

Green Growth Potential Assessment Cambodia Summary Report

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GGGI Cambodia: cover page, page 5, page 6, page 8. Red ivory, Petrochemical industrial plant power station at blue sky reflection, Amata City Industrial, Thailand: page 9.

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GGPA Methodology

The Royal Government of Cambodia (RGC) is one of the first national governments in the world to have established a National Green Growth Roadmap (2010), a National Green Growth Policy (2013), and a National Green Growth Strategic Plan (2013-2030) to demonstrate its desire for green growth in achieving its development objectives. The Policy Alignment for Green Growth (PAGG) program 2017-2018 focuses on strengthening green growth considerations in Cambodia's national policy and investment planning.

In 2018, the RGC began preparing the Rectangular Strategy and the National Strategic Development Plan (NSDP) for the period 2019-2023. As part of the PAGG Program, the Global Green Growth Institute (GGGI) conducted a Green Growth Potential Assessment (GGPA). The results of the assessment and its recommendations are meant to support the RGC in strengthening the next phase of the country's NSDP, and to achieve its international commitments, such as the Sustainable Development Goals (SDGs) and the Nationally Determined Contributions (NDCs).

The GGPA is a diagnostic tool developed by GGGI which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth. The GGPA process consists of the following three stages: (1) preliminary assessment based on data analysis; (2) validation of the preliminary assessment and consultation with stakeholders; and (3) sector analysis and the development of recommendations (See Figure 1). This design aims to ensure that the assessment process is systematic, objective, and participatory.

Figure 1 Overview of the GGPA Process



Source: GGGI

The detailed GGPA country report presents the findings of the GGPA process for Cambodia, highlighting a set of 12 recommendations

underfed by a solid rationale for each of the green growth priorities. This summary report provides an overview of the recommendations.

Preliminary Assessment

To analyze Cambodia's current performance on green growth, the country was compared to Lower Middle-Income Countries (LMICs) and a selected group of peer countries, including Laos, Thailand, and Vietnam. This comparison was based on 33 indicators across four green growth dimensions, namely Resource-Efficient Growth, Eco-Friendly Growth, Climate Resilient Growth, and Socially Inclusive Growth (Figure 2). The results of that analysis are briefly presented below.

Figure 2: GGPA Framework



Source: GGGI

Resource Efficient Growth

The results of the data analysis show that compared to LMICs, Cambodia's scores are relatively low for material intensity, waste generation, and recycling. Waste generation also received consistently lower scores compared to the three peer countries, Laos, Thailand and Vietnam. In addition, agricultural productivity received low scores when compared to Thailand and Vietnam.

Agricultural productivity is of particular importance in Cambodia, accounting for about 29% of GDP and almost 80% of rural employment in 2015.

Figure 3: Resource Efficient Growth



Eco-Friendly Growth

Cambodia performs well in mitigating natural resources depletion and water stress when compared against LMICs. However, it should be noted that the indicator measures annual water withdrawal compared to annual renewable supply for the entire country. It does not reflect the fact that water accessibility is severely restricted by geography, climate (90% rainfall during May to November), and water management (storage, irrigation and distribution systems). Cambodia scores lower than its peers on the quality of natural assets, such as air quality, soil health, and change in forest cover.

Climate Resilient Growth

Regarding climate resilient growth, Cambodia performs well on the carbon intensity of its economy. The country received low scores for renewable energy, which under the GGPA methodology excludes hydropower. Climate change indicators are presented as a disaggregation of vulnerability to the adverse impacts of climate change. While Cambodia shows less exposure than other countries to climate change, the country's adaptive capacity is lower than that of other countries in the region. This is particularly relevant given the prominence of the kingdom's agriculture sector.

Socially Inclusive Growth

For indicators measuring socially inclusive growth, Cambodia outperforms its peers in measures of poverty and income inequality. The country scores lower than peers on good governance and scores consistently lower than Laos, Thailand and Vietnam regarding education. While good governance is essential to establish binding regulations and ensure enforcement, education is necessity to reduce poverty and raise income levels.

Figure 4: Eco-Friendly Growth



¹ Comparative data on fishing pressure and water quality is not available for Cambodia

Figure 5: Climate Resilient Growth



Figure 6 Socially Inclusive Growth



Stakeholder Consultation

An essential part of the GGPA is to gather input from a broad range of stakeholders through an interactive workshop. This workshop serves to validate and/or revise the initial findings from the preliminary assessment. 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 GGPA consultation workshop was held on 27 July 2017 in Phnom Penh with more than 80 participants representing different ministries and departments of the RGC as well as representatives from developing partners, NGOs, academic institutions and the private sector.

Participants identified five priority issues for green growth in Cambodia (Figure 7). Three of these areas can be described as technical or economic challenges:

- Improve productivity and reduce the depletion of natural resources,
- Support renewable energy to strengthen economic competitiveness and improve rural livelihoods, and
- Strengthen adaptive capacity to increase economic resilience.

The remaining two priorities represent crosssectoral challenges, and participants regarded them as enablers to make advances in the first three areas:

- Good governance, and
- Education.

Figure 7 Identified Priority Areas



Country Report

The identified green growth priorities served as the starting point for this report. Specific recommendations were developed for each of the priorities and for consideration regarding the Rectangular Strategy for the period 2019-2023. The analysis was informed by existing policy documents and technical analysis relevant to the identified priorities, as well as



interviews with more than 20 technical experts in Cambodia (Figure 8).

Results and Recommendations

Strengthen Adaptive Capacity

> Employ alternate wetting or rainfed rice production to limit drought impact.

Examples from Cambodia and Vietnam demonstrate that alternate wetting and drying has multiple benefits, including but not limited to (1) increasing yields and thereby increasing rural incomes; (2) reducing the investment needs of large scale irrigation; (3) reducing the use of fertilizer and chemicals; and (4) reducing GHG emissions.

Because alternate wetting and drying does not align with traditional rice growing practices which rely on continuous flooding of paddies, farmers will require support to successfully employ this technique. Such support includes sound land use planning and training of extension staff to introduce this practice in consensus with local farmers.



Relax import restrictions on climate resilient seeds to facilitate the use of climate resilient crops.

Many farmers in Cambodia are unable to access or purchase high-yield rice seeds. This lack of access is identified as one of the top three impediments to improving agricultural productivity. Given that Cambodia's agricultural sector must be more robust and productive to counteract adverse effects of climate change, facilitating the use of climate resilient crops is a crucial measure.

Many of Cambodia's improved seeds originate from Vietnamese and Thai research and development. Cambodia's agricultural sector can benefit from the research results of neighboring countries because these countries have similar agro-ecological characteristics and market preferences. However, relaxing import restrictions should be coupled with establishing and enforcing quality standards for imported seeds to avoid flooding the market with lowerpriced sub-standard seeds and the spread of invasive species.



Establish and enforce standards for road construction and irrigation infrastructure to strengthen resilience towards climate change.

Strengthening the resilience of infrastructure is a crucial element in increasing Cambodia's capacity to adapt to the adverse impacts of climate change. Road infrastructure and irrigation networks are capital-intensive, longlived and essential for the wider economy. Unsuitable design and poor quality of construction are major reasons for sub-standard performance of irrigation systems and reoccurring road damage in Cambodia. For example, the majority of existing irrigation schemes have not been designed to cope with climate-change related effects such as water scarcity in the dry season.

Calculations for flood protection are used as an example to show that the economic benefits of making infrastructure more resilient to climate change considerably outweigh the investment costs. Increasing infrastructure resilience requires the impacts of climate change to be a key consideration in the way that infrastructure is planned, commissioned, designed, built and maintained. Therefore, it is recommended for the Royal Government of Cambodia to promote the development of standards to make infrastructure more resilient to the adverse impacts of climate change. Standards should be accompanied by accounting for climate risks when making public sector investments, allocating risk and associated liabilities between the public and private sector. Finally, the introduction of standards can be supported by aligning spatial planning with fiscal incentives.



Support off-grid renewable energy to increase electricity access in remote rural areas.

Cambodia has made substantial progress in increasing the level of rural electricity access. In mid-2015, 85% of communes and more than 60% of households were connected to the electricity grid. The RGC aims to achieve full electrification of villages by 2020, and 70% household electrification by 2030. Nevertheless, some 4 million people are likely to continue without access to electricity until at least 2030. The RGC could consider off-grid renewable energy for rural electrification as a reliable and cost-effective alternative to grid expansion. Local off-grid and mini grid photovoltaic systems avoid the investment costs for the transmission infrastructure and reduce transmission and distribution losses that are particularly high over long distances. Furthermore, electrification through off-grid solutions avoids relying on the current practice of privately financed Build, Operate and Transfer (BOT) contracts, that have been criticized as opaque and potentially expensive. Furthermore, off-grid solutions will create local employment opportunities for installing and maintaining the equipment in rural regions.

To ensure that investing in off-grid infrastructure is an attractive option for investors, coordination is needed between grid expansion plans and offgrid electrification. Uncertainty around grid extension plans undermines investor confidence, as grid arrival might render the off-grid infrastructure obsolete. A detailed and reliable rural electrification master plan can minimize the risks of grid arrival to off-grid power sites and enable companies to plan their investments.



Simplify licensing for businesses and private end-users to install solar photovoltaic technologies for independent use.

Businesses and private end-users could save considerable costs if allowed to generate electricity for own use. Electricity from solar power represents a substantial cost saving opportunity, but uncertainty regarding licensing inhibits its deployment. Therefore, the RGC should simplify the licensing process and provide regulatory certainty for both gridconnected and off-grid systems.

For off-grid installations, there is substantial uncertainty regarding approval of generation licenses (stand-alone systems and mini-grids) and distribution licenses (mini-grids). In addition, both stand-alone systems and systems that connect multiple households are currently prevented from grid connection. Providing regulatory certainty for the licensing of either of those systems would facilitate rural electrification and help the RGC deliver on its aspiration of universal access to electricity.

Solar installations that are supported by a grid connection as a backup are an important factor in reducing electricity costs of businesses. However, like off-grid systems, regulatory uncertainty and license restrictions for installing grid-supported renewables represent a major impediment to the deployment of such systems. Cambodian auto-producers are currently prevented from grid connection and, as a result, cannot rely on grid-electricity as a backup. Without such a back-up, installations are considerably more expensive as they require sufficient capacity to meet peak loads as well as additional battery storage capacity. Therefore, a combination of auto-produced electricity from renewable sources and a grid connection to manage variations in output and spikes in demand is essential to reduce financial costs and enhance competitiveness.



Strengthen the role of the Electricity Authority of Cambodia as an independent regulator.

An independent regulator with a clear mandate and the authority to enforce legal provisions is essential for an efficient and transparent electricity sector. To achieve the agreed goal of increasing access to electricity and respond to growing electricity demand, the Electricity Authority of Cambodia (EAC) needs the mandate to impose obligations through licensing, permitting, accrediting, approvals, inspections, fines, and other legal instruments.

An independent regulator with a strong mandate is needed to ensure that revenues are sufficient to attract additional investment in electricity infrastructure to ensure reliable power supply at the lowest price. Strengthening EAC as an independent regulatory body includes providing it with a clear role and authority in relation to other government actors, improve its transparency and accountability, strengthen its financial independence, promote the independence of its leadership, and recruit staff based on their technical qualifications.



Incentivize investment in renewable energy by providing appropriate financing instruments.

Promoting the deployment of renewable energy requires that investment is incentivized. A successful example of how to mobilize private investment for renewable energy is Thailand's Renewable Energy Revolving Fund. It can serve as a template for the establishment of a similar fund in Cambodia.

The fund's low interest loans to banks and a partial credit guarantee scheme successfully expanded commercial financing for renewable energy projects. Access to the fund enabled commercial banks to develop a deeper understanding of project risks, costs, returns, and technology performance. Three to four years were required for the fund to achieve an acceptable application rate, critical for commercial lenders to develop confidence in the renewable energy sector. Improved lending confidence in the sector meant local commercial banks were eventually able to lend independently of public funds. In turn, the fund effectively reduced financial barriers for project developers and service providers. It allowed investors to lower their required rate of return on projects and enabled a private sector service industry to emerge with sustainable business models, reducing credit risks. Ultimately, the fund's mechanisms reduced government transaction costs and time by allowing local banks to on-lend public funds.

Improve Natural Capital Management

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Finalize the mapping of land concessions through remote sensing to improve regulation and law enforcement.

The enforcement of forest management regulation is weak due to a lack of clearly designated concession areas. At present, boundaries of forest concessions are poorly delineated and defined. However, if an area is not properly designated, it cannot be protected. Estimates suggest that a substantial share of forest loss is the result of clearing in concessions and conversion forests, without either the monitoring or management prescribed by the Ministry of Environment and the Ministry of Agriculture, Forestry and Fisheries.

To prevent such clearing, the responsible ministries should finalize the mapping of economic land concessions. This mapping should serve as the basis for improved regulation and law enforcement. For example, after accurately defining tenure boundaries, remote-sensing technologies and existing datasets could be used to monitor adherence to those boundaries.



Increase legal anchoring of certification to promote access to high value timber markets.

Forest certification is an important non-state regulatory tool to set and enforce standards for the management of forests. Internationally recognized and endorsed forest certification is a key element to accessing high value timber markets and accessing global carbon funds through the REDD+ scheme.¹

The Forest Stewardship Council, the Programme for the Endorsement of Forest Certification, and

conservation, sustainable management of forests, and enhancement of forest carbon stocks.

¹ REDD+ stands for efforts to reduce emissions from deforestation and forest degradation, and foster

the International Tropical Timber Organization are organizations with widely endorsed forest certification schemes. FAO estimates suggest that only a fraction of Cambodia's nearly 9 million hectares of forest are certified by the Forest Stewardship Council. Therefore, there is a large untapped potential for expanding certification.

Certification also provides the foundation for the Forest Law Enforcement, Governance and Trade Voluntary Partnership Agreement (FLEGT VPA) with the European Union. REDD+ focuses on land use planning and tenure allocations, FLEGT focuses on an implementation framework and economic incentives to drive a viable and sustainable timber industry. Combined, the programs introduce opportunities for improved governance, forest laws and regulations, transparency, technical and rights-based approaches to sustainable forest management, monitoring, and reporting systems.

> Introduce a holistic measure of agricultural productivity based on the concept of climate-smart agriculture.

Currently, no standardized measurement of agricultural productivity exists in Cambodia. Traditional metrics measure productivity based on indicators such as yield per hectare, labor per hectare, tons of aggregate production, gross margins and GDP contribution. Typically, these measures exclude reductions in ecosystem services and vulnerability to climate change and other exogenous shocks. Due to the challenges that confront Cambodia's agriculture sector, the use of indicators based on the concept of climate-smart agriculture (CSA) as a more holistic means for measuring agricultural productivity is recommended. Reduced to a simple formula, climate-smart agriculture can be described as

CSA = Sustainable Agriculture + Resilience – Greenhouse Gas Emissions.

First, measuring sustainable agriculture requires indicators that reflect traditional measures of productivity such as yield. In addition, it requires indicators to assess the ecosystem services on which agriculture depends such as water (water use per hectare or unit of output), soil quality (nutrient levels, erosion, fertilizer use), and conversion of forest land to agriculture affecting both water and soil.

Second, in order to assess resilience to climate change, exposure, sensitivity and adaptive capacity need to be considered. Assessing exposure requires an examination of weather conditions (temperature, precipitation, etc.), an analysis of flood and drought risks, and an estimation of potential changes based on climate forecasts. Sensitivity captures the impact of climate change on a sector or region. Among others, relevant indicators measure poverty levels, flood damage to infrastructure, agricultural output and forced migration. Adaptive capacity reflects the ability of a region to reduce the adverse impacts of climate change, captured by indicators such as seed and crop variety, capacity and quality of food and seed storage, as well as capacity and guality of water distribution and storage.

Third, indicators need to capture GHG emissions from the agriculture sector as well as any conversion of forests into agricultural land and the associated loss of carbon storage.



The RGC has undertaken a commendable first step to promote energy efficiency measures by drafting the National Energy Efficiency Policy 2018-2035. An urgent next step is for the government to adopt and implement the policy. This needs to be followed by defining standards, drafting provisions (e.g. on data collection), and implementing both through adopting the necessary regulations. This will provide a reliable policy framework and regulatory certainty, encouraging companies to invest in energy efficiency measures.



Introduce pollution control standards and strengthen data collection to bolster monitoring of industrial waste.

Consistent data on industrial solid waste, waste water and recycling is scarce in Cambodia. Standardizing data collection on industrial waste is essential to develop waste management plans and meet the objectives set out by the government. Laws and technical regulations are required to better understand industrial pollution, improve pollution control and strengthen the ability of authorities to monitor pollution. These laws and regulations should identify standards and thresholds. They should also determine what data is collected and who collects it. Finally, in order to enhance enforcement of those regulations and standards, existing data collection procedures and monitoring practices need to be strengthened.

In this context, Cambodia could benefit from the high percentage of industrial waste being generated by a limited number of industries, at a limited number of sites. Therefore, a large reduction in industrial pollution and improved waste management could be achieved by focusing attention and resources for monitoring and enforcement on a limited number of industrial facilities.



Promote energy efficiency recognizing that it represents one of the highest-return and lowestrisk investments.

At present, the Cambodian industry struggles to match the production costs of its regional competitors, such as Vietnam and Thailand. One of the decisive reasons for this lack of competitiveness is the high cost of electricity in the country. Increasing energy efficiency will bring about considerable reductions in electricity costs for companies and improve the competitiveness of the industry sector.

Case studies of Cambodian garment factories show that energy efficiency measures reduce energy consumption, bring about substantial cost savings, and reduce greenhouse emissions. The case studies also demonstrate that investments in energy efficiency are paid back in a period of 4 to 18 months. Similar rates of improved energy efficiencies and reductions in greenhouse gas emissions have been successfully achieved in other industries in neighboring countries, such as rice-milling factories and brick kilns in Vietnam.

Conclusion

Ultimately, the GGPA report revealed that there is ample potential for green growth in Cambodia, across a diverse suite of areas and sectors. The assessment highlights that not only Cambodia's economy has considerable potential to grow further, but that this growth can be more resource-efficient, climate resilient, and socially inclusive. The report provides twelve country-tailored recommendations that can support the Royal Cambodian Government in unleashing the country's green growth potential, strengthen Cambodia's international commitments and domestic goals to grow sustainably, improve livelihoods and build climate resilience. This report presents the process and findings of the GGPA of Cambodia. The report synthesizes the results of the assessment process. The recommendations put forward in the report are intended to address priority areas related to green growth in Cambodia. They are meant to identify opportunities for concrete policies and bankable projects to support green growth in the country. They do not represent an exhaustive list of interventions covering the full spectrum of sustainable development needs in the country.



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About the Global Green Growth Institute

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.

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