of the preferential and gap discussions in Africa. This is not surprising as Lopes (2014) reported that about 75 percent of Africans rely on land for agricultural production. Agriculture accounts for almost one-third of Africa's GDP. As such, these figures explain the regional focus on land-related indicators.

In the LAC region, the preferences that the experts described are correlated with the resources in the region. For example, considering the coastal and watershed areas in the region, the experts showed interest toward resource efficiency and natural capital indicators. The experts also considered the indicators related to resilience to risks as important to them. Although there is regional inclination toward these thematic areas, the experts believed that there are data sources that may have not been considered for the region. Better integration of social data, such as gender and population, into other groupings of indicators, such as natural capital protection and green economic opportunities, is an example of the gap identified for the region.

To better understand the experts' thematic preferences and perceived gaps, the sections below explain in detail the viewpoints related to resource efficiency, natural capital protection, resilience to risks, green economic opportunities, and social inclusion

4.1. Resource use efficiency

The majority of the experts recognized the importance The majority of the experts recognized the importance of energy, water, and land use efficiency in support of green growth development. The discussion, however, revealed that the national data to support the resource efficiency indicators need revisiting. For example, in Middle Eastern countries such as the UAE, freshwater resources are fairly limited and the experts expressed that using freshwater data as a measure of the indicator may not show the real picture. In the UAE, groundwater is the only source of natural freshwater. Due to the lack of rainfall and elevated levels of evaporation, the rate of recharge is insignificant compared to the rate of abstraction from shallow groundwater aquifer systems (Al Blooshi, 2017). Accordingly, experts identified losses from water distribution networks as an important measure to assess water efficiency as, by doing so, it broadens the sector beyond agriculture. Data availability across all four regions is the challenge for this measure. Since water consumption rates are often readily available, data at the national level on water distribution network losses, quantity of treated seawater for desalination, and transboundary water flows may be significantly lacking for many countries. This represents an important data gap for some of the experts.

In terms of energy efficiency, experts suggested complementing the current measure with energy consumption per capital. In addition to energy intensity, experts explained that monitoring energy production and the energy source or carrier through data on energy supply and share of renewable energy reflect green growth principles better than assessing energy efficiency only from energy consumption. The gap on measuring renewable energy share shows there are still possible data to consider to improve the Green Growth Index.

In addition to monitoring land use for agriculture, data on urban land use can also be a measure to show land use efficiency. This suggestion is consistent with what (Zitti, Ferrara, Perini, Carlucci, & Salvati, 2015: p.3360) proposed in their study. According to the researchers, urban land use efficiency indicates how "[u]rbanization stimulates land use changes, determining the contraction of agricultural land, the consolidation of forests and other natural land and the expansion of urban land."

Further, the discussions showed that material efficiency is an important category which could provide relevant information on resource efficiency. Given that material efficiency refers to the "the pursuit of technical strategies, business models, consumer preferences, and policy instruments that would lead to a substantial reduction in the production of new materials required to deliver well-being," the material efficiency measure, to some extent, includes water and energy efficiency (Worrell, Allwood, & Gutowski, 2016: p.575). This, accordingly, may fill some of the gaps identified for water and energy efficiency measures.

4.2. Natural capital protection

The regional experts, in general, acknowledged that ecosystem management and biodiversity conservation are relevant indicators for natural capital protection. The measures supporting these indicators, however, need some review because data sources overlap and may induce a misestimation of the natural capital protection dimension. For example, by restricting the protected area measure to marine areas, the Global Green Growth Index will be missing out on other important components, such as those related to terrestrial or freshwater protected areas. This, according to the experts, is a gap that needs to be addressed by expanding the protected area measure to other ecosystems. Experts recommended a broad measure for protected areas, which can either be marine or terrestrial.

The experts from different regions expressed concerns on the quality and methodology of the data related to the soil measure, despite having high reported relevance. While the soil threat index may be a viable measure, it only assesses the "level of risk on which the soil is exposed to degradation threats" and does not show the "ability of soil to perform ecosystem and social services", and respond to a "gradient of a stress or disturbance," which the soil quality index and the soil sustainability index measure, respectively (Tóth, 2008: p.10). As such, the experts proposed to address this gap.

In support of pollution reduction, particularly air pollution, the regional experts agreed that CO2 is generally not considered as a pollutant and it should not be used as a measure. CO2 intensity, however, may be more relevant in the resource efficiency dimension. Other experts also raised the issue that neither PM2.5 nor ambient ozone is the emission of highest concern relating to air pollution across the different regions. As such, the air pollution measure should consider other pollutants such as volatile organic compounds (VOCs) or sulfur dioxide (SO2). These preferences in terms of appropriate measure for air pollution are consistent with what many countries consider as "criteria air pollutants," which include air pollutants that have been regulated and are used to measure air pollution in many countries (Wang, Ying, Hu, & Zhang, 2014). Carbon monoxide, lead, nitrogen dioxide, ozone, and sulfur dioxide are some of the "criteria air pollutants" considered at the global scale. The experts suggested that a similar review of the water pollution measures is necessary, highlighting the need for more recognized and systematic measures of pollution, including relating to hazardous materials. Finally, the experts would like a better understanding of

the natural resource depletion measure. In addition to clarity in definition, the regional experts perceived that the adjusted savings from natural resource depletion may be a better indicator to the resource efficiency dimension. Those from the LAC region suggested including measures on the costs of degradation or depletion as well as the expenditure or budget dedicated to ecosystem protection and management.

4.3. Resilience to risks

Governments play critical roles in ensuring that communities at various levels of governance are resilient to several types of risks. Although the regional experts agreed on the significant role of governments in building resilience, they argued that the institutional capacity measure of government effectiveness is very limited. The regional experts showed interest in monitoring the institutional capacity of multiple stakeholders, including the capacity and participation of civil society organizations and the private sector in decision-making. This is part of what (van der Vegt, Essens, Wahlström, & George, 2015: p.976) refer to as "[t]ri-sector collaboration [which] is the coming together of public and private sectors with civil society to jointly address issues of relevance to society." As the researchers noted, "[t]he value of multi-stakeholder collaboration [to address resilience] has long been recognized."

To further close the stakeholder inclusivity gap under the institutional capacity dimension, the experts identified additional governance-related indicators, such as rule of law, control of corruption, and human rights measures. Gross capital formation may be a better measure for infrastructure availability or green investment, according to the regional stakeholders. Furthermore, the experts commented on the applicability of the online service index to measure public services because there is a wide disparity in terms of access to the Internet in developed and developing countries. The regional experts expressed the need to provide additional clarification of this measure because it does not clearly reflect institutional capacity, in general, or resilience, specifically.

The experts across all regions noted that the proportion of vehicles to the population as a measure of resilience, in terms of having an available transport mode at the event of a need for evacuation, is problematic for two specific reasons. First, according to the stakeholders, this measure imposes a bias toward developed countries, where cars a more widely used. Second, having more cars may translate to higher greenhouse gas emissions, which may contradict the principles of green growth and building resilience. To address these concerns, the regional experts suggested replacing the indicator with data on road infrastructure quality. Alternatively, the regional stakeholders also suggested measuring the quantity or diversity of emergency response facilities and vehicles.

Similarly, the experts articulated the need to clarify how monitoring electricity diversity supports resilience to risks. They further expressed that the measure might be more appropriate under the resource efficiency dimension. The experts in the different regions proposed that data on other forms of communication channels, such as the Internet and cellular phones, could be monitored to better assess infrastructure availability.

In terms of natural disaster impacts, all regional experts agreed to include the data on economic damage and losses from natural disasters. The regional experts, however, suggested excluding the measure related to the share of global disasters, as only the impacts of and vulnerability to disasters are actionable, not the occurrence of natural hazards, which depend on exposure. The experts also highlighted the importance of reporting on the implementation of disaster risk reduction plans and multi-hazard early warning systems.

4.4. Green economic opportunities

The regional experts had a progressive stance and expressed their preference that the green economic opportunities dimension include green or sustainable measures rather than measure based on general economic data that do not necessarily depict green growth performance. The experts acknowledged that green investments, green innovation, and green employment are good measures. However, the reliability of quality and comparable data may be an issue across different regions. Accordingly, the regional experts believed that this represents an important gap in measurement.

The experts argued that measuring green investments through renewable energy output is limiting since there are other areas that mitigation investment is also pertinent, such as green bonds or investments in green public transport. Further, framing green investments through climate mitigation and adaptation lens is very restricting especially when green investments can take various forms (Voica, Panait, & Radulescu, 2015). As such, the regional stakeholders suggested revisiting the measures and definition as well as identifyng data that can show growth in green investments at the most relevant levels of governance.

As noted by Schiederig, Tietze, & Herstatt (2011) in a quantitative literature review, green innovation experts highlighted that green innovation does not necessarily refer to goods or services that reduce environmental burden

but rather aims to increase environmental benefits. This provides context to the feedback from the regional experts that GVA and real GDP growth per employed person may not be properly assessing green innovation. Accordingly, to measure green technological innovation, the stakeholders mentioned that the number of green patents, copyrights, and trademarks may serve as proxy to green intellectual property rights, which the experts perceived as a better yardstick for real green innovation.

According to the majority of the regional experts, measures in support of green employment should, similar to green investment and green innovation, directly monitor green decent jobs, rather than account for growth employment figures in general. The experts highlighted the need for a clearer definition of green employment to measure it appropriately. The current suggested indicators for green employment are more suited to measure social inclusion, according to the experts.

4.5. Social inclusion

Across all regions, the experts noted that access to basic services and capital resources as well as gender equality are good but not sufficient indicators of social inclusion. To better measure gender equality or assess gender gaps, for instance, the regional experts believe that the data for the different dimensions of the Green Growth Index can be gender-disaggregated if data sources permit. This, according to the experts, is an important gap specifically for indicators under the green economic opportunities dimension such as decent green employment.

According to many experts, while access to basic services, such as water, electricity, and education, are important measures, including access to affordable and nutritious food as well as access to basic healthcare services will add value to the indicator. Data such as life expectancy or child mortality would be an important indicator for access to basic health care services. The suggestion to include access to affordable and nutritious food as well as access to basic health care services is consistent with Article 25 of the Universal Declaration of Human Rights, which states that "[e]veryone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services" (United Nations, 1948: p.7).

Regarding access to basic education, the experts expressed their interest in breaking down the indicator on education to monitor its different components, such as literacy rates as well as the presence of green education programs. Concerning access to electricity, the experts noted the importance of reporting on access to sustainable and renewable energy. In considering access to sustainable and renewable energy, the regional experts cautioned against double counting because there are other dimensions of the Green Growth Index that assess renewable energy, including access to clean fuels, which can possibly cover only those related to cooking. The experts also suggested adding a measure on access to financial services for monitoring access to capital. Further, the measure related to property registration, according to the regional stakeholders, may not be an appropriate measure because access to property depends on each country's land ownership policy. Others also noted the specific importance of monitoring indigenous communities' and women's property rights.

To further enhance the social inclusion dimension, the regional stakeholders recommended reporting the results in a disaggregated manner not only by gender but also by age and level of education. The experts also favored monitoring social inclusion of different social groups within a population, such as indigenous people or people with disabilities. Some experts also suggested including data on community awareness and participation in public policy in this dimension.

5 CONCLUSIONS

The assessment of the experts' feedback from the regional workshops reveals the need to further improve the indicators for the Green Growth Index, particularly those for resilience to risks and green economic opportunities. Many of the experts' ratings on the indicators in terms of policy relevance are "low" and "not relevant" mainly due to lack of direct relationships to green growth. The indicators do not directly measure green growth and can result in bias toward other countries when using proxy variables. In the case of green economic opportunities, the lack of definition for and distinction in "green" activities and outputs in economic activities cause uncertainty in the relevance of the indicators, such as for green employment and innovation. Using patents on green technology is one useful suggestion from the experts. There are currently no available indicators to directly measure green employment, although there are ongoing efforts to define an indicator and collect data. Because green employment is an important indicator for green growth, the best available proxy variable will be used for now and replaced with better data as they become available in the future.

In the case of resilience to risks, the experts' suggestions on the indicators are more challenging to address due to lack of data (Appendix 4). For the institutional capacity indicator, there are no available data on monitoring the institutional capacity of multiple stakeholders, including the capacity and participation of civil society organizations and the private sector in decision-making. Moreover, considering multiple stakeholders' capacity would refer to the concept of governance, which by itself has a multi-dimensional and multi-sectoral coverage, that will be difficult to integrate into or go beyond the concept of green growth. For the availability of infrastructure indicator, while the comments on the lack of direct relationships to green growth are valid, there are currently no data available at the country-level to measure resilient infrastructure, or even resilience of cities where a large share of infrastructure is built.

In view of the above, major improvements on the framework should focus on resilience to risks and green economic opportunities. The opinions of the experts on the indicators for resource efficiency, natural capital protection, and social inclusion are generally positive with very few exceptions. The three main reasons for the "low" ratings for few indicators in these dimensions are as follows:

a. Diverse institutional, economic, and environmental conditions. The relevance of the indicators depends on countries' institutional, economic, and environmental conditions. Because these conditions are diverse across the regions, indicators that are very important for some countries are irrelevant for others. Examples are freshwater resources that are limited in supply in the Arab states; marine areas, which do not exist for landlocked countries; PM2.5, which is not a concern in countries with small industry and transport; and online services, whose accessibility is limited by the Internet infrastructure. While these concerns are valid, excluding these indicators to compare green growth performance across countries will not be an appropriate solution. The framework of the Green Growth Index should be able to represent the multi-dimensionality of green growth to allow for a comparative assessment across countries and regions. The countries' performance is measured according to decisions and actions they do and not on the availability of their resources.

   In case of resources with limited supply, such as freshwater, the indicator on water stress, which is freshwater withdrawal as ratio of available freshwater resources, is a measure of efficiency because it gauges how countries use their resources relative to their availability. While landlocked countries with no marine areas will not have marine areas, their performance on protecting resources will

be only represented by land areas; marine areas thus are not a relevant indicator. Because performance is measured on the use of natural resources that are available in a country, it is not meant to penalize any country that do not have these resources by nature, a value of zero is not assigned but only left blank. The use of indicators that depend on the availability of infrastructure — for instance, PM2.5 pollution from industry and transport, access to online services as influenced by internet availability — assumes that the countries' performance is measured by addressing the challenges. This means that if PM2.5 is high, a country should reduce it through appropriate policies; or if online services are low, it should increase investment in internet infrastructure.

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b. Lack of sectoral coverage and thematic dimensions. Some experts commented on using mainly indicators related to agricultural crops for land use efficiency. But there are important reasons for this: About 40 percent of the global land area is used for agricultural land, including arable, under permanent crops; under permanent pastures (about 30 percent is forest land, (WB, 2019), more than 40 percent of the global food from agriculture is produced in degrading drylands (ELD Initiative, 2015); marginal lands are increasingly used for agricultural production (Gibbs & Salmon, 2015); and technologies and agricultural practices are

available to reduce degradation. Material efficiency has not been sufficiently covered in the framework. This comment can be addressed by using data on domestic material consumption and material footprint as indicators for material use efficiency. Social inclusion in the framework measures equality only for gender and not for other parts of the society. The indicators will be expanded to cover other social issues, such as urban-rural equality. However, other suggestions, such as equality for indigenous communities, are more difficult to consider due to the lack of data.

c. Concerns on the quality of data and methodology. There are specific and general concerns on the quality of data and methodology to generate them. Specific concerns on the quality of data refer to the Red List Index because of the limited coverage of species and the methodology to soil threat because of the limited measure of soil quality and sustainability. These data gaps can be addressed in the short run by either adding indicators or replacing with another indicator. It is expected, however, that in the long run not only availability but also quality of data will improve as many organizations are currently working on SDG indicators, with many of them being relevant for green growth. General concerns refer to the acceptance or recognition of the data produced and published by international organizations. While some experts would prefer to use data from national statistical agencies, using data from international organizations offers important advantages for measuring performance across countries. For example, collecting data from national agencies for more than 100 countries will be cumbersome, while data from international organizations are collected from national agencies and have undergone consistency checks. Making the data and sources of data for the indicators transparent and available to experts and users will be useful in addressing the concerns on the quality of data.

Other suggestions are more straightforward and can be easily addressed to improve the framework. Overlaps in the indicators of ecosystem management and biodiversity conservation can be addressed by combining them into one indicator category. Indicators with contradicting impacts on green growth, such as the number of vehicles, and which is not under human control, such as the number of natural disasters, will be removed and replaced by another indicator. Finally, indicators that received “low” ratings due to the lack of clarity on the definition will be addressed by providing sufficient information on the data, sources, and methodologies.

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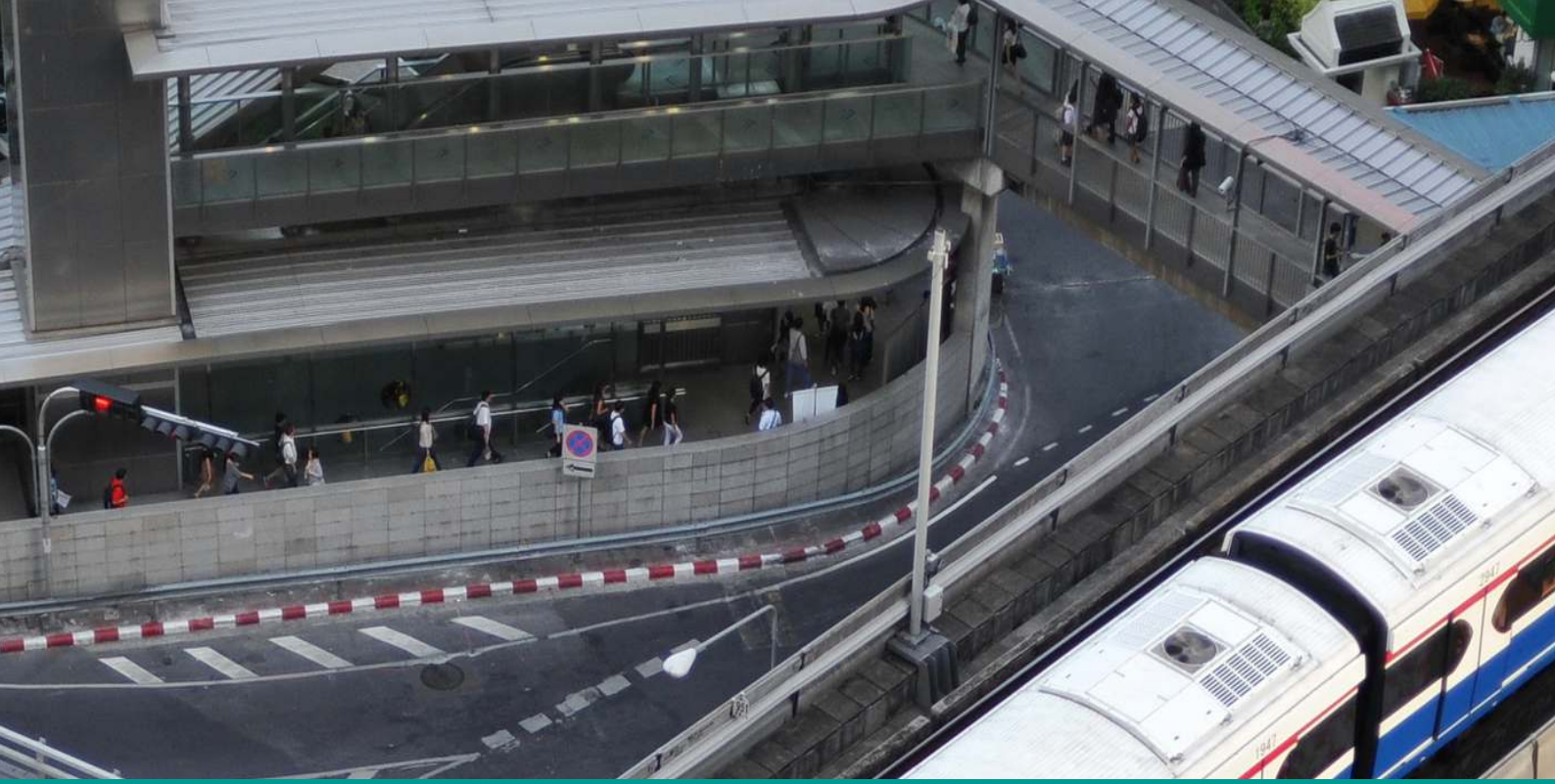
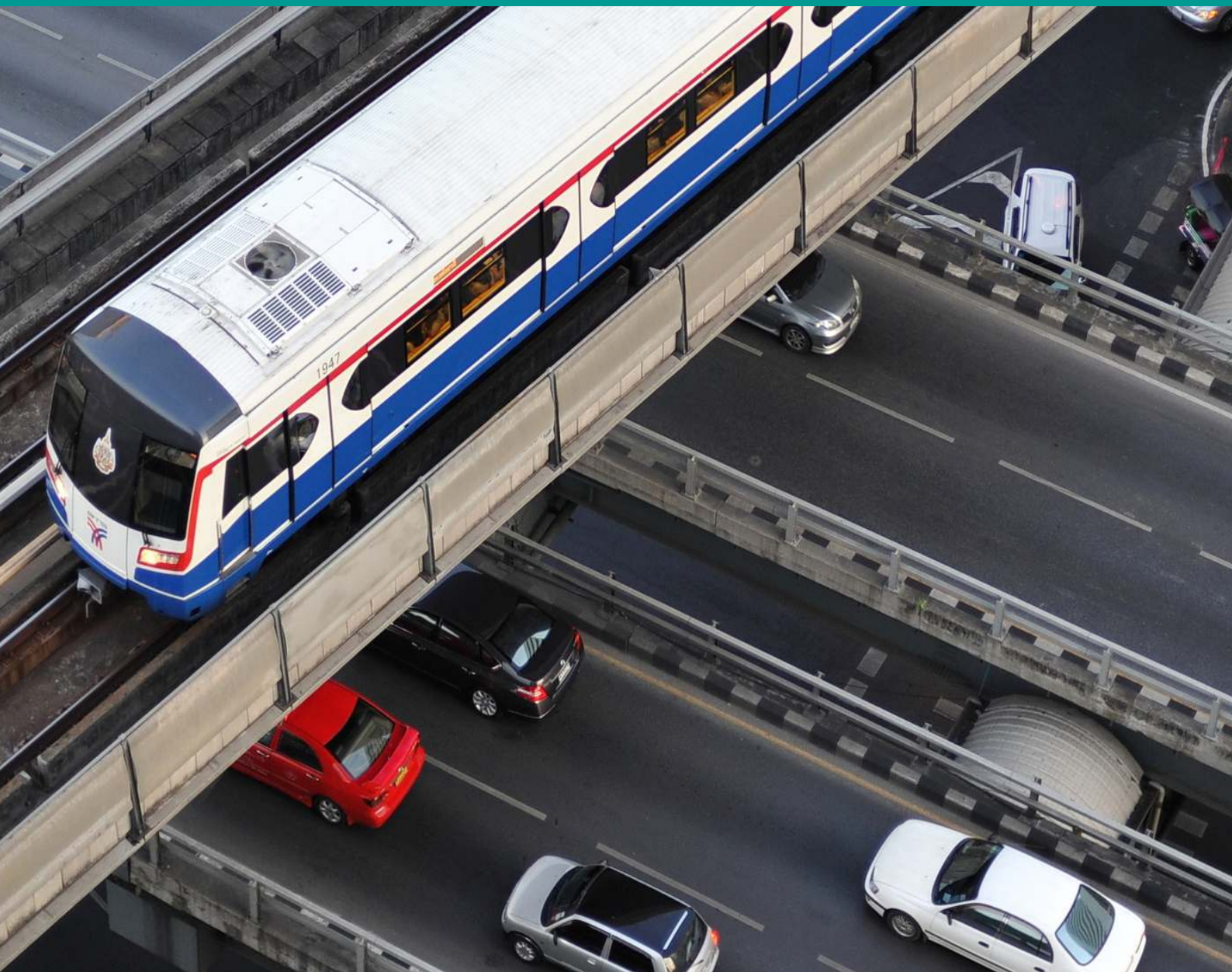


APPENDICES

Assessment of Feedback From Regional Expert Consultations on The Green Growth Index (Phase 2)



Appendix 1. Description of data for the Green Growth Index

Description	Data	Definition [data source] [3]	Links to green growth and SDGs
1st dimension: Energy efficiency			
Energy intensity	Total final energy consumption/ GDP	Total final consumption (TFC) is the sum of the consumption in the end-use sectors and for non-energy use. Energy used for transformation processes and for own use of the energy-producing industries is excluded. The final consumption reflects, for the most part, deliveries to consumers. Backflows from the petrochemical industry are not included in the final consumption. Note that international aviation bunkers and international marine bunkers are not included in the final consumption except for the world total, where they are reported as world aviation bunkers and world marine bunkers in transport. [International Energy Agency]	Less use of energy in producing goods and services contributes to the efficient use of available natural resources. Data have a negative relationship with green growth. Links to SDG 7, on affordable and clean Energy; SDG 12, on sustainable consumption and production; SDG 13, on climate action.
Power generation efficiency	Transmission and distribution losses of electricity (% of output)	Transmission and distribution losses comprise all losses due to the transport and distribution of electrical energy, including losses in overhead transmission lines and distribution networks, as well as losses in transformers that are not considered as integral parts of the power plants. Non-technical losses mainly refer to electricity theft. Low levels of electricity losses mean that a country's electricity distribution system is efficient, which supports economic growth. [International Energy Agency]	Losses are wasted resources and not used in producing goods and services. Data have a negative relationship with green growth. Links to SDG 7, on affordable and clean energy; SDG 12, on sustainable consumption and production; SDG 13, on climate action.
1st dimension: Water efficiency			
Water intensity	Freshwater withdrawal as a proportion of available freshwater resources	The level of water stress: freshwater withdrawal as a proportion of available freshwater resources is the ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after taking into account environmental water requirements. SDG target addressed: By 2030, substantially increase water use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity. [Food and Agriculture Organization]	Use of water resources, particularly if supply is limited, needs to be reduced to avoid environmental stress. Data have a negative relationship with green growth. Links to SDG 6, on clean water and sanitation; SDG 12, on sustainable consumption and production.
Water efficiency	Irrigated cropping intensity (%)	The fraction of the cultivated area that is harvested. Cropping intensity may exceed 100 percent where more than one crop cycle is permitted each year on the same area. In AQUASTAT, cropping intensity has been calculated on irrigated crops only and becomes practically the ratio of the harvested irrigated areas over the area equipped for full control irrigation actually irrigated. Irrigation, by decoupling the crop production from the natural precipitation, increases cropping intensity in countries where temperatures are not a limiting factor. [Food and Agriculture Organization]	Agriculture is the largest consumer of water resources. Increased cropping intensity or more harvest seasons per year implies that more water is consumed for agriculture. Data have a negative relationship with green growth. Links to SDG 2, on zero hunger; SDG 6, on clean water and sanitation; SDG 12, on sustainable consumption and production.
1st dimension: land efficiency			
Agricultural land productivity	Agricultural output (tons)/ hectare	Agricultural land refers to the share of the land area that is arable, under permanent crops, and under permanent pastures. Arable land includes land defined by the Food and Agriculture Organization as land under temporary crops, that is, double-cropped areas are counted once; temporary meadows for mowing or for pasture; land under market or kitchen gardens; and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded. Land under permanent crops is land cultivated with crops that occupy the land for long periods of time and need not be replanted after each harvest, such as cocoa, coffee, and rubber. This category includes land under flowering shrubs, fruit trees, nut trees, and vines, but excludes land under trees grown for wood or timber. Permanent pasture is land used for five or more years for forage, including natural and cultivated crops. Source: Food and Agriculture Organization.	Higher yield represents efficient use of land resources, that is, more produce for less land. Data have a positive relationship with green growth. Links to SDG 2, on zero hunger; SDG 12, on sustainable consumption and production.
Agricultural land productivity	Crop diversification index (Herfindahl)	Crop diversification refers to the raising of varieties of crops in a given area in a crop season. To achieve agricultural sustainability, there must be crop diversification (Dali and Mili 2010) or Herfindahl (higher value less mix, lower value higher mix). [Food and Agriculture Organization]	More crops in a given unit of land allow the efficient use of land resources and improve crop (bio) diversity. Data have a positive relationship with green growth. Links to SDG 2, on zero hunger; SDG 12, on sustainable consumption and production.

[3]Unless other references are cited, the information is drawn from data sources.

2nd dimension: emission and pollution reduction			
Greenhouse gas emissions	CO2/GDP	International Energy Agency data include CO2 emissions from (fossil) fuel combustion. The IEA data provide sectoral breakdown — such as transport, industry, and commercial/residential — which is currently used in the subsectors in the matrix. [International Energy Agency]	Carbon emissions contribute to global warming. Less emission for every unit of production of goods and services reduces air pollution. Data has a negative relationship with green growth. Links to SDG 7, on affordable and clean energy; SDG 12, on sustainable consumption and production; SDG 13, on climate action
Air pollution	PM2.5 exposure	Population-weighted exposure to ambient PM2.5 pollution is defined as the average level of exposure of a nation's population to concentrations of suspended particles measuring less than 2.5 microns in aerodynamic diameter which are capable of penetrating deep into the respiratory tract and causing severe health damage. Exposure is calculated by weighting mean annual concentrations of PM2.5 by population in both urban and rural areas. [Downloaded from the World Bank; Brauer, M. et al. 2016, for the Global Burden of Disease Study 2016]	Particulate matter emissions are harmful to health. Data have a negative relationship to green growth. Links to SDG 3, on health and wellbeing; SDG 11, on sustainable cities and communities.
Air pollution	Ambient ozone	Age-standardized disability-adjusted life years lost per 100,000 persons, or the DALY rate due to ambient ozone. Age standardization is a statistical technique used to compare populations with different age structures in which the characteristics of the populations are statistically transformed to match those of a reference population. It is useful because relative over- or under-representation of different age groups can obscure comparisons of age-dependent diseases, for instance, ischemic heart disease or malaria, across populations. [Institute for Health Metrics and Evaluation]	Ground level ozone was an issue near busy roads. It is formed from NOx and VOCs in the presence of sunlight. Data have a negative relationship with green growth. Links to SDG 3, on health and well-being; SDG 11, on sustainable cities and communities; SDG 13, on climate action.
Water quality	Unsafe water sources	Age-standardized disability-adjusted life years lost per 100,000 persons, or the DALY rate due to unsafe water sources. [Institute for Health Metrics and Evaluation]	Water pollution is harmful to the human health and the environment. Data have negative relationship with green growth. Links to SDG 3, on health and well-being; SDG 6, on clean water and sanitation; SDG 11, on sustainable cities and communities.
2nd dimension: Ecosystem management			
Marine protection	Coverage of protected areas in relation to marine areas	The percentage of marine waters in a natural or cultural heritage marine protected area. This indicator is expressed as percentage of protected total surface area of national waters. The marine area indicator can be expressed by different zones under national jurisdiction, for instance, territorial waters or exclusive economic zones. SDG target addressed: By 2020, conserve at least 10 percent of coastal and marine areas, consistent with national and international law and based on the best available scientific information. [UNEP World Conservation Monitoring Centre (UNEP-WCMC) and the IUCN World Commission on Protected Areas (WCPA)]	A protected area is an important form of ecosystem management and helps protect the environment. Data have positive relationship with green growth. Links to SDG 2, on zero hunger; SDG 14, on life below water.
Forest protection	% change in total forest cover	Ratio of forest cover over land area values. The percentage change is the calculated five-year change of the ratio. Forest area is land under natural or planted stands of trees of at least five meters in situ, whether productive or not, and excludes tree stands in agricultural production systems — for example, in fruit plantations and agroforestry systems — and trees in urban parks and gardens. [Food and Agriculture Organization]	Forests are important sources of carbon emission mitigation as they absorb carbon from the atmosphere. Data have a positive relationship with green growth. Links to SDG 13, on climate action; SDG 15, on life on land.
Land protection	Soil threat	This map is presented on pages 134-135 of the Global Soil Biodiversity Atlas. The map shows the potential rather than the actual level of threat to soil organisms. For the development of this map, the following threats and corresponding proxies were chosen: loss of aboveground biodiversity, agricultural use, overgrazing, fire risk, soil erosion, land degradation, and climate change. [European Commission Joint Research Center]	Soil biodiversity is lost due to human activities. Biodiversity loss reduces the productivity of the soil. Data have a negative relationship with green growth. Links to SDG 2, on zero hunger; SDG 13, on climate action; SDG 15, on life on land.

Land minerals protection	Adjusted savings: natural resources depletion (% of GNI)	Natural resource depletion is the sum of net forest depletion, energy depletion, and mineral depletion. Net forest depletion is unit resource rents multiplied by the excess of roundwood harvest over natural growth. Energy depletion is the ratio of the value of the stock of energy resources over the remaining reserve lifetime, which is capped at 25 years. It covers coal, crude oil, and natural gas. Mineral depletion is the ratio of the value of the stock of mineral resources over the remaining reserve lifetime, which is capped at 25 years. It covers tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate. [World Bank staff estimates based on sources and methods described in "The Changing Wealth of Nations 2018: Building a Sustainable Future" by Lange et al. 2018]	Resource depletion will not sustain economic growth. Data have a negative relationship with green growth. Links to SDG 13, on climate action; SDG 15, on life on land.
2nd dimension: Biodiversity conservation			
Species diversity (endangered species)	Red List Index	The RLI uses data from the IUCN Red List of Threatened Species. The IUCN Red List uses quantitative criteria based on population size, rate of decline, and area of distribution to assign species to one of seven categories of relative extinction risk, ranging from "extinct" to "least concern" (or to a "data deficient" category for species that are very poorly known). An RLI value of 1.0 equates to all species being categorized as "least concern," and hence none are expected to go extinct in the near future. An RLI value of zero indicates that all species have gone extinct. [International Union for Conservation of Nature]	Biodiversity sustains economic growth and environmental sustainability. Data have a positive relationship with green growth. Links to SDG 2, on zero hunger; SDG 14, on life below Water; SDG 15, on life on land.
Freshwater biodiversity	Proportion of important sites for freshwater biodiversity which are covered by protected areas	The proportion of important sites for freshwater biodiversity that are covered by protected areas, by ecosystem type. SDG target addressed: By 2020, ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements. [United Nations Statistics Division/UNEP-WCMC and IUCN 2018]	Biodiversity sustains economic growth and environmental sustainability. Data have a positive relationship with green growth. Links to SDG 2, on zero hunger; SDG 6, on clean water and sanitation; SDG 14, on life below water; SDG 15, on life on land.
Terrestrial biodiversity	Proportion of important sites for terrestrial biodiversity which are covered by protected areas	The proportion of important sites for terrestrial biodiversity that are covered by protected areas, by ecosystem type. SDG Target Addressed: By 2020, ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements. [United Nations Statistics Division/ UNEP-WCMC and IUCN 2018]	Biodiversity sustains economic growth and environmental sustainability. Data have a positive relationship with green growth. Links to SDG 2 Zero hunger; SDG 15 Life on land
3rd Dimension: institutional capacity			
Policy	Government Effectiveness	Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. [World Bank]	The capacity of a government to provide public services is crucial to mitigating and adapting to disaster risks and impacts. Data have positive relationship with green growth. Links to SDG 16, on peace, justice, and strong institutions; SDG 17, on partnership for the goals.
Economic growth generation	Gross capital formation growth	Computed average of five years' growth rate of gross capital formation based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. Gross capital formation, formerly gross domestic investment, consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements, such as fences, ditches and drains; plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. [World Bank national accounts data and OECD National Accounts data files]	Capacity of public and private institutions to build facilities can help society to adapt to disaster impacts. For example, roads and hospitals are necessary facilities during disasters. Data have positive relationship with green growth. Links to SDG 8, on decent work and economic growth; SDG 9, on industry, innovation, and infrastructure; SDG 17, on partnership for the goals.

Public service	Online Service Index	The online services component of the E-Government Development Index (EGDI) is a composite indicator measuring the use of information and communication technologies by governments to deliver public services at the national level. [United Nations Department of Economic and Social Affairs, UNDESA]	The capacity of a government to provide information through a modern communication system is critical to recovering from a disaster and develop a resilient society. Data have positive relationship with green growth. Links to SDG 9, on industry, innovation, and infrastructure; SDG 16, on peace, justice and strong institutions.
3rd dimension: Infrastructure availability			
Transportation service	Passenger vehicles per 1000 inhabitants	Passenger cars refer to road motor vehicles, other than motorcycles, intended for the carriage of passengers and designed to each seat no more than nine persons, including the driver. The term "passenger car" therefore covers microcars — which need no permit to be driven — taxis, and hired passenger cars, provided that they have fewer than 10 seats. [International Road Federation]	Availability of transportation helps in disaster recovery and builds a resilient society. Data has positive relationship with green growth. Links to SDG 9, on industry, innovation, and infrastructure; SDG 11, on sustainable cities and communities; SDG 13, on climate action.
Electricity sources diversity	Diversity of electricity mix (Herfindahl)	The electricity generation mix is a useful indicator of the trends in the diversity and origin of electricity. The electricity system is undergoing a period of significant change as we transition from a large-scale conventional fossil fuel-dominated generation mix to intermittent renewable generation. (https://www.ofgem.gov.uk/) [International Energy Agency]	Different sources of energy help build a resilient society. Data have a positive relationship with green growth. Links to SDG 7, on affordable and clean energy; SDG 9, on industry, innovation, and infrastructure; SDG 11, on sustainable cities and communities; SDG 13, on climate action.
Communication	Mobile cellular subscriptions per 100 people	Mobile cellular phone subscriptions are subscriptions to a public mobile phone service that provides access to the PSTN using cellular technology. The indicator includes and is split into the number of postpaid subscriptions and the number of active prepaid accounts that have been used during the last three months. The indicator applies to all mobile cellular subscriptions that offer voice communications. [International Telecommunication Union, World Telecommunication/ICT Development Report and database]	The use of mobile phones has been critical in supporting people affected by and coordinating support during disasters. Data have a positive relationship with green growth. Links to SDG 9, on industry, innovation and infrastructure; SDG 11, on sustainable cities and communities; SDG 13, on limate action.
3rd dimension: Natural disaster impacts			
Natural disasters	Share of global disaster	Include disasters from natural hazards: meteorological, which are caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days; hydrological, which are caused by the occurrence, movement, and distribution of surface and subsurface freshwater and saltwater; climatological, which caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability; and biological, which are hazards caused by the exposure to living organisms and their toxic substances, for instance, parasites, bacteria, or viruses, such as malaria. [Centre for Research on the Epidemiology of Disasters]	Some countries are more vulnerable to natural disasters than others. Resilience to risks can be affected by the frequency and types of disasters. Data have a negative relationship with green growth. Links to SDG 1, on no poverty; SDG 11, on sustainable cities and communities; SDG 13, on climate action.
Disaster impacts	Total affected by disaster (percentage of population)	The proportion of the population affected by natural disasters. [Centre for Research on the Epidemiology of Disasters]	Impacts of disasters can be measured by the number of affected people. The larger the number of affected people the more difficult it would be to recover from disasters due to the magnitude of impacts and the logistics required to support them. Data have a negative relationship with green growth. Links to SDG 1, on no poverty, SDG 11, on sustainable cities and communities; SDG 13, on climate action.

4th dimension: Green investment			
Investment in mitigation	Renewable electricity output (% of total electricity output) growth	Computed five years' compound growth in renewable electricity as a share of electricity generated by renewable power plants of the total electricity generated by all types of plants. [International Energy Agency]	Investment in renewable energy, such as electricity, can support mitigation initiatives. Data have positive relationship with green growth. Links to SDG 7, on affordable and clean energy; SDG 9, on industry, innovation, and infrastructure; SDG 12, on responsible production and consumption; SDG 13, on climate action.
Investment in adaptation	Economic readiness to leverage private and public sector investment for adaptive actions	Readiness to make effective use of investments for adaptation actions, thanks to a safe and efficient business environment. ND-GAIN measures overall readiness by considering three components: economic readiness, governance readiness, and social readiness. The World Bank Doing Business indicators have been used by many studies to evaluate countries' investment climate by measuring procedures, time and cost of performing business activities through business life cycles (Commander & Svejnar, 2011; Hallward-Driemeier & Pritchett, 2011; Morris & Aziz, 2011; Collier & Duponchel, 2013). As the economic readiness in ND-GAIN seeks to capture the business condition that attracts adaptation investment, a description of the general investment climate is a good proxy for the economic component of readiness. [World Bank]	Investment to enhance adaptive capacity will help build resilience of communities. Data have a positive relationship with green growth. Links to SDG 9, on industry, innovation, and infrastructure; SDG 13, on climate action; SDG 17, on partnerships for the goals.
4th dimension: Green innovation			
Capital productivity	Growth GVA (Productivity)	Computed five years' compound growth rate of the total value added (GVA). Gross value added is the value of output minus the value of intermediate consumption. It is a measure of the contribution to GDP made by an individual producer, industry or sector. [World Bank national accounts data and OECD National Accounts data files]	Growth in GVA measures how labor and capital are efficiently used through new technologies and innovative ideas. Data have positive relationship with green growth. Links to SDG 8, on decent work and economic growth; SDG 9, on industry, innovation, and infrastructure.
Labor efficiency	Growth rate of real GDP per employed person	Computed five years' average growth rate of real GDP per employed person. Achieve higher levels of economic productivity through diversification, technological upgrading, and innovation, including through a focus on high-value added and labor-intensive sectors. U.N. data for SDG indicators. [International Labour Organization]	An increase in labor productivity through innovation supports green growth. But it will be important to use data related to green employment as they become available. Data have a positive relationship with green growth. Links to SDG 8, on decent work and economic growth; SDG 9, on industry, innovation and infrastructure.
4th dimension: Green employment			
Available employment	Employment (to population ratio, 15+, total) growth	Computed five years' compound growth in employment and population ratio, which is the proportion of a country's population that is employed. Employment is defined as persons of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period, that is, as those who worked in a job for at least one hour, or not at work due to temporary absence from a job, or to working-time arrangements. People aged 15 and older are generally considered to compose the working-age population. [International Labour Organization]	This is only proxy data because no data is available yet on green employment. Data have a positive relationship with green growth. Link to SDG 1, on no poverty; SDG 8, on decent work and economic growth; SDG 10, on reduced inequalities.
Decent employment	Wage and salaried workers, total (% of total employment)	Computed five years' compound growth rate in wage and salaried workers (employees or workers who hold the type of jobs defined as "paid employment jobs," where the incumbents hold explicit — written or oral — or implicit employment contracts that give them a basic remuneration that is not directly dependent upon the revenue of the unit for which they work. [International Labour Organization]	Decent employment supports green growth and aligns with SDG targets on employment. Data have a positive relationship with green growth. Links to SDG 1, on no poverty; SDG 8, on decent work and economic growth.

5th dimension: Access to basic services			
Drinking water	Population with access to drinking water	Drinking water services refers to the accessibility, the availability, and the quality of the main water source used by households for drinking, cooking, personal hygiene, and other domestic uses. [World Health Organization and United Nations Children's Fund]	The provision of drinking water is one of the most important basic services, where quality — for instance offering safe drinking water — is also related to health. Data have positive relationship with green growth. Links to SDG 3, on good health and well-being; SDG 6, on clean water and sanitation; SDG 10, on reduced inequalities.
Sanitation	Population with access to sanitation	Improved sanitation facilities are those designed to hygienically separate excreta from human contact. These include wet sanitation technologies, such as flush and pour flush toilets connecting to sewers, septic tanks or pit latrine, as well as dry sanitation technologies, such ventilated improved pit latrines, pit latrines with slabs, or composting toilets. Improved facilities shared with other households have previously been reported separately and did not count toward the Millennium Development Goal target. [World Health Organization and United Nations Children's Fund]	Sanitation is one of the most important basic services, where quality, that is improved sanitation, is also related to the health of people and the environment. Data have positive relationship with green growth. Links to SDG 3, on good health and well-being; SDG 6, on clean water and sanitation; SDG 10, on reduced inequalities.
Electricity	Population with access to electricity	The percentage of total population with access to electricity. It will be more useful to consider access by the rural population to renewable electricity, but data are not yet available. [World Bank, International Energy Agency, and the Energy Sector Management Assistance Program]	Electricity is one of the most important basic services, where renewable sources of electricity could contribute more to green growth. Data have positive relationship with green growth. Links to SDG 3, on good health and well-being; SDG 7, on affordable and clean energy; SDG 10, on reduced inequalities.
Education	Human Capital Index	The Human Capital Index measures countries' ability to maximize and leverage their human capital endowment. The four components of the index are adult literacy rate; the combined primary, secondary and tertiary gross enrolment ratio; expected years of schooling; and average years of schooling. [United Nations Department of Economics and Social Affairs]	Education is one of the most important basic services that will allow people to contribute more effectively and productively to green growth. Data have positive relationship with green growth. Links to SDG1, on no poverty; SDG 4, on quality education; SDG 10, on reduced inequalities.
5th dimension: Access to capital/resources			
Food security	Prevalence of undernourishment (% of population)	Population below the minimum level of dietary energy consumption, which is also referred to as the prevalence of undernourishment, shows the percentage of the population whose food intake is insufficient to meet dietary energy requirements continuously. Data showing as 5 may signify a prevalence of undernourishment below 5 percent. [Food and Agriculture Organization]	The availability and affordability of nutritious food is important to the health of the people and enables them to contribute better to green growth. Data have a positive relationship with green growth. Links to SDG 1, on no poverty; SDG 2, on zero hunger; SDG 3, on good health and well-being; SDG 10, on reduced inequalities.
Fuels	Access to clean fuels and technologies for cooking (% of population)	Access to clean fuels and technologies for cooking is the proportion of total population primarily using clean cooking fuels and technologies for cooking. Under World Health Organization guidelines, kerosene is excluded from clean cooking fuels. [World Bank, WHO Global Household Energy database]	Clean fuels and technologies are important to the health of the people and enables them to contribute better to green growth. Data have a positive relationship with green growth. Links to SDG 1, on no poverty; SDG 2, on zero hunger; SDG 3, on good health and well-being; SDG 10, on reduced inequalities; SDG 13, on climate action.

Income equality	Inequality-adjusted Income Index	HDI Income Index adjusted for inequality in income distribution based on data from household surveys. [United Nations Development Programme]	Equality in income contributes to equal opportunities and a better working environment, which improve labor productivity and economic growth. Data have positive relationship with green growth. Links to SDG 1, on no poverty; SDG 8, on decent work and economic growth; SDG 10, on reduced inequalities.
Access to property, including land	Registering property	Property rights examine the steps, time, and cost involved in registering property; measures the quality of the land administration system, including the reliability of infrastructure, the transparency of information, geographic coverage, land dispute resolution, and equal access to property rights. [World Bank]	Equal property and land rights create equal opportunities to and reduce conflicts in society, which enhance green growth. Data have a positive relationship with green growth. Links to SDG 1, on no poverty; SDG 2, on zero hunger; SDG 10, on reduced inequalities; SDG 16, on peace, justice, and strong institutions.
5th dimension: Gender equality			
Basic rights	Gender Inequality Index (GII)	It measures gender inequalities in three important aspects of human development: reproductive health, as measured by the maternal mortality ratio and adolescent birth rates; empowerment, as measured by the proportion of parliamentary seats occupied by females and the proportion of adult females and males aged 25 and older with at least some secondary education; and economic status, as expressed by labor market participation and measured by labor force participation rate of female and male populations aged 15 and older. [United Nations Development Programme]	Equal rights to women enable them to contribute to green growth. Data have a positive relationship with green growth. Links to SDG 5, on gender equality; SDG 10, on reduced inequalities; SDG 16, on peace, justice, and strong institutions.
Incentive or capacity to work	Accessing institutions	Accessing institutions explores women's ability to interact with public authorities and the private sector in the same ways as men, through examining constraints on women's decision-making and freedom of movement. [World Bank]	Equal access to institutions enables more women to participate in important positions in the public and private sectors. Data have positive relationship with green growth. Links to SDG 5, on gender equality; SDG 10, on reduced inequalities; SDG 16, on peace, justice, and strong institutions.
Decent employment	Vulnerable employment, female (% of female employment)	Vulnerable employment, often unprotected by labor legislation, is contributing family workers and own-account workers, as opposed to wage and salaried workers, as a percentage of total employment. The average of male and female. [International Labour Organization]	Decent employment contributes to safety and security at work and enables women to contribute more productively to green growth. Data have positive relationship with green growth. Links to SDG 5, on gender equality; SDG 8, on decent work and economic growth; SDG 10, on reduced inequalities; SDG 16, on peace, justice, and strong institutions.

Appendix 2. Photos and details of experts who participated in the regional workshops

Asia-Pacific Regional Expert

Name	Organization	Country
Akhanda Sharma	Ministry of Forests and Environment	Nepal
Amphayvan Chanmany	National Institute for Economic Research	Laos
Chittinee Charoenchitt	Office of Natural Resources and Environmental Policy and Planning	Thailand
Christian Mortelliti	Environment and Development Division, UNESCAP	Thailand
Gao Dongfeng	China National Institute of Standardization	China
Hellen Wilson Tom	Department of Energy	Vanuatu
Jiranut Silamut	Office of Natural Resources and Environmental Policy and Planning	Thailand
Mary Descery Joy B. Bongcac	National Economic and Development Authority	Philippines
Minh Hue Tran	Ministry of Planning and Investment	Vietnam
Montri Chamnanrot	Thailand Environment Institute	Thailand
Nanik Supriyani	BPS-Statistics Indonesia	Indonesia
Nidatha Martin	Climate Change & Development Authority	Papua New Guinea
Nyo Mar Htwe	Yezin Agricultural University	Myanmar
Pathom Chaiyapruksaton	Thailand Greenhouse Gas Management Organization	Thailand
Saykam Voladet	National Institute for Economic Research	Laos
Sirikanda Watcharathai	Thailand Greenhouse Gas Management Organization	Thailand
Turbadrakh Tumenjargal	Ministry of Environment and Tourism	Mongolia
Vannakreth San	Ministry of Planning	Cambodia

African Regional Experts

Name	Organization	Country
Aboubacry Diallo	Corporate Planning and Policy Branch/MEFP	Senegal
Achraf Lachkar	National Accounts Department	Morocco
Belaynesh Beru	Ministry of Water, Irrigation and Energy	Ethiopia
Dawit W. Mulat	Ethiopian Development Research Institute	Ethiopia
Eden Seyoum	Ministry of Industry	Ethiopia
Gelila Abebe	Initiative Africa	Ethiopia
Gerald Esambe Njume	African Development Bank	
Hermela Wondwossen	GGGI-Ethiopia	Ethiopia
Hicham Makkaoui	Department of Planning	Morocco
Jieun Seong	KOICA Ethiopia Office	Ethiopia
Magecha Mamuye	Ministry of Urban Development and Housing	Ethiopia
Mustafa Abu	Ministry of Agriculture and Natural Resource	Ethiopia
Rebecca Teklu Bekele	Agricultural Transformational Agency	Ethiopia
Ronald Kaggwa	National Planning Authority	Uganda
Salvo Tchamo	Ministry of Land, Environment and Rural Development	Mozambique
Selam Tarekegn	Industrial Parks Development Corporation	Ethiopia
Shimels Fikadu	African Development Bank	
Wondimu Abeje	Addis Ababa University-College of Development Studies	Ethiopia
Yetatek Yitbarek	Ethiopian Development Research Institute	Ethiopia
Yizengaw Yitayeh	Ministry of Transport	Ethiopia
Zerihun Estifanos	Ministry of Finance and Economic Cooperation	Ethiopia

LAC Regional Experts

Name	Organization	Country
Claudia Sanchez	Secretaría de Medio Ambiente y Recursos Naturales	Mexico
Federico González	Instituto Nacional de Estadística y Geografía	Mexico
Felipe Cortés	Ministry of Environment	Chile
Gavin Bovell	Office of Climate Change	Guyana
Javier Turrent	Secretaría de Medio Ambiente y Recursos Naturales	Mexico
Joan John-Norville	OECS Commission	St. Lucia
Jose Manuel Sandoval	GGGI-Colombia	Colombia
Julieta Leo	Centro Mario Molina	Mexico
María Clemencia Castellano	GGGI-Colombia	Colombia
Pablo Martínez	GGGI-México	Mexico
Rocio Ruelas	Sonora	Mexico
Rodolfo Garza Castro	Instituto Nacional de Ecología y Cambio Climático	Mexico
Sandra Fernandez	Ministerio de Medio Ambiente y Desarrollo Sostenible de Paraguay	Paraguay
Silvia Rojas	Ministerio de Ambiente y Energía	Costa Rica

MENA Regional Experts

Name	Organization	Country
Abeer Al-Aysah	Federal Competitiveness and Statistics Authority	United Arab Emirates
Amna AlSuwaidi	Zayed University	United Arab Emirates
Ayad Hamzah	Dubai Municipality	United Arab Emirates
Bilal Jaber	Road and Transport Authority	United Arab Emirates
Fatima Habshi	Ministry of Climate Change and Environment	United Arab Emirates
Fatima Kokhardi	Ministry of Climate Change and Environment	United Arab Emirates
Fatmah AlHantoubi	Department of Transport	United Arab Emirates
Humaid Kanji	Environment Agency	United Arab Emirates
Hussein Hamed	Environment Agency	United Arab Emirates
Jehan Haddad	Royal Scientific Society	Jordan
Jihad Alsawair	Ministry of Environment	Jordan
Maha Al Ma'ayta	Ministry of Environment	Jordan
Mashael Al Ansari	Ministry of Climate Change and Environment	United Arab Emirates
Mouza Al Zaabi	Environment Agency	United Arab Emirates
Mouza Alghfeli	Zayed University	United Arab Emirates
Mubarak Al Juaidi	Department of Transport	United Arab Emirates
Naoko Machiba	Ministry of Climate Change and Environment	United Arab Emirates
Peter Farrington	Dubai Municipality	United Arab Emirates
Roda Al Haj Naser	Zayed University	United Arab Emirates
Tala AbuShuqair	Ministry of Infrastructure Development	United Arab Emirates
Tomoo Machiba	Ministry of Climate Change and Environment	United Arab Emirates

Appendix 3. AHP questionnaire on assigning weights to the indicators

Name: _____

Organization: _____

Opinions on weights on indicators

Intensity of importance	Definition
1	**Equal importance**
2	Weak
3	**Moderate importance**
4	Moderate plus
5	**Strong importance**
6	Strong plus
7	**Very strong or demonstrated importance**
8	Very, very strong
9	**Extreme importance**

Resource efficiency

Question: Which is more important…?	Answer: a, b, or c	Give Intensity
(a) Energy efficiency or (b) water efficiency		
(a) Energy efficiency or (c) land use efficiency		
(b) Water efficiency or (c) land use efficiency		

Natural capital protection

Question: Which is more important…?	Answer: a, b, or c	Give Intensity
(a) Pollution reduction or (b) ecosystem management		
(a) Pollution reduction or (c) biodiversity conservation		
(b) Ecosystem management or (c) biodiversity conservation		

Resilience to risks

Question: Which is more important…?	Answer: a, b, or c	Give Intensity
(a) Institutional capacity or (b) infrastructure availability		
(a) Institutional capacity or (c) natural disaster impacts		
(b) Infrastructure availability or (c) natural disaster impacts		

Green economic opportunities

Question: Which is more important…?	Answer: a, b, or c	Give Intensity
(a) Green investment or (b) green innovation		
(a) Green investment or (c) green employment		
(b) Green innovation or (c) green employment		

Social Inclusion

Question: Which is more important…?	Answer: a, b, or c	Give Intensity
(a) Access to basic services or (b) access to capital/resources		
(a) Access to basic services or (c) gender equality		
(b) Access to capital/resources or (c) gender equality		

If any, please write reasons for the weights you have given on each dimension on the back page.

Appendix 4. Availability of data suggested by the regional experts

Indicator and data	New indicator suggestions from regional experts, if any	GGGI search result, if available	No. of country coverage (approx.)	Years available	Source of data*
1. Resource efficiency					
1.1 Energy efficiency	*Other sectors should also be considered (e.g., fisheries, forestry, etc.) *Add material flow accounting and material productivity *Indicators based on the clean energy source *Add energy consumption per capita *Energy production	*Energy used in agriculture and forestry (FAO, 2009, 111 countries)	111	2005–2009	FAO
		*Total final consumption by fuel (IEA, 2015, ktoe, ~170 countries) (already used in GGPM)	170	2015	IEA
		*Total primary energy supply by fuel (IEA, 2015, ktoe, ~170 countries)	170	2015	IEA
		*IEA's Energy Efficiency Indicators Database covers end use energy consumption for 8 energy products and includes end use energy efficiency indicators and carbon intensity indicators for 4 sectors (residential, services, industry and transport) for IEA member countries			
		*Energy use (kg of oil equivalent per capita) (WB, 2014, ~210 countries, EG.USE.PCAP.KG.OE)	210	2010–2014	WB
		*Energy efficiency score (Regulatory Indicators for Sustainable Energy, ~110 countries)	110	2016	RISE
1.1.a Total final energy consumption/GDP	*Renewable Energy *Proportion of renewable energy to energy/electricity mix *Production *Transmission *Consumption *A sectoral approach for the energy intensity indicator	*Electricity production from renewable sources, excluding hydroelectric (% of total) (WB, 2015, ~210 countries, EG.ELC.RNWX.ZS)	210	2010–2015	WB
		*Electricity mix: the breakdown of different fuels used to generate electricity. (IEA, 2015, ~170 countries)	170	2015	IEA
		*Total final consumption by fuel (IEA, 2015, ktoe, ~170 countries) (already used in GGPM)	170	2015	IEA
		*Total primary energy supply by fuel (IEA, 2015, ktoe, ~170 countries)	170	2015	IEA
		*Energy intensity of the industry sector (IEA, 2015, MJ per GDP, ~170 countries)	170	2015	IEA
1.1.b Transmission and distribution losses electricity	*Access to electricity *Sources of power *Generation of electricity *Transmission *Consumption *Should be integrated into the indicator above	*Electric power transmission and distribution losses (% of output) (WB, % of output, 2014, ~210 countries, EG.ELC.LOSS.ZS) (already used in GGPM)	210	2010–2014	WB
1.2 Water efficiency	*Other sectors should also be considered (e.g., fisheries, forestry, etc.). *Access to sanitation facilities *Reuse and recycle the wastewater generated *The origin of water source, domestic water *Drinking water losses in the distribution system *Percentage of TSE reuse *Consumption rate per capita and per GDP, by sector *Groundwater consumption reduction (percentage) *Measure the optimization of using treated water rather than freshwater *The efficiency of storing rainwater	*SDG6.2.1: the proportion of population using safely managed sanitation services, including a handwashing facility with soap and water (SDG, 2015, 107 countries)	107	2011–2015	SDG
		*Capacity of the municipal wastewater treatment facilities (FAO Aquastat, 2012, ~10 countries)	10	2003–2012	FAO Aquastat
		*Number of municipal wastewater treatment facilities (FAO Aquastat, 2008 –2016 depends on country, 98 countries)	98	2008–2016	FAO Aquastat
		*Total renewable water resources per capita (m3/inhab/year) (FAO Aquastat, 2014, ~180 countries)	180	2012, 2014	FAO Aquastat
		*Fresh groundwater withdrawal (primary and secondary) (FAO Aquastat, 2014, <80 countries)	80	2003-–2014	FAO Aquastat
		*Groundwater produced internally (FAO Aquastat, 2014, 170 countries)	170	2012, 2014	FAO Aquastat
		*Total renewable groundwater (FAO Aquastat, 2014, 170 countries)	170	2012, 2014	FAO Aquastat
		*Dependency ratio (FAO Aquastat, 2014, 194 countries)	194	2012, 2014	FAO Aquastat
		*(By country data unavailable for water loss in distribution system)	n/a	n/a	Water and Wastewarter Int'l
		*Agricultural water withdrawal as % of total water withdrawal (FAO Aquastat, 2005–2015 depends on country, ~80 countries)	80	2005–2015	FAO Aquastat
		*Industrial water withdrawal as % of total water withdrawal (FAO Aquastat, 2005–2015 depends on country, ~80 countries)	80	2005–2015	FAO Aquastat
		*Municipal water withdrawal as % of total water withdrawal (FAO Aquastat, 2005–2015 depends on country, ~80 countries)	80	2005–2015	FAO Aquastat
		*Dam capacity per capita (FAO Aquastat, 2008–2015 depends on country, ~140 countries)	140	2008–2015	FAO Aquastat
1.2.a Freshwater withdrawal	*Seawater treatment *Water network loss	*Desalinated water produced (FAO Aquastat, 2013, less than 10 countries) *(By country data unavailable for Water Loss)	10	2005–2013	FAO Aquastat

1.2.b Irrigated cropping intensity (%)	*Access to imported water sources *High irrigation for agricultural purposes *Include other sectors (e.g., industrial water-usage) *Add data related to basin transferences *Include other sectors that consume water as fish farming and industrial use and effluents	*Dependency ratio (FAO Aquastat, 2014, 194 countries)	194	2012, 2014	FAO Aquastat
		*Irrigation water withdrawal. (FAO Aquastat, 2010–2015 depends on country, ~50 countries) Annual quantity of water withdrawn for irrigation purposes.	50	2010–2015	FAO Aquastat
		*Water Withdrawal by Sector (FAO Aquastat) (agricultural, industrial, municipal) (FAO Aquastat, 2005–2015 depends on country, ~80 countries)	80	2005–2015	FAO Aquastat
		*(Basin transferences data by country unavailable)	n/a	n/a	n/a
1.3 Land-use efficiency	*Other sectors should be considered (e.g., fisheries, forestry, etc.) *Rehabilitated mined-out area as a proportion of total mining *Urban land efficiency use (m2/inhabitant) *Degradation and deforestation *Livestock production and different agriculture techniques *Blue carbon and tidal areas *Optimal land planning (think of urban settings and small islands) *Crop Diversity Index, agricultural production per capita *Use SDG11 for sustainable cities growth	*Agricultural land (% of land area) (WB, 2015, ~210 countries, AG.LND.AGRI.ZS)	210	2011–2015	WB
		*Forest area (% of land area) (WB, 2015, ~210 countries, AG.LND.FRST.ZS)	210	2011–2015	WB
		*(WB mining data only for 2 countries)	2	2016	WB
		*Share of world mineral production 2016 by countries (World Mining Data, 2016, ~80 countries depend on mineral)	80	2015, 2016	World Mining Data
		*urban_agglomeration_land_area (UN-Habitat, 2013, 42 cities)	42 cities	2013	UN Habitat
		*Annual deforestation (% of change) (WB, 2015, 75 countries, ER.FST.DFST.ZG)	75	2010, 2015	WB
		*Density of livestock in the agricultural area (FAO, 2016, 216 countries)	216	2002–2016	FAO
		*SDG 11.1.1: Proportion of urban population living in slums, informal settlements, or inadequate housing (SDG, 2014, 105 countries)	105	2010, 2014	SDG
		*ODA received in small island developing states as a proportion of their gross national incomes (Millennium Development Goals Indicators UN, 2009–2013, 37 countries)	37	2009–2013	UN MDGI
1.3.a Agricultural output/ hectare	*Growing population affecting agricultural output/ hectares *Soil fertility issues *Food security issues *Nutrition issues *Available arable land *Urban sector *Forest sector *Land use change *Rate of urban area related to population increase *Agricultural boundary *Cost of transportation in agriculture *Environment-friendly technologies to increase agricultural land productivity *Sustainable agriculture, such as organic production, use of agrochemicals, GHG emission	*Urban population growth (annual %) (WB, 2017, ~210 countries, SP.URB.GROW)	210	2013–2017	WB
		*Trend of Soil Health Index (FAO, 2005, 162 countries)	162	2005	FAO
		*Suite of Food Security Indicators (FAO, 2016, ~200 countries)	200	2012–2016	WB
		*Global Hunger Index (GHI) (The Land Portal, 1992, 94 countries)	94	1992	FAO
		*Prevalence of undernourishment (% of population) (WB, 2016, ~210 countries, SN.ITK.DEFC.ZS)	210	2012–2016	WB
		*Agricultural land (% of land area) (WB, 2015, ~210 countries, AG.LND.AGRI.ZS)	210	2011–2015	WB
		*Forest area (% of land area) (WB, 2015, ~210 countries, AG.LND.FRST.ZS)	210	2011–2015	WB
		*Urban land area (sq. km) (WB, 2010, ~210 countries, AG.LND.TOTL.UR.K2)	210	2000, 2010	WB
		*Land area (sq. km) (WB, 2017, ~210 countries, AG.LND.TOTL.K2)	210	2013–2017	WB
		*Cost estimated based on: gross production value, net production value (FAO, 2016, 140 countries)	140	2012–2016	FAO
		*Use of pesticides (FAO, 2016, ~90 countries)	90	2012–2016	FAO
		*Consumption of fertilizers (FAO, 2002, 185 countries)	185	1998–2002	FAO
		*Agricultural area organic, total (Land Portal, 2017, 159 countries)	159	2008, 2017	FAO
		*Conservation agriculture area as % of arable land area (FAO Aquastat, 2005–2015, 54 countries)	54	2005–2015	FAO Aquastat
1.3.b Crop Diversification Index	*Climate-smart agriculture *Urban land use *Different kind of crops within species *Livestock *Crop diversity, methodology uncertain, depending on countries	*CSA country profiles (29 country reports, 2014–2018, CIGAR)	29	2014–2018	CIGAR
		*Urban land area (sq. km) (WB, 2010, ~210 countries, AG.LND.TOTL.UR.K2)	210	2000, 2010	WB
		*Crops statistics (FAO, 2016, ~180 countries)	180	2012–2016	FAO
		*Livestocks primary (FAO, 2016, ~200 countries)	200	2012–2016	FAO

2. Natural capita protection					
2.1 Pollution reduction	*Incidents on respiratory diseases *Air pollution caused by SO2 *Water treatment (% of water treated as sewage generation, YALE-EPI). *Global soil health (FAO) *Provides insight of soil damage and for noise *Chemicals and hazardous pollution data *Air quality index (CO2 is not pollutant) consider water quality parameters	*DALYs (disability-adjusted life years) of chronic respiratory diseases (IHME, no data)	n/a	n/a	IHME
		*World Health Statistics 2008 (mortality and burden of disease, WHO, 2008, ~200 countries)	200	2008	WHO
		*Emissions by country and main source category – SO2 (EDGAR, 1970-2012, ~200 countries)	200	1970–2012	EDGAR
		*Wastewater treatment (YALE-EPI, 2012, ~230 countries, WAS-TECXN)	230	2012	YALE-EPI
		*Average carbon content in the topsoil as a % in weight (FAO, 2008, ~200 countries)	200	2008	FAO
		*Air quality index (map only)	80	Real time	World Air Quality Index
		*Water Quality Index (YALE-EPI, 2010, ~230 countries)	230	2010	YALE-EPI
2.1.a CO2 / GDP	*Climate resilience strategies are more a concern for governments	*Vulnerability to climate change (ND-GAIN Index, 2016, ~200 countries)	200	2011–2016	ND-GAIN
		*CAIT: Countries' pre-2020 climate pledges submitted to the UNFCCC (World Resources Institute, info data, 73 countries, 1990–2010)	73	1990–2010	WRI
		*CAIT: UNFCCC annex I GHG emissions data (WRI, 1990–2011, ~45 countries)	45	1990–2011	WRI
		*CAIT: Country greenhouse gas emissions data (WRI, 1990–2012, ~190 countries)	190	1990–2012	WRI
2.1.b PM2.5 Exposure	*PM2.5 chemical composition	*SDG 11.6.2: Annual mean levels of fine particulate matter (e.g., PM2.5 and PM10) in cities (population weighted) (SDG, 2016, 210 countries)	210	2016	SDG
2.1.c Ambient Ozone	*Urbanization *Other persistent organic pollutants *Health indicator, such as hospitals, mortality	*Urban population growth (annual %) (WB, 2017, ~210 countries, SP.URB.GROW)	210	2013–2017	WB
		*Stockholm Convention on persistent organic pollutants (details of pollutants by cities, Global Monitoring Plan Data Warehouse, 2010 time series)	n/a	n/a	POPs GMP
		*Disability-adjusted life years (DALYs) due to ambient ozone pollution (IHME, 2016, 192 countries) (already used in GGPM)	192	2016	IHME
2.1.d Unsafe water sources	*Water quality parameter *Safe drinking water sources *Water quality	*Disability-adjusted life years (DALYs) due to unsafe water source (IHME, 2016, 192 countries) (already used in GGPM)	192	2016	IHME
		*Water quality (Global Open Data Index, 2015, ~90 countries)	90	2013–2015	Global Open Data Index
		*Total exploitable water resources (FAO Aquastat, 2012, 42 countries)	42	2007, 2012	FAO Aquastat
2.2 Ecosystem management	*Coverage of protected areas in general (terrestrial and marine) *Changes in land use, percentage of national surface as a natural protected area *Percentage of marine conservation areas based on territory *Island management *Management Effectiveness Tracking Tool (METT, WB)	*SDG 15.1.2: Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (SDG, 2018, ~240 countries) (already used in GGPM)	240	2014–2018	SDG
		*SDG14.5.1: Coverage of protected areas in relation to marine areas (SDG, 2017, ~200 countries)	200	2017	FAO
		*Land under protective cover (FAO, 2013-2016, < 10 countries)	10	2013–2016	FAO
		*Small island developing states (no dataset)	n/a	n/a	UN
		*The Global Database on Protected Area Management Effectiveness (profiles by country)	170	2010–2018	GD-PAME
		*Protected Planet Report 2016: data, maps & figures (April 2016) (Protected Planet UNEP-WCMC, 2018, ~200 countries)	200	2016	UN-EP-WC-MC
		*ISO 14001: Environmental management systems, requirements with guidance for use (ISO, 2017, ~200 countries)	200	2011–2017	ISO
2.2.a Coverage of protected areas	*Marine ecosystem *Budget for protected areas and its relevance to MRV and management system *Endemic species	*SDG14.5.1: Coverage of protected areas in relation to marine areas (SDG, 2017, ~200 countries) (already used in GGPM)	200	2017	SDG
		*Environmentally related government R&D budget, % total government R&D, Economic opportunities and policy responses (OECD, 1990-2016, ~40 countries)	40	1990–2016	OECD
		*Lima REDD+ Information Hub (UNFCCC, only 4 countries)	4	n/a	UNFCCC

2.2.c Soil threat	*Issues of food security *Land degradation *Fertilizer use *Soil threat index with baseline information coverage on total country land mass	*Suite of Food Security Indicators (FAO, 2016, ~200 countries)	200	2012–2016	WB
		*Global Hunger Index (GHI) (The Land Portal, 1992, 94 countries)	94	1992	FAO
		*Average carbon content in the topsoil as a % in weight (FAO, 2008, ~200 countries)	200	2008	FAO
		*Consumption of fertilizers (FAO, 2002, 185 countries)	185	1998–2002	FAO
2.2.d Natural resources depletion	*Crop and animal conservation *Adjusted savings for natural resources depletion	*SDG 2.5.1: Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities (SDG, 2018, 200 countries)	200	2016, 2017	SDG
		*Adjusted savings: natural resources depletion (% of GNI) (WB, 2016, ~210 countries, NY.ADJ.DRES.GN.ZS) (already used in GGPM)	210	2012–2016	WB
2.3 Biodiversity conservation	*Environmental protection expenditure separated in private and public (BIOFIN, Environmental accounting). *Marine biodiversity	*Environmental protection expenditure and revenues (OECD, 2013, <20 countries)	20	2009–2013	OECD
		*Global Map of Hurlbert's Index of Biodiversity (map, UNEP-WCMC, Ocean data viewer, 2017)	n/a	2014	UN-EP-WC-MC
2.3.a Red List Index	*Biodiversity hotspot *Habitat destruction; human-wildlife conflicts; expansion of agricultural land *Budget used on each species *List of invasive species	*Biodiversity hotspot (biodiversitya-z.org, 2004, map)	n/a	2004	Conservation International
		*Global map of the Biodiversity Intactness Index (map, Biodiversity Indicators Partnership, Newbold et al. (2016))		1990–2010	BIP
		*(Data by country for budget unavailable)	n/a	n/a	IUCN
		*(Only species' names are shown, IUCN GISD) Global Invasive Species Database	n/a	n/a	IUCN-GISD
2.3.b Freshwater biodiversity in protected areas	*Ocean/marine biodiversity and conservation *Disaggregate into freshwater, terrestrial, and marine biological resources	*SDG14.5.1: coverage of protected areas in relation to marine areas (SDG, 2017, ~200 countries)	200	2017	SDG
		*SDG 15.1.2: proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (SDG, 2018, ~240 countries) (already used in GGPM)	240	2014-2018	SDG
2.3.c Terrestrial biodiversity in protected areas	*Cultural interferences in protected areas *Forest conservation *Arable land *Urbanization *Population growth *Disaggregate into freshwater, terrestrial, and marine biological resources	*(Website) Cultural and Spiritual Values of Protected Areas (Specialist Group of the IUCN World Commission on Protected Areas)	n/a	n/a	n/a
		*SDG 15.2.1: forest area net change rate (%) AG_LND_FRSTCHG (SDG, 2010, 2015, ~200 countries)	200	2000, 2015	SDG
		*Arable land (% of land area) (WB, 2015, AG.LND.ARBL.ZS)	260	2011-2015	WB
		*Population growth (annual %) (WB, 2017, ~210 countries, SP.POP.GROW)	210	2013-2017	WB
		*Urban population growth (annual %) (WB, 2017, ~210 countries, SP.URB.GROW)	210	2013-2017	WB
		*SDG14.5.1: coverage of protected areas in relation to marine areas (SDG, 2017, ~200 countries)	200	2017	SDG
		*SDG 15.1.2: proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (SDG, 2018, ~240 countries) (already used in GGPM)	240	2014-2018	SDG
3. Resilience to risks					
3.1 Institutional capacity	*Specific agency involved in disaster risk reduction (DRR) or including private sector implementing DRR initiatives *Number of DRR-enhanced sectoral/development plans *Corruption *National coverage of cellphones *Disaster caused by other impacts besides climate change	*SDG11.b.1: Score of adoption and implementation of national DRR strategies in line with the Sendai Framework (SDG, 2017, 15 countries)	15	2017	SDG
		*SDG11.b.2: Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (SDG, 2017, 15 countries)	15	2017	SDG
		*Corruption Perception Index (Transparency International, 2017, ~190 countries) https://www.transparency.org/news/feature/corruption_perceptions_index_2017	190	2017	Transparency International
		*Mobile cellular subscriptions (per 100 people) (WB, 2017, ~210 countries, IT.CEL.SETS.P2) (already used in GGPM)	210	2013-2017	WB

3.1.a Government effectiveness	*Inclusion of other stakeholders *Level of corruption *government efficiency *Type of governance structure *Human right issues *Policy implementation	*Government Effectiveness Index (website, TheGlobalEconomy.com, 2016, source: The World Bank)	193	2016	WB
		*Corruption Perception Index (Transparency International, 2017, ~190 countries)	190	2017	Transparency International
		*IDA Resource Allocation Index (WB, IQ.CPA.IRAI.XQ, 2017, 97 Countries)	97	2013-2017	WB
		*ITUC Global Rights Index (rankings in pdf, ITUC, 2018, ~150 countries)	150	2018	ITUC
		*The Fragile States Index (The Fund for Peace, 2018, 178 countries)	178	2018	The Fund of Peace
3.1.b Gross capital formation growth	-	-	-	-	-
3.1.c Online Service Index	*Development of ICT *Rule of law *Quality control *affordability *Society participation, e.g., number of social organizations per 1,000 inhabitants *Services besides Internet, such as coverage *Institutions having a back-up communications plan in case online services fail	*ICT Development Index 2017 (ITU, 2017, 176 countries)	176	2017	ITU
		*Proportion of population covered by at least a 3G mobile network (WB, 2015, 199 countries, IT_MOB_3GNTWK)	199	2016	WB
		*Mobile cellular subscriptions (per 100 people) (WB, 2017, ~210 countries, IT.CEL.SETS.P2)	210	2013–2017	WB
		*Gross ODA aid disbursement for social infrastructure & services, DAC donors total (current US$) (WB, Africa only ~60 countries, 2011, DT.ODA.DACD.SOCI.CD)	Africa 60	2007–2011	WB
3.2 Infrastructure availability	*Other early warning systems *DRR/emergency response facilities, e.g., hospitals, evacuation centers *Percentage of population with telephone or Internet access *Public transportation, roads infrastructure, number of hospitals, other kinds of communication, take into account the number of people that could help in a disaster or "first respondents" *Budget, evacuation plans, and exit roads *Travel distance per inhabitant or trip duration *Access to public transport	*SDG11.b.1: Score of adoption and implementation of national disaster risk reduction strategies in line with the Sendai Framework (SDG, 2017, 15 countries)	15	2017	SDG
		*SDG11.b.2: Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (SDG, 2017, 15 countries)	15	2017	SDG
		*Access to a mobile phone or Internet at home (% age 15+) (WB G20 financial inclusion indicators, 2014, ~200 countries)	200	2014	WB
		*SDG9.1.2: passenger and freight volumes, by mode of transport (SDG, 2016, ~200 countries)	200	2016	SDG
		*Air transport freight (million ton-km) (WB, 2017, 178 countries, IS.AIR.GOOD.MT.K1)	178	2013–2017	WB
		*Total road network (in km) (UN-Habitat, 2000, 138 countries)	138	2000	UN Habitat
		*Roads, paved (% of total roads) (WB, Africa ~60 countries, 2010, IS.ROD.PAVE.ZS)	Africa 60	2007–2010	WB
		*Total inland transport infrastructure investment (euro) (OECD International Transport Forum, 2016, ~45 countries)	45	2012–2016	OECD
		*Hospital beds (per 1,000 people) (WB, ~210 countries, 2012, SH.MED.BEDS.ZS)	210	2008–2012	WB
3.2.a Passenger vehicles per # inhabitants	*Road quality and accessibility between regions *Number of vehicles per household *Level of emissions from transport sector *Mass transportation and multi-modal transportation *Difference between least developed countries in terms of road infrastructure/vehicles and total population *Need categorization of vehicle considering electric vehicles *Social infrastructure *Infrastructure: Sanitation and health should be added *Diversity of emergency response vehicles	* Road quality indicator (World Economic Forum, 2015, 144 countries)	144	2015	WEF
		*Logistics Performance Index: quality of trade and transport-related infrastructure (1=low to 5=high) (WB, 2016, ~200 countries, LP.LPI.INFR.XQ)	200	2014, 2016	WB
		*Household consumption 2010 on transport by country, area and consumption segment in local currency, $PPP , and US$ (Million) (WB Global Consumption Database, 2010, data by city by product)	By cities	2010	WB Global Consumption Database
		*CO2 emissions from transport (% of total fuel combustion) (WB, 2014, ~200 countries, EN.CO2.TRAN.ZS)	200	2010–2014	WB
		*Electric car market share in the top eight Electric Vehicle Initiative countries (report, IEA)	n/a	n/a	IEA
		*Air transport, passengers carried (WB, 2017, ~200 countries, IS.AIR.PSGR)	200	2013–2017	WB
		*Infrastructure investment road / rail / air, (OECD, 49 countries, 2016)	49	2012–2016	OECD
		*Gross ODA aid disbursement for social infrastructure & services, DAC donors total (current US$) (Africa ~60, WB, 2011, DT.ODA.DACD.SOCI.CD)	Africa 60	2011	WB

3.2.b Diversity of electricity mix	*Proportion of renewable source of electricity	*Electricity mix: the breakdown of different fuels used to generate electricity (IEA, 2015, ~170 countries)	170	2015	IEA
3.2.c Mobile cellular subscriptions	*Broadband services *Internet access *Diversity of communication devices, e.g., ham radios, in case mobile services fail especially during or post-disaster event	*Fixed broadband subscriptions (per 100 people) (WB, 2017, ~210 countries, IT.NET.BBND.P2)	210	2013–2017	WB
		*Mobile cellular subscriptions (per 100 people) (WB, 2017, ~210 countries, IT.CEL.SETS.P2) (already used for GGPM)	210	2013–2017	WB
		*Percentage of individuals using the Internet (ITU, 2016, 195 countries)	195	2010, 2016	ITU
3.3 Natural disaster impacts	*Economic impact, e.g., number of house damage by disaster *Early warning system, risk planning programs, investment in disaster prevention, and cost of losses *Monetary value of natural disaster impacts *Time required to restore basic services	*Homeless: number of people whose house is destroyed or heavily damaged and therefore need shelter after an event (EMDAT, 2018, 142 countries)	142	2010–2018	EMDAT
		*SDG11.b.1: Score of adoption and implementation of national disaster risk reduction strategies in line with the Sendai Framework (SDG, 2017, 15 countries)	15	2017	SDG
		*SDG11.b.2: Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (SDG, 2017, 15 countries)	15	2017	SDG
		*Total damage ('000 $) (EMDAT, 2018, 142 countries)	142	2010–2018	EMDAT
3.3.a Share of global disaster	*Area/location *Transboundary *Meteorological information *Prevalence *Rate of response *Frequency and exposure *Consider coping capacity of the population *Vulnerability Index *Resilient green infrastructure specifically related to water-related disasters, climate-resilient road, buildings, cities, or other infrastructure	*Disaster type (EDMAT, 2018, 142 countries)	142	2010–2018	EMDAT
		*Disaster list: meteorological (EDMAT, 2018, 142 countries)	142	2010–2018	EMDAT
		*Vulnerability to climate change (ND-GAIN Index, 2016, ~200 countries)	200	2011–2016	ND-GAIN
		*Global Assessment Report on Disaster Risk Reduction (UNISDR, 2015, over 100 country profiles online)	100	2015	UNISDR
3.3.b Total affected by disaster	*Material and economic cost *Disaggregate data between rural and urban areas *Loss of natural reserves *Affected property *Infrastructure and economic impacts	*Total damage ('000 US$) (EDMAT, 2018, 142 countries)	142	2010–2018	EMDAT
4. Green economic opportunities					
4.1 Green investment	*Adaptation *Linked to the mitigation actions in the nationally determined contributions *Investment in R&D *Forestry carbon bonds, taking into account other sectors, such as waste and transport, water *Agencies that invest in green innovation *Share of the portfolio of commercial banks of development banks dedicated to green investments *Green economies, such as waste management *Public investments in sustainable/public transport systems	*(Need to set parameters as the database is comprehensive; not all countries) The Mitigation Content Database provides comprehensive and comparable data on countries' intended nationally determined contributions	n/a	n/a	WB
		*Research and development expenditure (% of GDP) (WB, 2015, 96 countries, GB.XPD.RSDV.GD.Z)	96	2011–2015	WB
		*Net total social expenditure, in % GDP (OECD, 1980-2016, ~35 countries)	35	1980–2016	OECD
		*Total inland transport infrastructure investment (Euro) (OECD International Transport Forum, 2016, ~45 countries)	45	2012–2016	OECD
		*Public private partnerships investment in water and sanitation (current US$) (not many countries have data, WB, 2016, 15 countries, IE.PPN.WATR.CD)	15	2012–2016	WB
		*Energy intensity measured in terms of primary energy and GDP (WB, 2015, ~210 countries, EG.EGY.PRIM.PP.KD)	210	2011–2015	WB
		*(Website) International Finance Corporation (WB)	n/a	n/a	IFC
		*IDA Country Performance Ratings (CPR) (WB IDA, 2014, ~80 countries)	80	2013–2014	WB IDA
		*IDA Resource Allocation Index (IRAI): 2017 Country Policy and Institutional Assessments (WB IDA, 2017, ~80 countries)	80	2017	WB IDA

4.1.a Renewable electricity output	*Investments in renewable energy *Focus on green projects *Include other sectors, e.g., forest *Green projects (green investment, green innovation, green jobs) *Renewable energy per electricity or total energy	*Renewable energy public RD&D budget, % total energy public % RD&D, (OECD, 2017, 20 countries)	20	2013–2017	OECD
		*RISE score, renewable energy (Regulator Indicators for Sustainable Energy, WB, 111 countries, 2016)	111	2016	RISE
4.1.b Economic readiness	*Focus on green projects	*Development of environment-related technologies, % of all technologies (OECD, 2014, 128 countries)	128	2010–2014	OECD
		*RISE score, energy efficiency (Regulator Indicators for Sustainable Energy, WB, 111 countries, 2016)	111	2016	RISE
4.2 Green innovation	*Intellectual property rights *Labor for green innovation *Number of patents related to green technologies or sectors (Global innovation Index)	*PCT patents, climate change mitigation technologies related to energy generation, transmission, or distribution, number (OECD, WB, latest value available, 97 countries)	97	2012–2017	OECD
		*Patents evolution of renewable energy technologies (IRENA, chart by country, 2015)	n/a	2015	IRENA
		*The Global Innovation Index (GII) (score, Cornell University, INSEAD, WIPO, 2018, 126 countries)	126	2018	Cornell University, INSEAD, WIPO
		*Intellectual property right: patent (WIPO, 2017, ~200 countries)	200	2016–2017	WIPO
		*Intellectual property right: patent grants by technology: environmental technology (WIPO, 2016, ~90 countries)	90	2012–2016	WIPO
4.2.a Growth GVA (productivity)	*Freen technologies *Focus on green projects	*Development of environment-related technologies, % of all technologies (OECD, 2014, 128 countries)	128	2010–2014	OECD
4.2.b Growth rate of real GDP	*Formal/informal sector in both the economic growth and the employment *Research and development *Focus on green projects *Technology development *Percentage of GDP growth that comes from green investments	*Informal employment (ILO, 2016, 40 countries)	40	2011–2016	ILO
		*Research and development expenditure (% of GDP) (WB, 2015, 96 countries, GB.XPD.RSDV.GD.Z)	96	2011–2015	WB
		*CPIA (Country Policy and Institutional Assessment) policy and institutions for environmental sustainability rating (1=low to 6=high) (WB, 2017, 112 countries, IQ.CPA.ENVR.XQ)	112	2013–2017	WB
4.3 Green employment	*Green jobs *Focus on green projects *Include gender, age, indigenous precedence; informal sector, classification, demands and type of jobs *Greening of all jobs, not just creation of green jobs	*Renewable energy employment by technology (IRENA, 2012–2017, graph)	n/a	2012–2017	IRENA
		*Employment in the renewable energy sector (IRENA, 2012 - 2017, map)	n/a	2012–2017	IRENA
4.3.a Employment (to population ratio)	*Demographic information *Focus on green projects	*Employment-to-population ratio (ILO modelled estimates, 2017, ~200 countries)	200	2017	ILO
		*(Statistics for employment specifically in green projects not found)			

4.3.b Wage and salaried workers	*Formal/informal sources of income *Decent employment *Include occupational health and safety *Focus on green projects	*Informal employment (ILO, 2016, 40 countries)	40	2012–2016	ILO
		*Registered workplaces that could be selected for labor inspection (ILO, safety and health at work, 2005–2017 depends on country, ~50 countries)	50	2012–2017	ILO
		*(Statistics for employment specifically in green projects not found)			
5. Social Inclusion					
5.1 Access to basic services	*Basic health services *Access to basic services of indigenous peoples *Transportation and roads, indigenous people, gender and age, access to health, index of mortality *Health services and access to proper housing *Community awareness and engagement *Number of public events, public participation, public consultation activities, health care, human rights, green education programs *Transportation modes rather than no of vehicles *WI-FI coverage rather than the mobile subscription *Education, stormwater, and& health	*SDG 3.c.1. Health worker density, by type of occupation (SDG, 2012–2016 depends on country, ~200 countries)	200	2012–2016	SDG
		*Health care (% of population with access) (WB, no data in this indicator,SH.STA.ACCH.ZS)	n/a	n/a	WB
		*Coverage of social safety net programs (% of population) (WB, 38 countries, 2017, per_sa_allsa.cov_pop_tot)	38	2012–2017	WB
		*Proportion of population covered by at least a 3G mobile network (WB, 2015, 199 countries, IT_MOB_3GNTWK)	199	2016	WB
		*SDG9.1.2: Passenger and freight volumes, by mode of transport (SDG, 2016, ~200 countries)	200	2016	SDG
		*Participation and human rights (WB, Africa ~60 countries, 2011, MO.INDEX.PHR.XQ, Measures 3 indicators (a) Participation (b) Rights and (c) gender.)	Africa 58	2007–2011	WB
		*Universal Human Rights Index (documents, UN OHCHR.org)	n/a	n/a	UN OHCHR
		*Minority and Indigenous Trends 2018 (reports, Minority Rights Group International, 2018)	n/a	2018	MRGI
		*The Peoples Under Threat ranking (Minority Rights Group International, ~60 countries, 2018)	60	2014–2018	MRGI
		*Rural poverty (2014, The Indigenous Peoples Assistance Facility is an innovative funding instrument for indigenous communities)	65	2010–2014	IFAD
5.1.a Access to drinking water	*Quality of water *Time spend to fetch water *Health and welfare *Transport	*Disability-adjusted life years (DALYs) due to unsafe water source (IHME, 2016, 192 countries) (already used in GGPM)	192	2016	IHME
		*Population affected by water-related disease (FAO Aquastat, 2012, 13 countries)	13	2007, 2012	Aquastat
		*Health care (% of population with access) (WB, no data in this indicator,SH.STA.ACCH.ZS)	n/a	n/a	WB
		*Roads, passengers carried (million passenger-km) (WB, Africa 2 countries, 2008, IS.ROD.PSGR.K6)	Africa 2	2008	WB
5.1.b Access to sanitation	*Quality and affordability of sanitation facilities *Health care service *Housing service (energy-efficient house)	*Expenditure on water services (webpage, WHO/UNICEF JMP)	n/a	n/a	WHO / UNICEF JMP
		*Health care (% of population with access) (WB, no data in this indicator,SH.STA.ACCH.ZS)	n/a	n/a	WB
		*Problems in accessing health care (distance to health facility) (% of women): Q3 (WB, 2017, 13 countries, SH.ACS.DIST.Q3.ZS)	13	2012–2017	WB
		*Coverage of social safety net programs (% of population) (WB, 38 countries, 2012, per_sa_allsa.cov_pop_tot)	38	2012–2017	WB
		*Social health protection coverage as a percent of total population (%) (ILO, 2001–2011 depends on country, 156 countries)	156	2001–2011	ILO
5.1.c Access to electricity	*Proportion using renewable energy sources for electricity *Sources of energy for electricity *Gap to energy access to sustainable energy	*Electricity mix: The breakdown of different fuels used to generate electricity. (IEA, 2015, ~170 countries)	170	2015	IEA

5.1.d Human Capital Index	*Literacy rate *Vulnerability Index to cover the underserved community *Break into percentage of population with basic education level	*Literacy rate, adult total, (% of people ages 15 and above) (WB, 2016, 81 countries, SE.ADT.LITR.ZS)	81	2011–2016	WB
		*School enrollment, primary (% net) (WB, 2016, 142 countries, SE.PRM.NENR)	142	2011–2016	WB
		*Participation and human rights (WB, Africa 58 countries, 2011, MO.INDEX.PHR.XQ, measures 3 indicators (a) participation (b) rights and (c) gender.)	Africa 58	2007–2011	WB
		*Universal Human Rights Index (documents rather than quantitative data, UN OHCHR.org)	n/a	n/a	UN OHCHR
		*Minority and Indigenous Trends 2018 (reports, Minority Rights Group International, 2018)	n/a	2018	MRGI
		*The Peoples Under Threat ranking (Minority Rights Group International, ~60 countries, 2018)	60	2018	MRGI
		*Rural poverty (2014, The Indigenous Peoples Assistance Facility is an innovative funding instrument for indigenous communities)	n/a	2014	IFAD
5.1.e Access to education	-	-	-	-	-
5.2 Access to capital/ resources	*Property rights of indigenous peoples *Percentage of economically active population per education level (Human Capital Index) *Access to financial services *Unemployment rate *Include gender, people, age *PSA payments (gender approach) * Fuels of any kinds	*Percent of Indigenous and Community Lands Ranking (The Land Portal, 64 countries, 2015)	64	2015	FAO
		*Perceived tenure security: percentage of respondents feeling insecure (The Land Portal, 2017, 71 countries)	71	2017	FAO
		*Employment by education (ILO, 2017, 231 countries)	231	2012–2017	ILO
		*The Global Findex database (WB Global Findex, 2017, 166 countries)	166	2014, 2017	WB
		*Unemployment rate by sex, age, and education (%) (ILO, 2017, 75 countries)	75	2012–2017	ILO
5.2.a Prevalence of undernourishment	*Occurrence of droughts *Hunger gaps *Available technology for Climate-smart agriculture (CSA) *Access to agricultural input *Available reserve food and seed system	*Disaster type (EMDAT, 142 countries, 2018)	142	2012–2018	EMDAT
		*SDG 2.1.2: Prevalence of moderate or severe food insecurity in the adult population (%) AG_PRD_FIESMSI (SDG, 2015, 104 countries)	104	2015	SDG
		*Global Hunger Index (GHI) (The Land Portal, 1992, 94 countries)	94	1992	FAO
		*CSA country profiles (29 country reports, CGIAR)	29	n/a	CIGAR
		*Consumption of fertilizers (FAO, 2002, 185 countries)	185	1998–2002	FAO
		*Suite of Food Security Indicators (FAO, 2017, 183 countries)	183	2017	FAO
5.2.b Access to clean fuels	*Separate data for urban/ rural *Availability of technology *Access to clean cooking stoves *Affordability of clean cooking stoves	*Can be estimated (WB, 264 countries, EG.CFT.ACCS.ZS, 2016, SP.RUR.TOTL.ZS, 2017, SP.URB.TOTL, 2017)	264	2012–2017	WB
		*SDG Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all SDG 7.1.2: Proportion of population with primary reliance on clean fuels and technology (%) EG_EGY_CLEAN	200	2015, 2016	SDG
		*(Specific data for clean stove by countries not found)			
5.2.c Inequality-adjusted income	*Formal and informal sectors *Generation of green employment *Prevalence of undernourishment	*Informal employment (ILO, 2016, 40 countries)	40	2011–2016	ILO
		*(Breakdown of wages data by formal/informal employment not found)	n/a	n/a	n/a
		*(Data for average income specifically under green employment by country not found)	n/a	n/a	n/a
5.2.d Registering property	*Land tenure systems *Land and other properties *Taking gender into account	*Land tenure insecurity (WB, 2012, ~30 countries)	30	2012	WB
		*Land ownership (The Land Portal, 2016, 92 countries)	92	2016	FAO
		*Start-up procedures to register a business, male (number) (WB, 2017, 235 countries, IC.REG.PROC.MA)	235	2017	WB
		*Start-up procedures to register a business, female (number) (WB, 2017, 235 countries, IC.REG.PROC.FE)	235	2017	WB

5.3 Gender equality	*Broaden to social equality *Percentage of woman per education level *Indigenous people, age, gender *Equality in education	*The GINI index (WB, 2016, 28 countries, SI.POV.GINI)	28	2016	WB
		*SDG 4.5.1: Gender parity index for achievement in reading, by education level (ratio) SE_GPI_REAACH (SDG, 2000-–015, 121 countries)	121	2000–2015	SDG
		*SDG 4.5.1: Native parity index for achievement in reading, by education level (ratio) SE_NAP_ACHIRE (SDG, 2000–2015, 78 countries)	78	2000–2015	SDG
		*SDG 4.5.1: Rural to urban parity index for achievement in reading, by education level (ratio) SE_URP_REAACH (SDG, 2000–2015, 117 countries)	117	2000–2015	SDG
		*(Webpage) Promising Practices in Supporting Success for Indigenous Students (OECD)	n/a	n/a	OECD
5.3.a Gender Inequality Index	*Proportion of labor force *Urban/rural *Literacy rate	*Employment by sex, age and rural urban areas (thousands) (ILO, 2005–2017, ~150 countries)	150	2005–2017	ILO
		*Literacy rate, male/female (WB, 2016, 81 countries, SE.ADT.LITR.FE.ZS, SE.ADT.LITR.MA.ZS)	81	2011–2016	WB
5.3.b Accessing institutions	*Gender wage gaps *Inequity in earning or wage *Decision-making rates for women *Number of women in parliament/seats/government offices	*Gender wage gap by occupation (%) (ILO, 2005-2017, 35 countries)	35	2005–2017	ILO
		*Women participating in making major household purchase decisions (% of women age 15–49) (WB, 2014, ~10 countries, SG.DMK.PRCH.FN.ZS)	10	2014	WB
		*Women participating in the three decisions (own health care, major household purchases, and visiting family) (% of women age 15–49) (WB, 2014, ~10 countries, SG.DMK.ALLD.FN.ZS)	10	2014	WB
		*SDG 5.5.1; Proportion of seats held by women in national parliaments (% of total number of seats) SG_GEN_PARL (SDG, 2018, ~200 countries)	200	2014–2018	SDG
5.3.c Vulnerable employment, female	*Family support services (e.g., day care). *Disability *Lower cast	*Coverage of social insurance programs (% of population) (WB, 37 countries, 2012, per_si_allsi.cov_pop_tot)	37	2012–2017	WB
		*SDG 8.5.1; Average hourly earnings of managers (ISCO-08) (local currency) SL_EMP_AEARN (SDG, 54 countries, 2014)	54	2010–2014	SDG
		*SDG 8.5.2: Unemployment rate, by sex and age (%) SL_TLF_UEM (SDG, 101 countries, 2015)	101	2011–2015	SDG

***Definition of acronyms on this Appendix Table:**

BIP	Biodiversity Indicators Partnership
CGIAR	Consultative Group for International Agricultural Research
INSEAD,	Institut Européen d'Administration des Affaires
WIPO	World Intellectual Property Organization
EDGAR	Emissions Database for Global Atmospheric Research
EMDAT	Emergency Events Database
FAO	Food and Agriculture Organization
GD-PAME	Global Database on Protected Area Management Effectiveness
IEA	International Energy Agency
IFAD	International Fund for Agricultural Development
IHME	The Institute for Health Metrics and Evaluation
ILO	International Labour Organization
IRENA	International Renewable Energy Agency
ISO	International Organization for Standardization
ITUC	International Trade Union Confederation
IUCN	International Union for Conservation of Nature
IUCN-GISD	International Union for Conservation of Nature - Global Invasive Species Database
MRGI	Minority Rights Group International
ND-GAIN	Notre Dame Global Adaptation Initiative
OECD	Organisation for Economic Co-operation and Development
POPs GMP	Persistent Organic Pollutants Global Monitoring Plan
RISE	Regulator Indicators for Sustainable Energy
SDG	Sustainable Development Goals
UN OHCHR	United Nations Office of the High Commissioner for Human Rights
UN Habitat	United Nations Human Settlements Programme
UN MDGI	United Nations Millennium Development Goals Indicators
UNEP-WCMC	United Nations Environment Programme - World Conservation Monitoring Centre
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
YALE-EPI	Yale Environmental Performance Index
WEF	World Economic Forum
WB	World Bank
WHO / UNICEF JMP	The World Health Organization and United Nations Children's Fund (WHO/UNICEF) Joint Monitoring Programme
WB IDA	World Bank International Development Association
WRI	World Resources Institute

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