Green Growth Potential Assessment

Synthesis Report

GGGI Technical Report #3, December 2018

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List of Abbreviations

AHP	Analytic Hierarchy Process
ANA	Autoridad Nacional del Agua, Peru
CNC	Consejo Nacional de la Competitividad, Peru
CPFs	Country Planning Frameworks
FAO	Food and Agricultural Organization of the United Nations
GCF	Green Climate Fund
GDP	Gross Domestic Product
GGGI	Global Green Growth Institute
GGKP	Green Growth Knowledge Platform
GGPA	Green Growth Potential Assessment
IEA	International Energy Agency
IRENA	International Renewable Energy Agency
MCDM	Multi-Criteria Decision-Making
NDCs	Nationally Determined Contributions
OECD	Organisation of Economic Co-operation and Development
PES	Payment for Ecosystem Services
PRODUCE	Ministry of Production, Peru
SDGs	Sustainable Development Goals
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

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Executive Summary

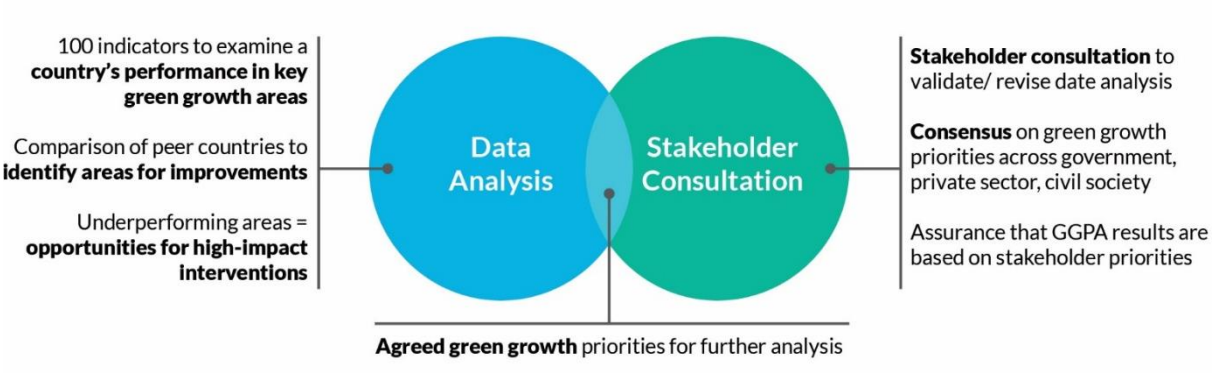
The Green Growth Potential Assessment (GGPA) is a diagnostic tool that combines data analysis and stakeholder consultation. Its purpose is to identify and prioritize a country's opportunities for green growth as well as to develop specific recommendations for each of the identified priorities. During the past three years, the assessment process has been successfully concluded in seven countries: Cambodia, Colombia, Lao PDR, Mozambique, Myanmar, Nepal, and Peru.

This report summarizes the experiences in each country and discusses the lessons learned during that period. It demonstrates that, given the broad nature of green growth as a concept, the GGPA has proven to be a useful tool in helping policymakers identify and address priorities through interventions tailored to their country's context. The experience has shown that governments appreciate the systematic, objective, and participatory nature of the assessment process as much as the analytical insights it delivers.

1.Introduction

The Green Growth Potential Assessment (GGPA) is a diagnostic tool that combines data analysis and stakeholder consultation (see 0). The methodology was developed by the Global Green Growth Institute (GGGI) for several purposes. First, the GGPA provides governments with policy advice based on empirical analysis, determining the priorities for potential green growth interventions. Second, the GGPA gives recommendations of how to address the identified priorities, which are tailored to an individual country's context. Third, the GGPA can also serve governments to translate international commitments, such as the United Nations' Sustainable Development Goals (SDGs) or the Nationally Determined Contributions (NDCs) as part of the Paris Agreement on Climate Change, into local action. Fourth, the assessment helps GGGI identify areas in which the organization will focus its work, identifying options for specific programs and projects in a given country. Finally, the GGPA serves as a communications and engagement tool. The assessment process and its results help foster interest in partner countries to engage further with GGGI.

Figure 1. Conceptual Schematic of the GGPA Process



Source: Global Green Growth Institute

During the past three years, the GGPA methodology has been successfully applied in Cambodia, Colombia, Lao PDR, Mozambique, Myanmar, Nepal, and Peru, with experiences indicating that the assessment process and the resulting analytical insights are highly valued by government partners. Past assessments have also demonstrated the value of the GGPA process and the usefulness of its results. However, during that period, GGGI has also learned valuable lessons to strengthen the assessment process and further increase the relevance of the results. These lessons involve conceptual changes of how the GGPA is conducted (e.g., the analytical framework) as well as technical changes to the assessment methodology (e.g., the set of indicators used for the preliminary assessment).

This report answers several crucial questions to understand the value of the GGPA methodology to partner countries and GGGI, the analytical process, and the lessons learned from having successfully conducted seven individual assessments.

2.Why Conduct a GGPA?

GGGI defines green growth as a development approach that seeks to deliver economic growth that is both environmentally sustainable and socially inclusive. Through the green growth model, countries seek opportunities for economic growth that are low-carbon and climate resilient, prevent or remediate pollution, and maintain healthy and productive ecosystems as well as create green jobs, reduce poverty, and enhance social inclusion. Several definitions and concepts of green growth exist in different development organizations, such as the OECD, UNEP, and the World Bank. Common to all these definitions is that green growth balances economic growth, environmental sustainability, and social inclusion, aiming to minimize the tradeoffs and maximize the synergies between them.

In the past, economic growth often came at the expense of unsustainably using natural assets with negative impacts on the environment, leading to the harmful pollution of air, water, and soils; the loss of biodiversity; and climate change. A growing population and rapid urbanization accentuate these trends and further increase the need for a sustainable growth model. Green growth recognizes that many of the negative consequences of air pollution, environmental degradation, unsafe water, and climate change disproportionately impact poorer groups within the society. Ultimately, green growth is a means to reduce poverty, mitigate climate change and strengthen resilience against its unavoidable impacts, support environmental protection, and use resources more efficiently.

The entering into force of the Paris Agreement in November 2016, its ratification by 178 parties of the UN Framework Convention on Climate Change (UNFCCC 2018), and the unanimous adoption of the Sustainable Development Goals (SDGs) by all 193 UN members (UN 2015a, UN 2015b) are evidence that awareness of and commitment to green growth are rising worldwide. Green growth is increasingly being integrated into national development plans, sectoral strategies, and other policies as a means of simultaneously achieving economic growth and social and environmental goals. However, as is evident from the definition above, green growth is a broad concept, encompassing not only different economic sectors but also different levels of intervention. Furthermore, what green growth means in individual countries and how it can be translated into specific actions depends on a wide range of factors, such as a given economy's stage of development, its endowment with natural assets, and its social characteristics. Given the concept's broad nature, there is a need to clarify what green growth means in a specific country's context, identify priorities, and assess those priorities systematically.

The past three years have demonstrated the value of the Green Growth Potential Assessment in this respect. The GGPA has proven to be a useful tool, providing policymakers with empirically-founded advice and helping them to determine areas where green growth interventions can have the highest impact. Furthermore, the GGPA gives recommendations regarding the means and actions to address those priorities, which are tailored to an individual country's context. In addition, the GGPA can also serve governments to translate international commitments, such as the SDGs or the Nationally Determined Contributions (NDCs), into local action. With its thorough technical analysis, the findings of the GGPA can also support in attracting donor funding or private sector investment. For example, findings from the assessment process may prove highly relevant in undergirding the rationale for Green Climate Fund (GCF) Readiness Proposals. The experience has shown that governments appreciate the systematic, objective, and participatory nature of the assessment process as much as the analytical insights it delivers.

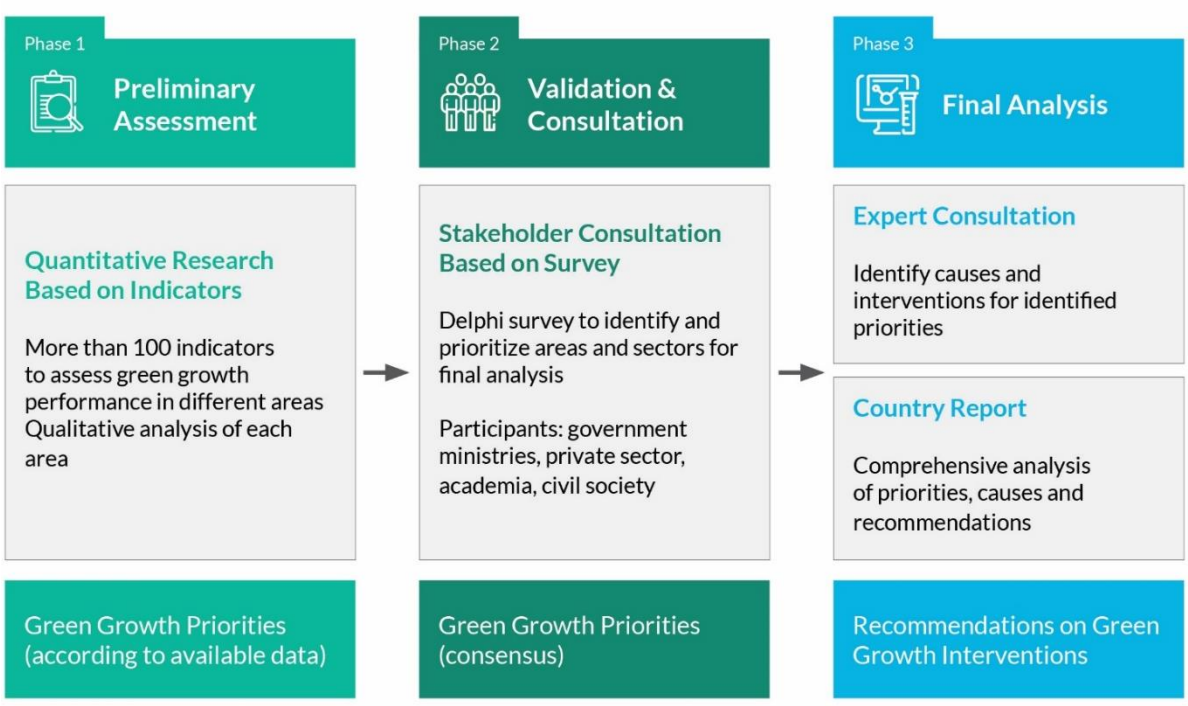
Beyond supporting government partners, the GGPA also serves GGGI itself for different purposes. First, the tool helps GGGI to identify areas in which the organization will focus its work, highlighting options for specific programs and projects that are technically feasible and enjoy political support in a given country. In that way, the assessment supports GGGI's entire value chain, using the results of the GGPA

to catalyze tangible actions in the form of policy reforms, changes in regulations, and specific infrastructure projects, all grounded on the assessment's recommendations. Second, the GGPA serves as a communication and engagement tool. The assessment process and its results are helpful to foster interest in partner countries to engage further with GGGI. Conducting an assessment is often one of the initial steps when GGGI is engaging with a new country, and the final report is, in many cases, the first service GGGI delivers to a partner country. Consequently, the quality of the assessment and the usefulness of its results contribute to convince partner countries of the benefits that GGGI has to offer as well as the quality of the organization's services.

3.How Is a GGPA Conducted?

The GGPA is a diagnostic tool that combines data analysis and stakeholder consultation. Its purpose is to identify and prioritize a country's opportunities for green growth as well as to develop specific recommendations for each of the identified priorities. The assessment process consists of the following three stages: (1) a preliminary assessment based on quantitative data analysis, (2) a validation of the preliminary assessment and consultation with stakeholders, and (3) a final assessment that includes the development of recommendations (0). This design ensures that the assessment process is systematic, objective, and participatory.

Figure 2. Overview of the GGPA Process



Source: Global Green Growth Institute

During the past three years, the GGPA methodology has been successfully concluded in seven countries: Cambodia, Colombia, Lao PDR, Mozambique, Myanmar, Nepal, and Peru.[1] Working closely with government counterparts, conducting a complete GGPA takes up to one year, as GGGI generally

[1] Technical reports for all countries can be accessed online. See GGGI 2016; GGGI 2017a; GGGI 2017c; GGGI 2017e; GGGI 2018a; GGGI 2018c. In addition, summary reports can be accessed for the following three countries: Cambodia (GGGI 2018b), Lao PDR (GGGI 2017b), and Myanmar (GGGI 2017d).

conducts assessments in several countries in parallel.[2] In the process, GGGI consults with about fifty (e.g., Laos, Nepal) to up to one hundred stakeholders (e.g., Cambodia) in the country, identifying four to five priorities for green growth (table 1). The final report suggests a set of recommendations for each of those priorities, supported by analysis based on existing research, case studies, project evaluations, relevant examples from other countries, and existing policies.

Table 1. GGPAs Conducted (2016–2018)

Country	Time Frame	Government Counterpart	Stakeholders Consulted	Priorities Identified
Peru	November 2015–June 2016	Ministry of Environment	Academia and research (1) Government (32) Private sector (5)	Agriculture Energy Forestry Mining Water supply and quality
Colombia	January–December 2016	National Planning Department	Academia and research (10) Development partners (25) Government (57) Private sector (12)	Agriculture, forestry, and land use Natural capital management Renewable energy Water supply and quality
Nepal	July 2016–July 2017	Ministry of Population and Environment	Academia and research (6) Government (36) Private sector (4)	Agriculture Forestry and land use Renewable energy Water supply and quality
Lao PDR	November 2016–November 2017	National Institute of Economic Research	Academia and research (15) Government (40) Legislative (4)	Agriculture Education Energy and mineral resources Forestry and land use Tourism Urban development and transport
Myanmar	October 2016–December 2017	Ministry of Natural Resources and Environmental Conservation	Development partners (18) Government (36) Legislative (3)	Agriculture, forestry, and land use Education and good governance Energy Industry, mining, and tourism
Cambodia	June 2017–May 2018	National Council for Sustainable Development	Government (70) Development partners (33)	Agriculture Natural capital management Renewable energy Industry
Mozambique	June 2017–May 2018	Ministry of Land, Environment and Rural Development	Academia and research (2) Government (22) Development partners (6)	Agriculture Education and good governance Forestry and land use Renewable energy

Source: GGGI

[2] Considering the effective work hours needed to conduct a single GGPA, a full assessment can be conducted in approximately four months. However, GGGI generally conducts two to three GGPAs in different countries in parallel.

The experiences gained in these countries provided valuable lessons and triggered numerous revisions to the assessment methodology. This chapter provides an overview of the methodology, including some of the major changes that have been made to the assessment process. These revisions encompass a large range of technical changes to the analytical methodology, such as the set of indicators for the preliminary assessment, design of the consultation workshop, and structure and design of the final report. Beyond that, the individual assessments led to several conceptual changes of how the GGPA is conducted; for example, the analytical framework used for the preliminary assessments as well as the development of a more rapid assessment methodology that can be applied in countries where a full-fledged GGPA is not needed.[3] The following sections highlight the experiences and lessons learned for each of the GGPA's three stages, illustrated by examples from the seven countries where the GGPA has been conducted so far.

3.1 Preliminary Assessment

The first stage of the GGPA process consists of a quantitative assessment based on a set of indicators relevant for green growth. The GGPA draws on a set of more than one hundred comparative indicators covering the economic, environmental, and social dimensions of green growth. The methodological framework and indicators for measuring green growth as part of the GGPA are in line with the theoretical work undertaken by other institutions in this area. In order to measure green growth, the Green Growth Knowledge Platform (GGKP) proposes to examine indicators reflecting the following five dimensions: (1) natural assets, (2) resource efficiency, (3) (climate) risk and resilience, (4) economic growth and innovation, and (5) social inclusion (GGKP 2013, GGKP 2016). The GGPA is largely following this approach (figure 3). To the extent possible, indicators reflecting the dimension of economic growth and innovation have been included in other dimensions.[4]

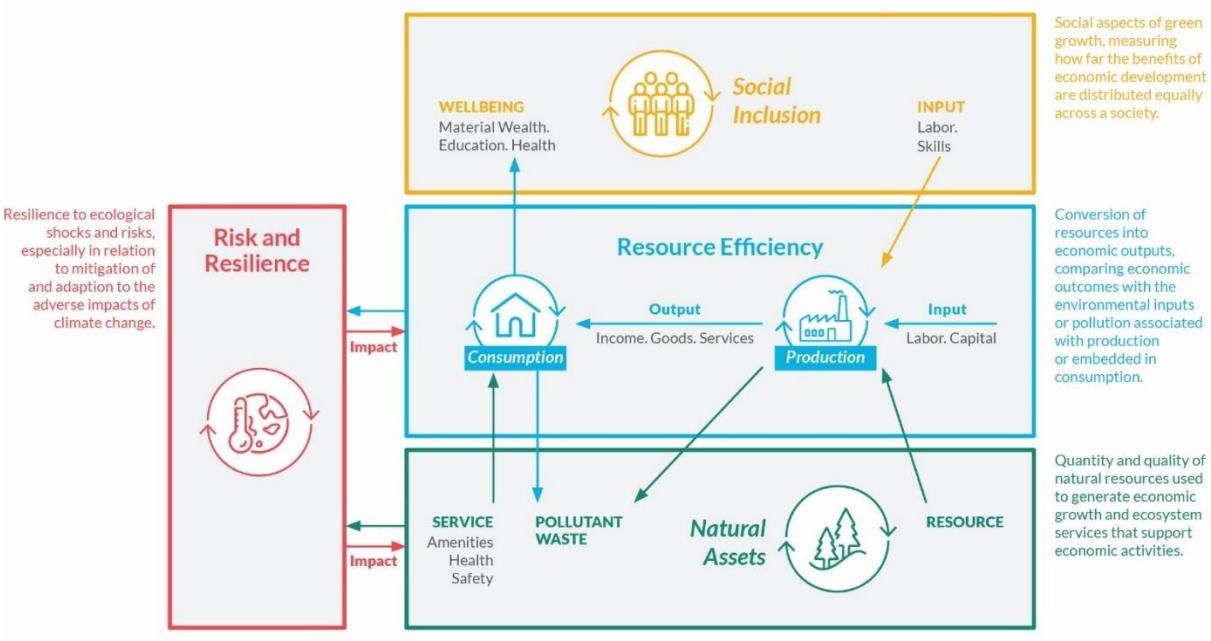
Each indicator represents an area relevant to green growth that includes more than the corresponding data point captured by the individual indicator. For example, the indicator *electricity losses* is used as a proxy to measure the efficiency and reliability of the electricity system overall. Following the *OECD Handbook on Constructing Composite Indicators* (2008), indicators for the GGPA were selected and continue to be refined based on the following criteria:

- Relevance for determining green growth priorities
- Analytical insight and conceptual soundness
- Data availability
- Data quality

[3] For more detailed information on these revisions, please refer to the upcoming methodology report.

[4] There are several reasons for not assessing the dimension of economic growth and innovation separately in the GGPA framework. First, availability of relevant data is very limited. Second, indicators suggested by GGKP (2016) to measure economic opportunities largely reflect policy measures, asking whether or not these measures are in place. However, it is challenging to capture the effectiveness of policies systematically for comparative analysis. Third, indicators (e.g., green jobs, green investment, etc.) lack agreed definitions, which undermines the results of any peer comparisons and renders them unsuitable for the purpose of the preliminary assessment. Finally, many of the proposed measures better suit the context of developed countries whereas GGGI is largely working in developing countries. For example, measuring R&D expenditure is likely of limited relevance. Developing countries mostly profit from R&D investment undertaken and patents developed elsewhere, as they lack the resources to lead such developments themselves.

Figure 3. GGPA Framework



Source: Global Green Growth Institute

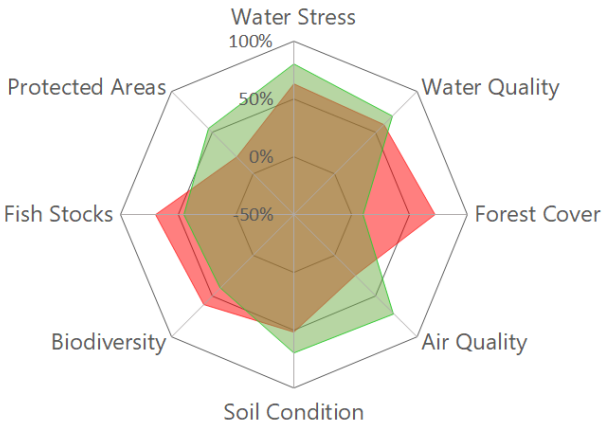
All indicators are normalized to make a country's performance comparable across different indicators. A country's performance on each indicator is then benchmarked against a group of peer countries that were agreed on by stakeholders. These comparisons are illustrated in four distinct radar charts (one for each green growth dimension) to introduce the results and facilitate discussion with stakeholders (figure 4).

The preliminary analysis serves as a starting point for identifying the priority areas for green growth, causes for low performance in specific areas, and possible remedies. Emphasis rests on areas that show comparatively lower scores, as these can represent a higher potential for improvement at moderate costs.

The set of indicators has been revised and considerably extended over the past three years.[5] Two of the major revisions were (1) adding social inclusion as a green growth dimension to the analytical framework and (2) representing an area relevant to green growth by more than one indicator.

First, the initial framework of the GGPA considered three aspects of green growth: efficient use of resources, conservation of

Figure 4. Schematic of Radar Chart for Natural Assets



Source: Global Green Growth Institute

[5] For a detailed discussion of the changes to the indicators, please refer to the technical report.

natural assets, and climate change. Based on the experiences during the assessments of Lao PDR and Nepal, as well as to align the GGPA framework more closely with the concept suggested by the GGKP and GGGI's definition of green growth, social inclusion was added as a fourth dimension.

Second, as mentioned above, in the country score cards, each of the illustrated indicators represents an area relevant to green growth. Representing an area by a single data point has proven insufficient due to low data quality, lack of methodological soundness, or both. As a result, the set of indicators has been expanded considerably, to allow for more granularity in the analysis. The additional indicators complement the existing data set and strengthen the analysis, by adding analytical depth, corroborating or questioning the initial results, and providing causal explanations for the observed performance. The additional indicators also align the GGPA indicators closer to GGGI's Green Growth Index as well as the indicators used to measure progress on the Sustainable Development Goals. While the country scorecards continue to depict performance in selected areas based on a single indicator, the underlying analysis is informed by a much larger data set, allowing for a more solid and nuanced discussion of the scorecard results.[6]

3.2 Validation and Consultation

The GGPA engages stakeholders from the government, academic institutions, the private sector, civil society, and development partners. Stakeholder input is essential to identify priorities for green growth and to develop recommendations considering local conditions. While stakeholder engagement occurs throughout the entire assessment process, a concerted effort to systematically gather feedback from a broad range of constituents is made following the preliminary assessment through an interactive workshop. This workshop serves for stakeholders to select green growth priorities, confirming or adjusting the results of the preliminary assessment.

Consultation Process

For that purpose, during the workshop, stakeholders are asked multiple times via an electronic survey system to select priorities for green growth, based on a list of preselected areas represented by the indicators used during the preliminary assessment. Each consultation round is informed by relevant results from the preliminary assessment. After each consultation round, the results are shared with participants to inform the discussion. The survey system allows participants to voice their opinion anonymously, without interference of status, age, or sex of other participants. This also allows for the gathering of feedback on politically sensitive issues that some participants might be unwilling to openly share their views on. Discussing the results after each survey round allows them to adjust their assessment based on additional information and feedback within the group.

This process is based on the Delphi method, which is a systematic, interactive, and multiple-stage survey methodology, relying on a panel of experts. It was originally developed to systematically gather expert opinions and evaluate events and trends, based on consent or dissent among participants (Turoff and Linstone 2002; Vorgrimler 2003; Okoli and Pawlowski 2004).

[6] For example, energy consumption continues to be represented by measuring the energy intensity of a country's economy in terms of kilojoule per GDP. However, in addition, the extended set of indicators includes measures for energy intensity in the industry sector; energy intensity of road passenger transport; share of primary, secondary, and tertiary sector in the national economy; energy consumption per capita; total primary energy supply by fuel; total final consumption by fuel and by sector; net imports share by fuel; and share of population with access to electricity.

Presenting the results of the data analysis, coupled with a systematic participatory process, is essential to ensure broad stakeholder consensus on green growth priorities. The consultation process also serves to validate and/or revise the initial findings, partly compensates for the lack of relevant data, and ensures the alignment of GGPA results with existing policies. The analysis and recommendations in the country report specifically address the selected priorities. The rationale behind employing such an inclusive method is to give stakeholders a leading role in the content and scope of the assessment, making it relevant to their needs.

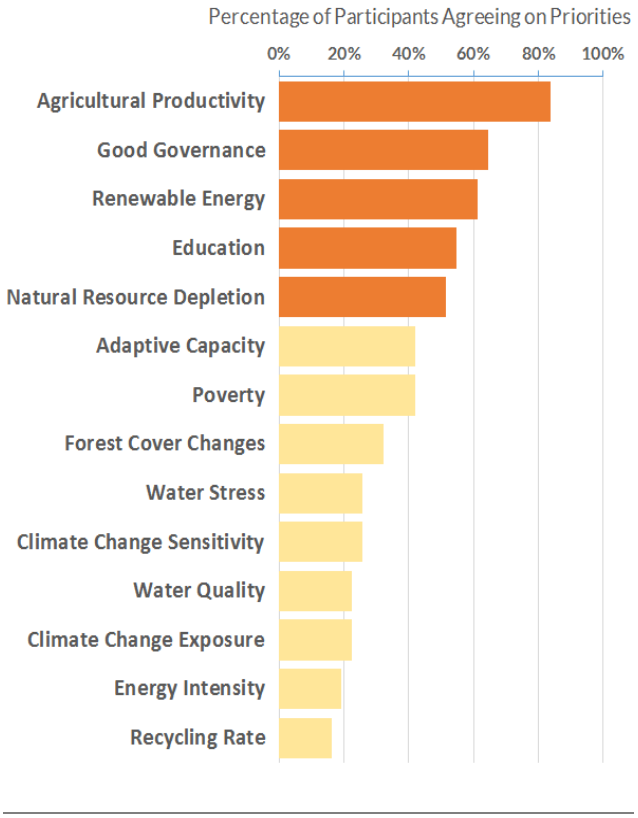
The consultation workshop generally takes participants through the following steps:

First, the results of the preliminary assessment are introduced separately for each of the four green growth dimensions (see figure 3, page 15). Participants are asked for their initial feedback on the results of the preliminary assessment, presented in the form of radar charts, and to select priorities separately for each dimension.

Second, this is followed by a second round of feedback in which participants can select priorities across all four dimensions.

Third, the plenary discusses the selected priorities as well as results that figured prominently in the preliminary assessment. This discussion is supported by presenting the audience with a more detailed analysis on the selected areas, based on the indicators and results of the literature review, going beyond the standard set of indicators. Participants are then asked for a third time to select priorities in order to confirm or revise the earlier results (figure 5).

Figure 5. Example of Selected Priority Areas



Source: Global Green Growth Institute

Three consultation rounds have proven to be sufficient to build consensus around priorities. This is based on two observations from past workshops. First, the concentration of votes captured by the top five priorities increased throughout the feedback rounds in five of six cases.[7] Second, changes in the top

[7] The only case where the concentration of votes dropped in the course of the workshop was in Mozambique. This was largely due to a very high concentration of votes in the first feedback round, where participants were given a total of four instead of eight votes. This was done to accustom participants with using the electronic voting system used to gather their feedback. However, this made the methodology less reliable and will therefore not be repeated in future workshops.

five priorities selected by participants were considerably larger between the first and second feedback rounds than between the second and third feedback rounds.[8]

In the second part of the workshop, participants are divided into smaller groups. The aim of these breakout groups is to consolidate the results of the plenary survey and define the identified priorities more closely. Past experiences have shown that participants appreciate this interactive session of small group discussions while the results provide additional insights to determine the direction of the final analysis (country report). To make these sessions more relevant, the amount of time dedicated to the group discussions has increased considerably over the course of the past assessments.

To guide the discussion, breakout groups are given two specific tasks. First, they are asked to verify whether the group agrees with the priorities selected by the plenary and to choose alternative priorities in case they do not agree. Second, in order to narrow down priorities, each group is asked to define the priorities more closely. For that purpose, participants are given a list of choices for each priority and asked to identify (1) causes that make the chosen priority a challenge and (2) options than can help to address the challenge. The list of choices is based on the results of the preliminary assessment, literature review, and input from GGGI thematic experts. Beyond these preselected options, participants are encouraged to suggest further issues.

The results from the breakout groups are discussed in the plenary and confirmed through a final survey round. It has proven useful to close the final survey round by asking participants to what extent they agree with the workshop results. This serves as a final check of the validity and representativeness of the results and provides an opportunity for dissenting voices and potential critique towards the methodology to be heard and addressed.

Figure 6. Consultation Process

Consultation Results

The usefulness of the workshop and the validity of its results have been supported by participants' high agreement with the results recorded in past consultation workshops. For instance, in Cambodia, nearly all participants (>95%) agreed or somewhat agreed that the final analysis should focus on the selected

[8] Countries where three feedback rounds were recorded include Cambodia, Mozambique, Myanmar, and Nepal. In Nepal, two of the initial top five priorities were replaced in the second feedback round while no changes occurred during the third feedback round. In Myanmar, three of the initial top five priorities were replaced in the second round, with only one of the top five priorities replaced in the third round. In Cambodia, one of the initial top five priorities was replaced in the second round while an additional priority was added in the third round, due to the fifth and sixth top priorities receiving the same number of participants' votes. In Mozambique, one priority was added in the second round due to the tie of votes. A different priority was dropped in the third round.

priorities. In Mozambique, nearly 70% of participants agreed with the results, more than 20% somewhat agreed, and only 10% disagreed.[9]

The consultation workshop is an essential part of the GGPA. The priority areas identified by stakeholders determine the scope and direction of the country report, with the report's analysis and recommendations addressing the priorities selected during the workshop. Table 2 provides an overview of the priorities identified in six of the seven countries where a GGPA has been conducted.[10] Several green growth priorities figure prominently across most countries assessed so far. For example, off-grid electrification and the deployment of renewable energy were selected as priorities in all six countries. Similarly, energy efficiency measures—particularly in the industry sector—enjoy high support among policymakers. All three areas are among GGGI's core competencies, both in terms of project development and mobilizing finance.

In five of six countries, forest conservation and restoration were viewed as a priority. Interestingly, they were regarded as a priority across countries for similar reasons, such as the essential ecosystem services provided by forests and the decisive role forests play in strengthening the adaptive capacity of the agriculture sector to face the adverse impacts of climate change. As with energy, GGGI has a dedicated team responsible for the organization's sustainable landscapes program.

Urban development, transportation, and waste management belonged to the highest priorities in Laos, Myanmar, and, to a lesser extent, Nepal. Particularly in Laos and Nepal, transportation plays a central role in GGGI's work, with the organization supporting both countries with initiatives to promote electric bikes and tuk-tuks.

The tourism sector has received much attention in Laos and Myanmar. Both countries consider tourism as an important driver for economic growth. At the same time, governments in the two countries are loath for the sector to expand to the detriment of the environment. Therefore, recommendations in the final report on ecotourism and the environmentally friendly development of tourism sites and infrastructure, as well as the reinvestment of revenues from the sector into conservation efforts, were welcomed.

Finally, it is noteworthy that the topic of clean cooking came up as a priority for the first time during the most recent country assessment in Mozambique. This shows that, despite following a standardized methodology, the GGPA does not put forward a standardized set of recommendations to each country but offers tailored advice that considers the local context.

[9] In prior GGPAs, participants had not been asked to explicitly provide feedback on this question. However, when discussing the workshop results in Lao PDR, participants only asked for one change to be made in the summary while no changes were asked for in Myanmar.

[10] A comparable breakdown is not available for Colombia, as the workshop only had the objective of determining sectors that were a priority for green growth, without identifying more granular information of specific issues within each sector.

Table 2. Identified Priorities

Sector	Priority	Cambodia	Lao PDR	Mozambique	Myanmar	Nepal	Peru
Agriculture, forestry, and land use	Adaptive capacity	X	X		X	X	X
	Forest conservation	X	X	X	X		X
	Ecosystem services and agroforestry		X	X	X	X	X
	Extension services	X		X	X		
	Illegal logging	X	X	X	X		
	Irrigation	X	X	X		X	X
	Land use planning		X	X	X	X	
Energy	Clean cooking			X			
	Energy efficiency	X	X		X	X	X
	Electricity tariffs	X	X	X	X	X	
	Financing	X		X			
	Long-term planning	X		X	X		X
	Off-grid electricity generation	X	X	X	X	X	X
	Regulation	X		X			
	Renewable energy	X	X	X	X	X	X
Industry	Energy efficiency	X					
	Pollution control	X			X		
	Waste management	X					
Mining	Pollution						X
	Renewable Energy						X
	Transparency		X		X		
	Royalties and distribution of revenues		X		X		X

Table 2. Identified Priorities (continued)

Sector	Priority	Cambodia	Lao PDR	Mozambique	Myanmar	Nepal	Peru
Transportation and urban development	Energy efficiency (buildings)		X		X		
	Financing				X		
	Non-motorized transport		X				
	Public transport		X			X	
	Urban planning		X		X		
Tourism	Urban planning		X		X		
	Expansion of revenue base		X		X		
	Vocational training		X				
	Reinvestment of revenues				X		
Waste management	Recycling		X				
	Solid waste collection		X				
	Waste water treatment				X		
Water	Water management					X	X
	Payment for ecosystem services						X

Source: Global Green Growth Institute

Changes to Methodology

Experiences from past consultation workshops allowed for refining the application of the Delphi survey technique, such as the number of survey rounds, combination of presenting the results of the preliminary assessment and gathering participants' feedback, and design of the group discussions.

For example, in Nepal and Laos, stakeholders challenged the validity and representativeness of some of the indicators, including energy intensity being measured as energy consumption per GDP. In response to these early experiences, the preliminary analysis has been strengthened by widening the base of indicators. As a result, individual areas of green growth are being represented by more than a single indicator. This has strengthened the credibility of the preliminary assessment in the eyes of stakeholders. For example, when discussing the results for energy intensity in Mozambique, the assessment team was

able to draw on a much wider range of indicators than merely referring to energy consumption per GDP.[11]

Similarly, the analysis has been strengthened to reflect imbalances within a country. For example, based on lessons learned in Cambodia, when discussing water stress in Mozambique, the preliminary analysis accounted more properly for geographical distribution, climate patterns (about 90% of rainfall occurring during the period of December to March), and existing infrastructure to manage water supply and distribution (e.g., storage capacity, quality of irrigation, and distribution systems).

Finally, the setup of the group discussion has been refined considerably, with the way the deliberations are structured gradually becoming more flexible. Particular improvements have been applied to the method of determining priorities more closely. Initially, the same preselected set of sectors was used to narrow down the priorities for each green growth area. Experiences in Nepal and Laos showed that this approach was too broad and delivered little additional insight. Since then, several alternatives for determining priorities more closely have been tested. In recent consultations, a tailored list of specific aspects related to each of the potential priorities has proven to offer more flexibility during the discussion and to provide more useful granularity to the identified priorities.

3.3 Final Assessment and Recommendations

Building on the results of the consultation workshop, specific opportunities and barriers to green growth are identified for each of the selected priorities. The final assessment is built around a set of recommendations, ranging from changes in policy to strengthening regulation and enforcement to technical interventions and specific pilot projects. As part of this process, the linkages between the selected priorities are analyzed. Furthermore, existing gaps and inconsistencies in a country's policy framework and its governance procedures are identified.

The recommendations are informed by quantitative and qualitative analysis, based on existing research and publicly available data sets. Furthermore, they are drawn from examples, best practices, results of pilot projects, and policy reforms within the selected country or relevant peers. Finally, a crucial input to analyze challenges and opportunities is a series of expert interviews conducted in the assessment country.

An important lesson from the GGPA of Laos was that the scope and purpose of the recommendations needs to be agreed on by the government partner(s) after identifying the priority areas. While all assessments broadly serve the purpose of identifying green growth priorities and present recommendations on how to address those priorities, it is important to align the nature and scope of the recommendations with the local requirements. This follows GGGI's overarching philosophy to support countries with services across a comprehensive value chain, from diagnosing relevant issues and formulating policies to designing bankable projects, developing investment plans, and facilitating access to international finance.

For example, in Myanmar, Nepal, and Peru, the recommendations were focused on supporting the development of policies, such as incorporating emissions targets into the land use policy of Myanmar,

[11] The additional indicators include energy intensity in the industry sector; energy intensity of road passenger transport; share of primary, secondary, and tertiary sector in the national economy; energy consumption per capita; total primary energy supply by fuel; total final consumption by fuel and by sector; net imports share by fuel; and share of population with access to electricity.

establishing financial incentives for farmers to adopt climate smart agriculture practices in Nepal, and improving taxation and incentive schemes in the mining sector in Peru.

In Cambodia, numerous recommendations provided advice on how to strengthen specific regulations, including monitoring of industrial waste, licensing of solar power equipment for mini-grid operators and commercial end-users, and enhancing the independence of the electricity sector regulator.

Finally, several recommendations in the assessments of Laos, Myanmar, and Mozambique referred to specific infrastructure projects, such as a pilot scheme on low-carbon transport options that includes electric buses, motorcycles, and tuk-tuks in Laos; the construction of a model waste water treatment plant to demonstrate the benefits of existing best practices in industrial waste water treatment in Myanmar; and a pilot project for off-grid solar solutions for productive use in Mozambique.

Box 1. GGPA Light

Given the occasional urgency for both national governments and GGGI to conduct an assessment, there is a need for a reduced version of the GGPA, short of a full-fledged assessment. The scope and format of any such *GGPA light* will depend on the requirements that individual government partners and GGGI have.

For example, the assessment could focus on the results of stakeholder consultation; for instance, identifying green growth priorities, providing options for the areas and questions that would require further assessment in order to agree on specific projects.

Another possibility is that, from its outset, the lighter assessment focuses on one specific area of green growth. This would reduce the scope of both the preliminary assessment and the final assessment while giving the consultation workshop a new role. In this context, the consultation could be geared towards selecting individual interventions in a given area (e.g., in the energy sector, whether to focus on clean cooking solutions or off-grid electricity from renewable sources) instead of selecting overall priorities (e.g., whether green growth interventions should focus on sustainable forestry or the energy sector).

The possibility of conducting such a lighter version of the assessment has already been included in GGGI's service offerings and is currently being tested in Jordan.

4. How Are the GGPA Results Being Used?

Broadly, all assessments serve the purpose to identify green growth priorities and present recommendations on how to address those priorities. It is essential that the analysis and recommendations are tailored to the needs of partner governments. The more the findings address a country's specific requirements, the more useful the results and recommendations of the assessment are for government counterparts and GGGI.

Additionally, partner countries have used the findings of the GGPA and adopted some of its recommendations in different ways. For instance, in Colombia and Peru, the assessment mainly served as an input to developing the country's green growth strategy. However, in Lao PDR and Myanmar, it also provided input to sectoral strategies and helped identify specific projects. In Nepal, the assessment results were primarily used to identify potential pilot projects. In the case of Cambodia, the GGPA served to provide the analysis and rationale for specific interventions to achieve targets set in the national development plan while in Mozambique, the assessment results were used for the widest range of purposes among the seven countries (see table 3).

Table 3. Use of GGPA Results

	Input to National Green Growth Strategy	Input to National Development Plan	Input to Sector Strategies	Input to Regulation and Implementation	Input to GGGI Country Planning Framework	Identification of Pilot Projects
Cambodia		X				X
Colombia	X					
Lao PDR	X		X		X	X
Mozambique		X	X	X	X	X
Myanmar	X		X		X	X
Nepal					X	X
Peru	X					

Source: Global Green Growth Institute

Beyond supporting partner governments, the results of the GGPA generally serve as an important input to GGGI's Country Planning Frameworks (CPFs). The organization develops a CPF when starting its work in a new member country. In that process, the GGPA provides the organization with options for interventions and projects to work on with specific countries. The relevance of the suggested initiatives is supported by the report's technical analysis and the political support they enjoy, confirmed through consulting stakeholders.

The relevance and usefulness of the GGPA is confirmed by partner governments adopting several recommendations and GGGI country teams developing them into project proposals.

Several GGPAs helped governments in drafting their own strategies. For example, the GGPA identified (eco-) tourism, sustainable transport, renewable energy, energy efficiency, and waste management as priorities for green growth in Lao PDR. Consequently, the government decided to mirror these priorities in its country's National Green Growth Strategy. In Myanmar, the GGPA analysis has served as the basis for GGGI's input into the drafting or implementation of the Myanmar Climate Change Strategy and Masterplan (draft), Myanmar Agriculture Development Strategy (2018), National Land Use Policy (2016), National Sustainable Development Plan (2018), and National Green Economy Policy Framework (draft).

Several project ideas that are being developed by GGGI country teams have their origin in the GGPA. For example, the teams in Laos, Mozambique, and Nepal are either developing project proposals (Laos, Nepal) or implementing pilot projects (Mozambique) based on opportunities highlighted in the GGPA report (table 4).

Table 4. Relevance of GGPA Results

Country	Category	Recommendation adopted by partner government
Cambodia	Input to National Development Plan	Promotion of energy efficiency measures in the industry, recognizing that it represents one of the highest return and lowest risk investments.
Colombia	Input to National Green Growth Strategy	Identification of agriculture, forestry, and land use; natural capital management; renewable energy; and water supply and quality as priorities for green growth.
Lao PDR	Input to National Green Growth Strategy	Identification of (eco-) tourism, sustainable transport, renewable energy, and waste management as priorities for green growth.
	Input to Sector Strategies	Recommendations to urban development strategy, solid waste management strategy for Vientiane, and national urban sanitation strategy.
	Identification of Pilot Projects	Promotion of electric vehicles, including electric bikes and tuk-tuks, and solid waste & wastewater management in Vientiane and Pakse.
Mozambique	Identification of Pilot Projects	Pilot project for an off-grid solar system for productive use of electricity in the agriculture sector.
Myanmar	Input to Regulation and Implementation	Input into drafting or implementation of the Myanmar Climate Change Strategy and Masterplan (draft), Myanmar Agriculture Development Strategy (2018), National Land Use Policy (2016), National Sustainable Development Plan (2018), and National Green Economy Policy Framework (draft).
Nepal	Identification of Pilot Projects	Project proposal for decentralized wastewater treatment facilities in secondary cities or small towns. Investigation of commercial forestry opportunities, with carbon credit connections for operational expenses and opportunities for non-timber products.
Peru	Input to National Green Growth Strategy	Promotion of certification schemes for sustainable forestry products, upscaling bio trade programs, mainstreaming natural capital accounting, and development of Payment for Ecosystem Services (PES).

Source: Global Green Growth Institute

5. How Does the GGPA Compare to Other Assessments?

Several organizations conduct assessments similar to the GGPA. For example, the IEA, OECD, and World Bank conduct country assessments, with the difference being that the scope of these assessments (i.e., the sectors, areas, and topics to be looked at) are the same for each country, and stakeholder consultation is limited to inform the technical analysis.

The GGPA is comparable to IRENA's Renewables Readiness Assessment in how it combines data analysis with stakeholder consultation and in-depth analysis. An important distinction between the two assessment methodologies lies in the sequence of the different activities. The GGPA consults with stakeholders in order to identify the direction and scope of the final report prior to its drafting while stakeholder consultation as part of IRENA's assessment process serves to validate and revise the findings of the final report after it has been drafted (IRENA 2013).

Similarly, the GGPA shares a number of features with the FAO's Rapid Rural Appraisal. Both combine a range of analytical procedures, including semi-structured expert and group interviews, methods of cross-checking information from different sources, sampling techniques that can be adapted to a particular objective, methods of obtaining quantitative data in a short time frame, methods of direct observation at site level, and use of secondary data sources. Both approaches reflect an attempt to gain relevant research insights within a short period of time for the purpose of project planning, and both can be conducted at comparatively low costs. In essence, the two methodologies represent a bridge between formal surveys and unstructured research methods (FAO 1997).

The GGPA's preliminary assessment with its reliance on standardized data analysis is comparable to a number of tools that focus on the quantitative analysis of green growth with the aim to benchmark countries. Examples include the use of dashboard indicators (e.g., OECD Green Growth Indicators, Eurostat's Sustainable Development Indicators), composite indices (e.g., Yale University's Environmental Performance Index, GGGI's Green Growth Index), environmental footprints (e.g., UNEP's Carbon Footprint, Global Resource Footprint of Nations), and adjusted economic indicators (e.g., World Bank's adjusted net savings, OECD's environmentally adjusted multifactor productivity). The GGPA shares the element of comparing countries' performances based on data analysis. However, since the GGPA focuses on a single country at a time, the standardized benchmarking process is supported by a more qualitative assessment, verifying the results through extensive literature review and placing each indicator in the specific national context. Furthermore, the assessment is unique in combining this data analysis with stakeholder consultation.

The GGPA's stakeholder consultation relies on the Delphi method in order to identify priorities. There is a large spectrum of weighting or prioritization techniques in the context of multi-criteria decision-

making (MCDM) methods.[12] While a comprehensive literature review would go beyond the scope of this report, a few general observations are relevant in the context of the GGPA.

There is no "objective" or "correct" way to determine priorities or assign weights. Whether or not a methodology is suitable depends on which multi-criteria problem it is meant to solve and for which purpose it is employed (Ananda and Herath 2009; Roszkowska 2013; Zardari 2015).[13] Therefore, characteristics—such as an individual methodology's transparency, the complexity of calculating the results, and the involved costs—are, in many cases, just as important as technical soundness. There are a number of frequently used methodologies to assign weights to different options. Each has different advantages and disadvantages, along with the criteria mentioned above. These popular techniques include pairwise comparisons as the basis for the analytic hierarchy process (AHP), budget allocation method, trade-off weighting method, rank ordering centroid, and Delphi method (which is used as part of the GGPA) (OECD 2008; Zardari 2015).

Conceptually, the GGPA came with certain basic requirements that any weighting methodology had to align with. This includes (1) the need to engage stakeholders and reflect their opinions in the identified priorities, (2) a strong preference for a simple and transparent methodology that stakeholders could easily comprehend, (3) the need to share the results among all participants instantaneously, (4) the possibility of immediate feedback and repetition of the survey, and (5) a process that requires the least time possible.

First, the GGPA methodology is aimed to consult stakeholders on their priorities. Given this requirement, all methodologies that exclusively rely on the structure of the data to determine the weights of different aspects were deemed unsuitable (e.g., principal component analysis, factor analysis).

Second, the GGPA required a simple and transparent method for identifying stakeholder preferences, with all participants being able to easily understand and interpret the results. This disqualified the more complex approaches, such as outranking, regime, permutation, and evamix methods (compare Zardari 2015). For example, Chang et al. (2010) considered the trade-off method as too complicated, stating that some participants had severe difficulties understanding the underlying logic behind it.[14]

Third, the GGPA stakeholder consultation is designed to bring fifty to one hundred participants together in a one-day setting. This is to ensure that stakeholders have the opportunity to interact and discuss the results among themselves. It was deemed unrealistic to expect longer or multiple engagements with numerous senior-level administrators while a remote survey would lack the element of interaction and feedback within the group.[15] This comes with the need to gather input and share results quickly, avoiding time-intensive methods and complex computations of results. Both AHP and the budget allocation method were discounted for that matter.[16]

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[12] The spectrum of existing approaches is so vast that experts do not even agree on common categories to distinguish and group different approaches. It is also reflected in the fact that there is no agreement on terminology, with multi-criteria decision-making, multi-criteria decision analysis, multi-objective decision making, multi-attributes decision making, and multi-dimensions decision-making being used synonymously (Zardari 2015).

[13] Abrishamchi et al. (2005) state that selecting an appropriate MCDM from a wide range of available MCDM methods is a multi-criteria problem itself.

[14] Fatthi and Fayyaz (2010), Morais and Almeida (2010), Delgado-Galván et al. (2010) agree with that assessment.

[15] Remote surveys would also likely result in lower response rates.

[16] AHP is a weighting method based on pairwise comparisons. For a given objective, the comparisons are made between pairs of individual attributes, asking which of the two is more important, and by how much. If (n) is the number of attributes, then the number of needed comparisons is n*(n – 1)/2. There are two main reasons why AHP was deemed unsuitable for the purpose of the GGPA. First, as

Fourth, a modified Delphi method, asking a limited number of questions in multiple rounds was judged to be the most suitable approach given the requirements of the GGPA. The Delphi method comes with its own restraints, such as a bandwagon effect as a result of dominant personalities unduly influencing the group (Anagnostopoulos and Petalas 2011) and fatigue among respondents due to the large number of complex questions (Peng and Zhou 2011). However, some of the general drawbacks of the Delphi method have been addressed in the GGPA's setup, with its simple questions and execution through an anonymous electronic survey. Furthermore, by asking participants for the highest priorities (top eight ranks) and not for assigning weights to each of the thirty-four options, the GGPA captures the advantages of the rank ordering centroid, including the approach's simplicity and accuracy in determining the attributes with the highest importance (Chang et al. 2010; Morais and Almeida 2010; Zardari 2015).

Finally, a general critique brought forward against the Delphi method is that survey participants are often chosen poorly (Zardari 2015). The choice of participants—particularly ensuring representativeness—remains a constant concern when conducting a GGPA. However, this is the case for whichever methodology is chosen for stakeholder consultation.

the number (n) of attributes increases, the number of pairwise comparisons increases quadratically. As a result, the completion of comparisons can become a very difficult and time-consuming task for a participant when the number of attributes is high. For example, as part of the GGPA consultation process, participants are asked to choose priorities from among thirty-four options. This would imply 561 pairwise comparisons—hardly a task anyone would want to perform several times in a single day. Second, the relative weights of the individual attributes are calculated using an eigenvector. This method makes it possible to check the consistency of comparisons through the calculation of the eigenvalues. While this has the advantage of providing a measure of the inconsistency in respondents' replies, the high number of comparisons makes such inconsistencies inevitable and increasingly difficult to reconcile. Once these inconsistencies become too high, the value of the results can be questioned (Karlsson 1998; OECD 2008; Saaty 1980; Zardari 2015).

In the budget allocation method (also called the point allocation method), participants are given a limited number of points (budget) to be distributed over a number of individual attributes, allocating more points to those attributes they consider important. Weights are calculated as the average number of points assigned to an individual attribute. While this method is simple and transparent, it is generally deemed unsuitable for a range of attributes higher than ten (OECD 2008; Zardari 2015). Deng et al. (2000) found that it is a difficult task for the respondents to ascribe higher importance to one criterion by lowering the importance of another as it requires careful consideration of the relative importance of each criterion. If too large a number of attributes are involved, this method becomes time-consuming and can induce serious cognitive stress in the participants who are asked to allocate the budget (OECD 2008; Zardari 2015).

6.Conclusion

The GGPA has been developed for several purposes. The past three years of applying the assessment methodology in seven different countries has shown that the tool not only fulfills its initial objectives but can also be adopted to serve other purposes. First, the GGPA has successfully provided policy advice to governments based on empiric analysis, determining the priorities for green growth interventions. Second, beyond helping policymakers identify priorities, the GGPA has put forward recommendations of how to address those priorities, tailored to an individual country's context. Third, the assessment has helped GGGI identify options for specific programs and projects in a given country.

Beyond that, the assessment methodology has proven its value by serving governments to translate international commitments, such as the Sustainable Development Goals or Nationally Determined Contributions, into local action. Finally, the GGPA has demonstrated its qualities as a communications and engagement tool. In several countries—including Laos, Myanmar, and Nepal—the assessment process and its results were crucial to foster interest in partner countries to engage further with GGGI.

Across all assessed countries, the GGPA broadly served the purpose of identifying green growth priorities and presenting recommendations on how to address those priorities. However, in practice, the way in which the results of the assessment were used differs between countries. In Peru, the assessment mainly served as an input to developing the country's green growth strategy. However, in Lao PDR and Myanmar, it also supported the development of GGGI's Country Planning Framework and identified specific projects. In the case of Cambodia, the GGPA served to provide the analysis and rationale for specific interventions to achieve targets set in the national development plan while in Mozambique, the assessment results were served the full range of the purposes intended by GGGI.

These distinctions in the use of an individual assessment are directly reflected in the nature and scope of the recommendations that are put forward, ranging from the development of policies (e.g., incorporation of emissions targets into the land use policy in Myanmar) to providing advice on specific regulations (e.g., monitoring of industrial waste in Cambodia) to identifying specific infrastructure projects (e.g., off-grid solar solutions for productive use in Mozambique).

Therefore, the process of systematically identifying recommendations that are aligned with the purpose of the assessment has been strengthened over the course of the past three years. The more the analysis is tailored to their needs, the more useful and cost-effective the results of the assessment become for government counterparts and GGGI.

The methodological changes triggered by the lessons learned over the past three years aim to make the GGPA an even more useful tool for GGGI and the organization's partner countries. However, as with any methodology, these changes do not mark the conclusion of the tool's development process. Future revisions and refinements will be needed when additional data becomes available, and another round of assessments will provide further insights into the potential and limitations of the current methodology.

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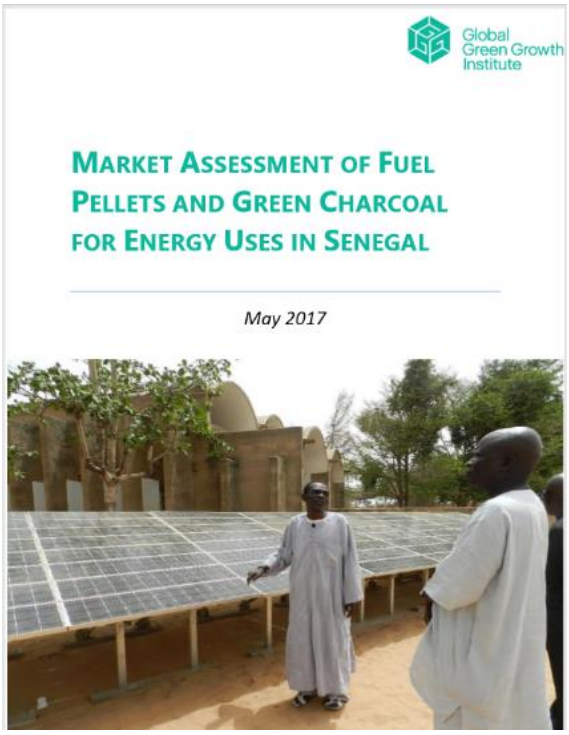

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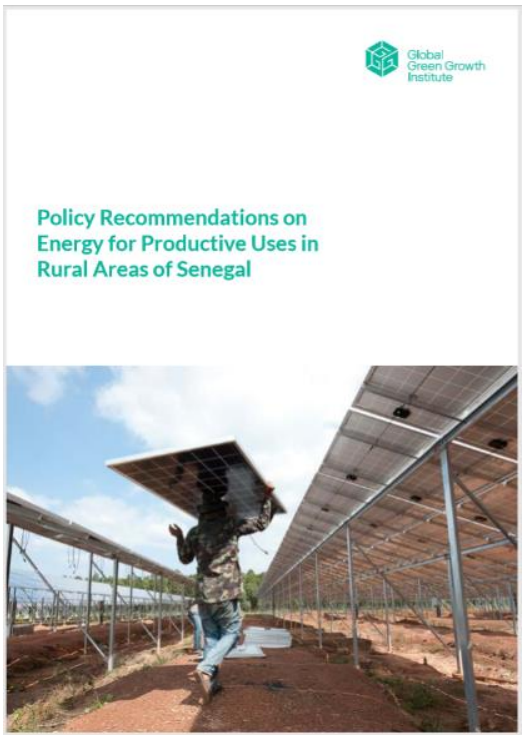

Policy Recommendations on Energy for Productive Uses in Rural Areas of Senegal. GGGI Technical Report #2

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The Global Green Growth Institute was founded to support and promote a model of economic growth known as "green growth", which targets key aspects of economic performance such as poverty reduction, job creation, social inclusion and environmental sustainability.

Headquartered in Seoul, Republic of Korea, GGGI also has representation in a number of partner countries.

Member Countries: Australia, Cambodia, Costa Rica, Denmark, Ethiopia, Fiji, Guyana, Hungary, Indonesia, Jordan, Kiribati, Republic of Korea, Mexico, Mongolia, Norway, Papua New Guinea, Paraguay, Philippines, Qatar, Rwanda, Senegal, Thailand, United Arab Emirates, United Kingdom, Vanuatu, Vietnam

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