



Global
Green Growth
Institute

Green Growth Potential Assessment

Myanmar – Summary for NDC Implementation

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19F Jeongdong Building, 21-15 Jeongdong-gil, Jung-gu, Seoul, 100-784, Korea

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Cover photo: R.M. Nunes, Mount Popa arial view, Bagan, Myanmar (Burma).

Page 5: Soft_light, Myanmar, Taunggyi. 18 November. Unidentified farmers work in rice field on November 18, 2015 in Taunggyi, Myanmar. Rice is more than just the staple food; it is an integral part of the Myanmar culture.

Page 6: Stephane Bidouze, Top aerial view of rice field in Myanmar.

Page 7: vividec29, Shwedagon Pagoda glowing at night, Yangon, Rangoon, Myanmar.

Page 8: Left-hand side, top: DR Travel Photo and Video, Industrial background - crusher (rock stone crushing machine) at open pit mining and processing plant for crushed stone, sand and gravel. Left-hand side bottom: Maria Nelasova, Production of lotus tissue from lotus shoots on Lake Inle. Right-hand side: Bule Sky Studio, Temples in Bagan, Myanmar.

Page 9: Top: vividec29, Aerial view city in Yangon, Myanmar. Bottom: OlegD, Mrauk-U, Myanmar, January, 2016, Unidentified Burmese girls and boys in a local school during the lesson.

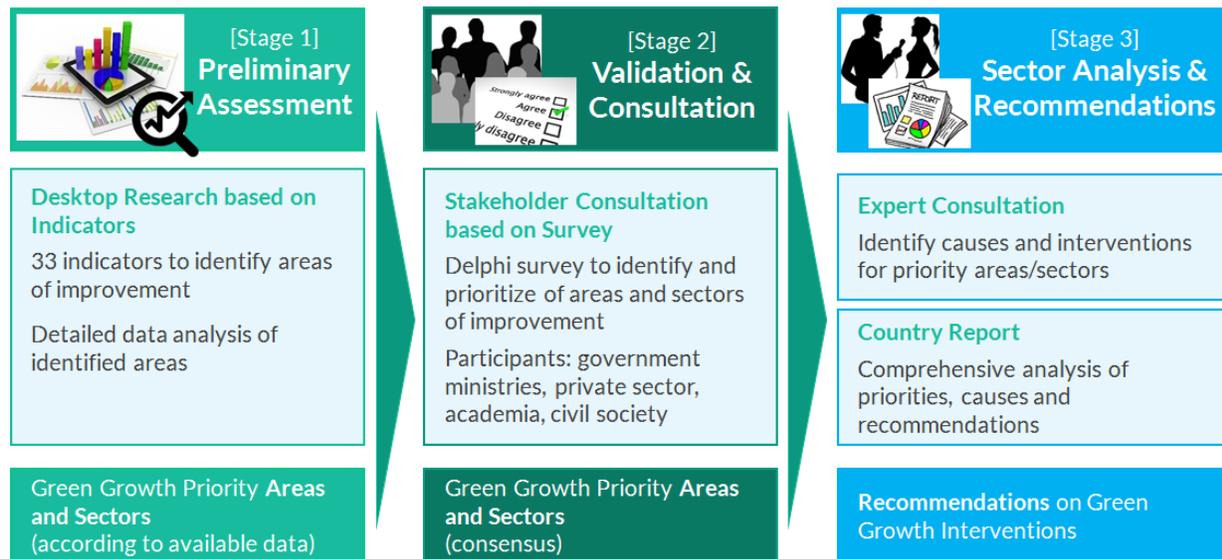
GGPA Methodology

Myanmar is often described as undergoing a triple transition – to democracy, a market economy and peace. In that process the country is attempting to balance rapid economic growth with a commitment to sustainable development. GGGI and the Government of Myanmar recently signed a Memorandum of Understanding confirming their commitments to collaborate in the development of national green growth strategies. Conducting a Green Growth Performance Assessment (GGPA) represents a critical first step in GGGI's consultation with key national stakeholders for defining priority areas

of engagement and will contribute to the elaboration of GGGI's country planning framework (CPF).

The GGPA is a diagnostic tool 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. (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 discusses six sectors, identifying specific opportunities and barriers to green growth in each of these sectors. As part of this process, the linkages between green growth priorities and the related sectors are analyzed. Furthermore, existing gaps and inconsistencies in a country's policy framework and its governance structure are highlighted. This approach helps to identify specific interventions that could support green growth, ranging from

the development of sectoral strategies to suggestions for specific pilot projects.

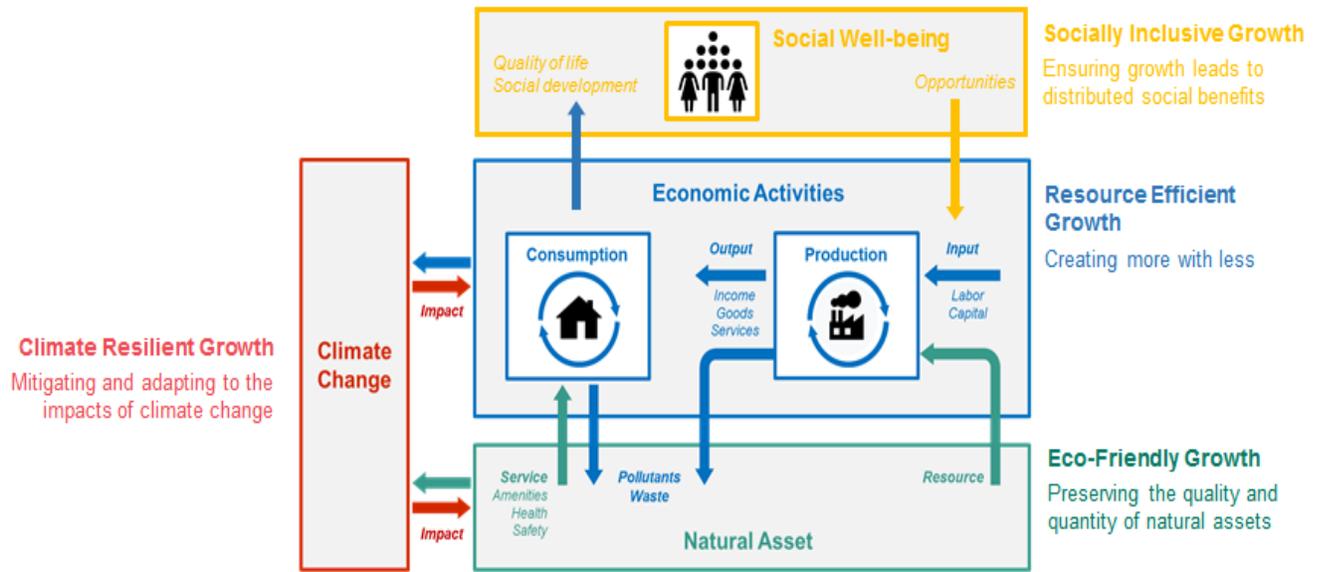
This summary report provides an overview of recommendations relevant for NDC implementation, focusing on related recommendations for agriculture, forestry and land use, energy, and education and governance.

Analysis of Green Growth Areas

To analyze the Myanmar’s current performance on green growth, the country was compared to Low Middle Income Countries (LMIC) and the selected peer countries of Cambodia, the Lao

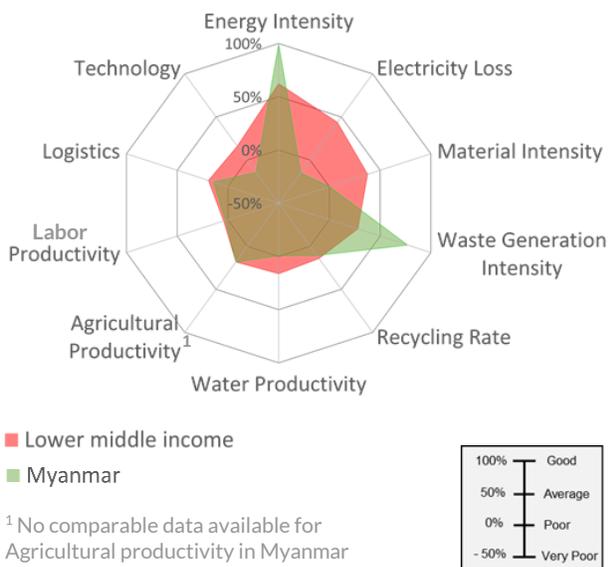
PDR and Vietnam. This comparison is based on 33 indicators across four green growth dimensions, i.e. Resource-Efficient Growth, Eco-Friendly Growth, Climate Resilient Growth, and Socially Inclusive Growth. (Figure 2)

Figure 2: GGPA Framework



Source: GGGI

Figure 3: Resource Efficient Growth

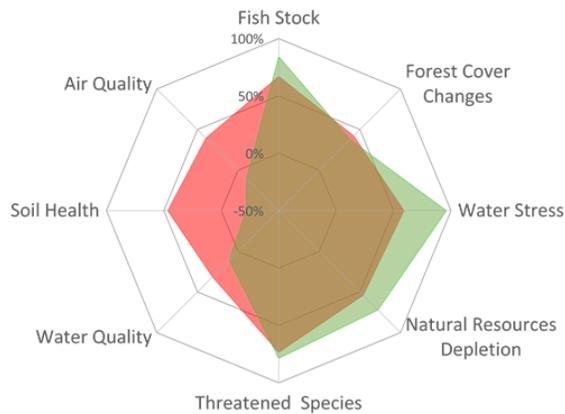


Resource Efficient Growth

The results of the data analysis show that compared to Lower Middle Income countries, Myanmar’s scores are relatively low for resource efficient growth, with the exception of energy intensity and waste generation intensity. That is to say that Myanmar uses less energy and generates less waste per unit of GDP than peer countries.

Agricultural productivity is of particular importance in Myanmar, where over 70 per cent of the population lives in rural areas. No comparative data on agricultural production per km² is available for Myanmar, but sources indicate that agricultural productivity in Myanmar is low. Myanmar has a high level of electricity losses, currently close to 30%, three times the levels in peer countries.

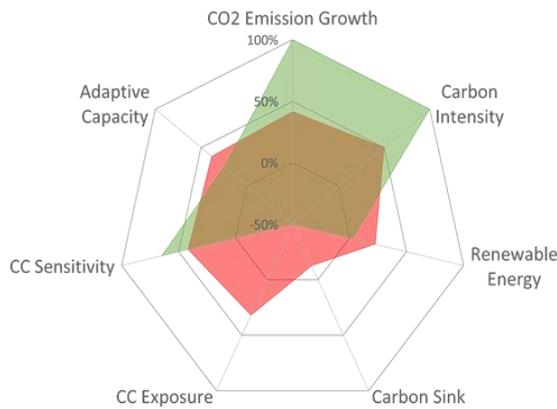
Figure 4: Eco-Friendly Growth



Eco-Friendly Growth

Myanmar performs well in several areas included in eco-friendly growth, namely indicators representing aspects such as fish stocks, water stress, natural resources depletion and endangered species, when compared against Lower Middle Income countries. However, the country scores significantly lower than its peers assessing the quality of natural assets, as measured by air quality, soil health, water quality and change in forest cover. In Myanmar, the rate of forest cover loss is uncertain, but appears to be unsustainably high.

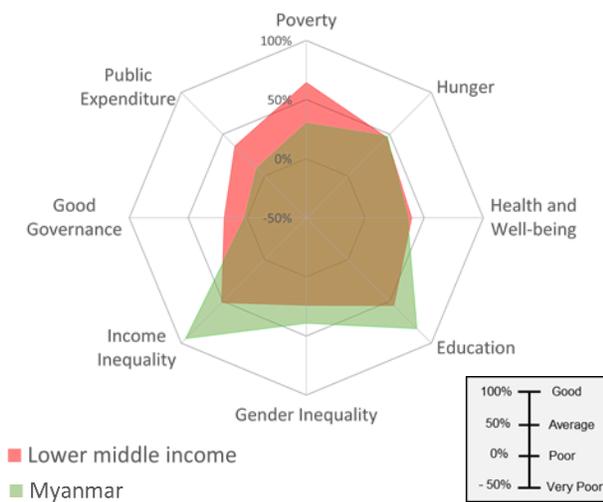
Figure 5: Climate Resilient Growth



Climate Resilient Growth

Regarding climate resilient growth, Myanmar performs well on measures of carbon intensity and CO₂ emission growth. Myanmar shows considerable losses of carbon stock in forests. Climate change indicators are presented as a disaggregation of vulnerability to the adverse impacts of climate change. Myanmar is one of the countries in the world with the highest exposure to the adverse impacts of climate change while its adaptive capacity is relatively low. The country's sensitivity to climate change is high but has reduced in recent years as the economy has diversified somewhat from agriculture.

Figure 6: Socially Inclusive Growth



Socially Inclusive Growth

For indicators measuring socially inclusive growth, Myanmar outperforms its peers in measures of education, gender inequality and income inequality. The country scores lower than peers on good governance, public expenditure on health and education, and poverty.

Poverty is a key constraint to human development. In Myanmar, the percentage of population living under \$1.90 per day, is high relative to peer countries. Myanmar also has a high level of perceived corruption compared to its peers, but the country experienced significant improvements, with its good governance score having doubled over the past decade.

Stakeholder Consultation

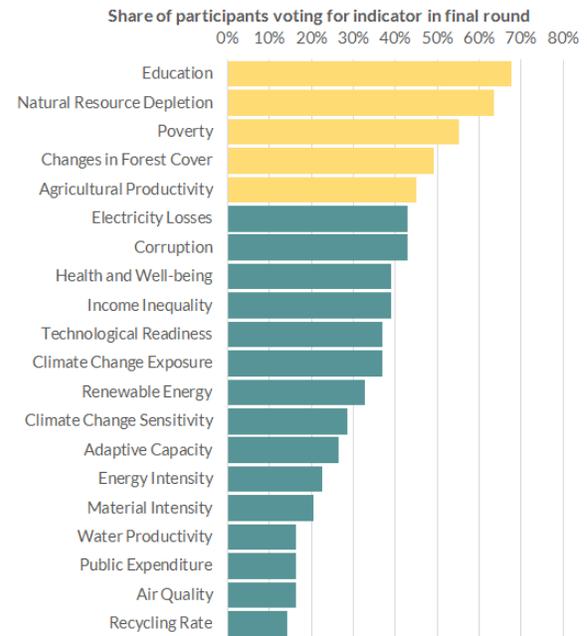
An essential part of the GGPA is to gather input from a broad range of stakeholders through an interactive Delphi-based workshop. The aim is to validate the findings of the preliminary assessment, to select priority areas, and to identify relevant sectors for each of the areas.

The GGPA workshop was held in Naypitaw on 9 February 2017, with 57 participants and staff from institutions representing government ministries, government departments, the private sector, civil society and academia. The sequence of surveys and discussions proved very successful in reaching consensus on the priority areas and sectors across the different government ministries and departments.

The five areas that were prioritized are: education, natural resource depletion, poverty, change in forest cover and agricultural productivity (Figure 7).

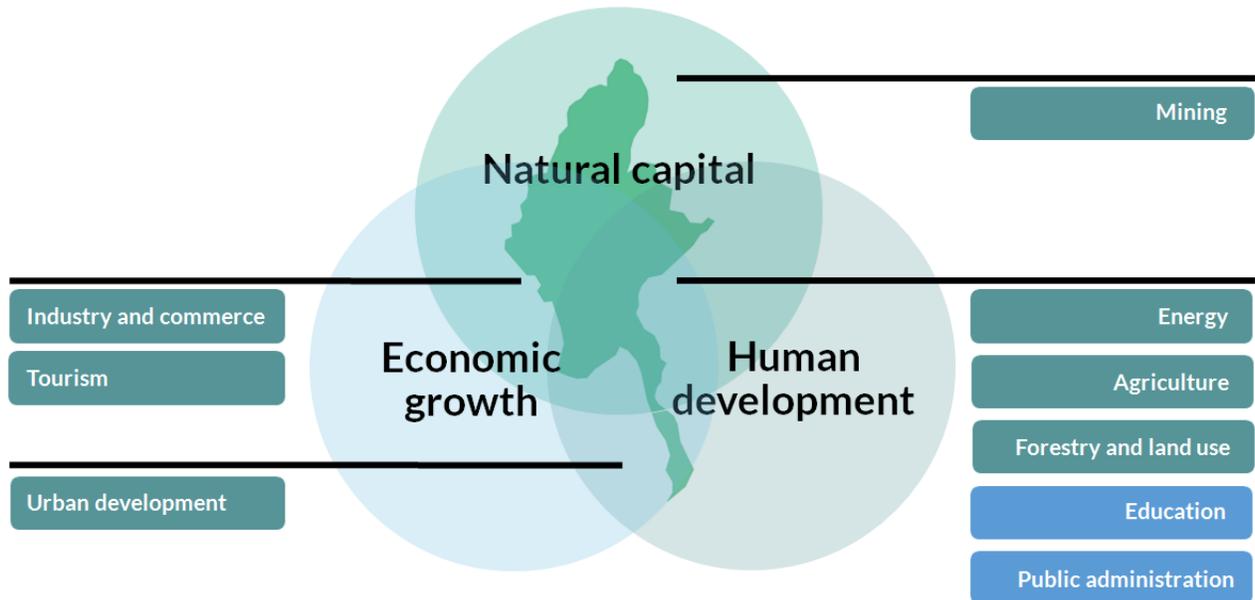
For each of the priority areas the most relevant sectors were identified. Based on the results of the stakeholder consultation and preliminary assessment the following sectors were identified as entry points for green growth interventions in

Figure 7 Identified Priority Areas



Myanmar: (1) agriculture, (2) forestry and land-use, (3) forestry and land use, (4) industry and commerce, (5) mining, (6) tourism, (7) urban development as well as (8) education and public administration as enablers across sectors.

Figure 8 Venn diagram showing the mapping of relevant sectors into green growth themes



Results and Recommendations



Agriculture



Promote diversification of crops, sustainable agriculture practices and new marketing strategies

Myanmar's rice market faces systemic challenges, but these may provide opportunities to transition farmers to more climate-resilient, less water-intensive crops. Constraints in Myanmar's rice output include low productivity of rice paddies, insufficient seed supply and inefficient use of nitrogen fertilizers. Rice requires high levels of water and fertiliser inputs. High demand for water creates pressures on resources, particularly in water-scarce rural areas. Fertilizer use produces nutrient runoff and emissions, which are linked to poor water quality and climate change, respectively.

To improve agriculture productivity and reduce the environmental damage of the agriculture sector, the report recommends to promote diversification of agricultural production and export goals away from rice and towards climate resilient crops including hybrid seeds and organic horticulture. Alternatives to rice also include beans and pulses, which are grown in Myanmar's Central Dry Zones in summer and sell for higher profits than rice.

Crop diversification will likely have to be pursued in tandem with increasing the productivity of rice

paddies. Given the central role of rice in rural diets, farmers are unlikely to adopt more profitable crops until they can be sure of producing enough rice to feed their families. In this context and beyond, climate smart agriculture practices can help to raise productivity.



Support the adoption of climate smart agriculture practices

Agricultural land and rural communities in Myanmar are vulnerable to impacts from climate change. The country is currently relying on low-quality rice production which requires high levels of water and fertiliser for limited returns. Interventions for adapting to the adverse impacts of climate change include climate smart agriculture practices such as changing crop mix, introducing new cultivation technologies and accessing new markets.

Shifting to higher quality, less water-intensive crops can help rural farmers in Myanmar adapt to impacts from climate change while increasing their incomes. For that purpose, extension services should be strengthened and used to disseminate lessons learned from existing climate-smart agriculture technology to farmers, but also to local and regional governments. Furthermore, improving land tenure security will increase incentives for farmers to invest in tree planting to increase water storage, measures against soil erosion, etc.

Adapting technologies for better management of agricultural inputs, such as drip irrigation systems being piloted by the Japanese International Cooperation Agency (JICA) in Myanmar's Central Dry Zone, can also improve adaptive capacity and agricultural output in parallel.

It is recommended for the government to include climate smart agriculture technology such as drip irrigation in its engagement with development partner and when applying for funds from international finance sources.



Forestry and Land-Use



Develop a long-term land use strategy to achieve NDC targets and conservation goals

Myanmar has significant forest resources, which have been threatened by illegal logging and land use changes. The lack of a long-term strategy for forest management has been identified as a barrier to access international finance, develop coherent policies and capacities, and to cooperate across different government branches on forest projects.

Therefore, the report recommends developing an aligned strategy for protecting forest resources in Myanmar. This strategy should set out a path to achieving and improving upon GoM's 30 per cent land cover target and outline the roles of forest management, sustainable agriculture and ecotourism in delivering land conservation targets.

Beyond setting forest protection goals, the plan should include specific activities and their contribution to achieve the identified goals. For example, national emissions targets could be incorporated into land use policy, following the example of Peru. Furthermore, it is recommended to include of community forestry, agro-forestry and community-based reforestation as a means to achieve the strategy's goals, with short- and medium-term targets to measure success. Such a community forestry program should be built on

well-documented best practices established in other countries.



End illegal logging by addressing political causes, economic incentives and strengthening enforcement

Ending illegal logging in Myanmar is a great challenge that will require political solutions and governance reforms to address underlying economic incentives. Only in a context of stability and good governance can efforts to strengthen enforcement bear fruit.

Regional civil conflicts, especially in the northern provinces, prevent safe enforcement of forest rules, opening up forest resources in the area to even greater exploitation. Revenues from illegal logging activities have played a significant role in financing violence in these areas. Therefore, the economic interests along the entire supply chains, and the need for alternative income sources at various stages have to be considered in designing effective policies and to avoid deforestation leakage. In addition to addressing the underlying political causes for illegal logging, community afforestation, community forestry, watershed management incentives such as Payment for Ecosystem Services, distribution of fuel efficient cook stoves, and improving access to electricity amongst rural populations can all contribute to relieving pressure on forest resources.

Myanmar has institutions in place for protecting forest resources, but regulations are not enforced systematically. Capacity for enforcing forest laws is outmatched by the size and complexity of Myanmar's timber industry and demand for household cooking fuel. More resources and personnel are required. In parallel, technical capacities for tracing timber should be developed.



Energy



Promote off-grid electricity from renewable sources to provide electricity access in rural areas

To improve access to electricity in rural areas, consider off-grid electricity from renewable sources as a viable long-term solution. Suitable pilot projects should be identified.

The Government of Myanmar has adopted electricity access as a key priority and its National Electrification Plan calls for 100 per cent access to electricity supplied by the national grid by 2030. However, the planned expansion of the national electricity grid relies heavily on additional generation capacity based on fossil fuels. Projections included in the plan estimate that 30% of the electricity system will be sourced from coal by 2030, increasing emissions from electricity generation significantly. This will make it harder to achieve the country's NDC targets.

Electricity from off-grid renewable sources avoid costly grid extensions as well as the major investments required for centralized electricity generation. They also avoid the increase in GHG emissions associated with centralized power plants generating electricity from fossil fuels. Finally, off-grid solutions such as micro hydro and solar and potentially biofuel gasification installations have the additional benefits of

minimizing electricity losses associated with long distance transmission and avoiding resettlement conflicts associated with large hydropower projects.

To legalize Myanmar's potential for off-grid solutions from renewable energy, it is recommended to assess options to finance such projects. The government is encouraged to develop public private partnerships to provide electricity from renewable sources based on international experience on necessary conditions to attract investments for infrastructure, power purchasing agreements, fiscal incentives and technology-specific financial support mechanisms such as feed-in-tariffs, etc. Pilot projects should be deployed to test different approaches and demonstrate the viability of such projects.



Assess the costs and benefits of measures enhancing energy efficiency

Energy efficiency standards for buildings, industry, transport and appliances play an important role in decoupling economic growth from increased energy demand and GHG emissions. Successful realization of existing energy efficiency targets necessitates specific technical and performance requirements for different sectors.

Experiences in other countries suggest significant energy savings are achievable with well-designed and well-implemented energy efficiency policies. Though, more robust analysis for Myanmar is needed as limited technical information and capacity for systematic regulation of energy use is available to date in Myanmar.

Therefore, the Government of Myanmar is encouraged to evaluate the costs and benefits associated with adopting efficiency measures. Studies should be undertaken around energy efficiency standards and technologies, including lessons learned in other countries that are relevant to Myanmar's development context.



Mining



Develop a revenue sharing model to support enforcement and sustainable development

To reform the distribution of mining revenues, a consultation process should be launched between regions, states, national government and civil society to develop a model for revenue sharing that reflects Myanmar’s goals for preserving the country’s natural capital and develop its human capital. The revenue sharing agreement should include a formula for investing resource rents on education and conservation of natural assets.



Industry



Establish a pollution monitoring and control system

The industrial sector is a key element of Myanmar’s economic development plans.

However, in its current state, the sector is not operating sustainably. Therefore, it is recommended to establish a pollution monitoring and control system. Gaps in existing pollution standards and data collection should be identified. Based on the results, it is recommended to develop a database for tracking and reporting pollution levels.



Tourism



Develop eco-tourism based on conservation needs, visitor demand, and local capabilities

The report identifies eco-tourism as an opportunity to foster economic growth while preserving the country’s natural assets. It recommends developing eco-tourism assets based on market studies and assessments from other ASEAN countries to determine best practices for ensuring that tourism supports forest conservation and protection of cultural sites. This will allow prioritization of eco-tourism sites for investment and inform fiscal policies that link recreational use to conservation funding in protected areas.

For example, experiences in other countries suggest that proposed ecotourism sites should be prioritized according to the conservation benefits, visitor demand, and resources required to strengthen local infrastructure, transport links and skills amongst local residents. Furthermore, a share of the income from eco-tourism activities should be reinvested into forest conservation, enforcement, and education efforts.



Urban Development



Promote urban infrastructure that allows for sustainable urban growth

The report recommends to promote city-level analysis of infrastructure needs and build knowledge on sustainable infrastructure, public transport, district cooling and waste management as solutions to address these needs. It also recommends to strengthen financing of urban infrastructure, including strengthening tax collection systems, creating an enabling environment for the private sector, and introducing innovative finance solutions.



Education & Governance



Integrate topics relevant to green growth in education curricula

The report recommends to integrate topics relevant to green growth and sustainable

development in general education curricula throughout Myanmar, including ecosystem services, sustainable livelihoods, waste management, efficient use of resources and climate change.



Promote the development of labor skills required for the sustainable development of Myanmar

Many of the recommendations mentioned in this report are associated with increasing labor skills in Myanmar. Government-supported training programs should be introduced to build a workforce with the necessary skills to allow for the country's sustainable development, including farmers, staff at eco-tourism sites, technicians for off-grid renewable energy, urban planners, etc.



Strengthen the skills of civil servants

Develop modules compatible with the Civil Service Academy and regional equivalents for environmental enforcement, air, soil and water quality monitoring, incorporating impacts of climate change into policy, sustainable finance and industrial development (including environmental standards and monitoring). Allow for more delegation of authority inside the public administration to reduce current bottlenecks.



Strengthen cooperation across ministries and levels of government

Strengthening cooperation across ministries and levels of government is crucial in many sectors and for numerous initiatives presented in this report, including recommendations made for forestry, agriculture, renewable energy, ecotourism, revenue sharing of resource rent from the extractive industry, and pollution monitoring.

This report presents the process and findings of the GGPA of Myanmar. The report synthesizes the results of the assessment process. Based on the results of this assessment, together with its Country Planning Framework, GGGI aims to support the Government of Myanmar in developing its green growth strategy.

The recommendations are intended to address priority areas related to green growth in Myanmar. 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.

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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