Coastal Landscapes Restoration

**Unlocking Business Opportunities and Policy Barriers
in Support of Delivering Mitigation and Adaptation Goals in Myanmar**

GGGI support for NDC Implementation in Coastal Regions

The Global Green Growth Institute (GGG) support's NDC implementation in Myanmar. Conservation and rehabilitation of degraded mangrove forests in Myanmar's coastal regions is a priority for the Government of Myanamr (GoM) due to the high biodiversity, carbon storage and coastal resilience benefits provided. A Green Growth Potential Assessment identified several challenges to promotion of sustainable landscapes, including: need for diversified and climate smart agriculture, improved (community) forest governance, and improved rural energy security.

A number of GoM policies and strategies prioritize different forest conservation, agricultural expansion, eco-tourism, agro-industrial investments and infrastructural development objectives in Myanmar's coastal zones. Landscape-based approaches are needed to improve alignment between sectoral policies to enhance integration and coordination of sustainable coastal zone economic development. In collaboration with the Government of Myanmar (GoM), and through engagement with the private sector and civil society, GGGI proposes to identify green-growth investment opportunities that support restoration of Myanmar's coastal landscapes.

Restoration and rehabilitation of coastal landscapes will improve social and environmental outcomes across and beyond the landscape, addressing both climate mitigation and adaptation needs. The investments identified will be designed to maximize contribution for Myanmar's Sustainable Development Goals and Myanmar's Nationally Determined Contributions for Climate Action (NDCs) while at the same time providing significant financial returns for investors.

GGGI promotes the development of higher-value sustainable natural capital-based investments that support restoration of degraded coastal landscapes where high biodiversity and ecosystem services are under threat. The Project will focus on developing a pipeline of bankable projects in which public-sector finance sources, including the Green Climate Fund, LIFT, IFAD, FMO and the wider donor and impact investment community will reduce risks to private-sector investors.

Integrated Landscapes-based Coastal Development

Based on GGGI's assessment of ecological and hydrological landscape characteristics and economic value-chains, GGGI will engage with diverse partners to promote an integrated landscape-based coastal development approach. The project will identify best practice technologies for key value chains, and develop innovative business models customized for local contexts to generate revenues for local communities, industries and investors. These high-value products will generate revenues from through sustainable production and utilization of local commodities and their by-products.
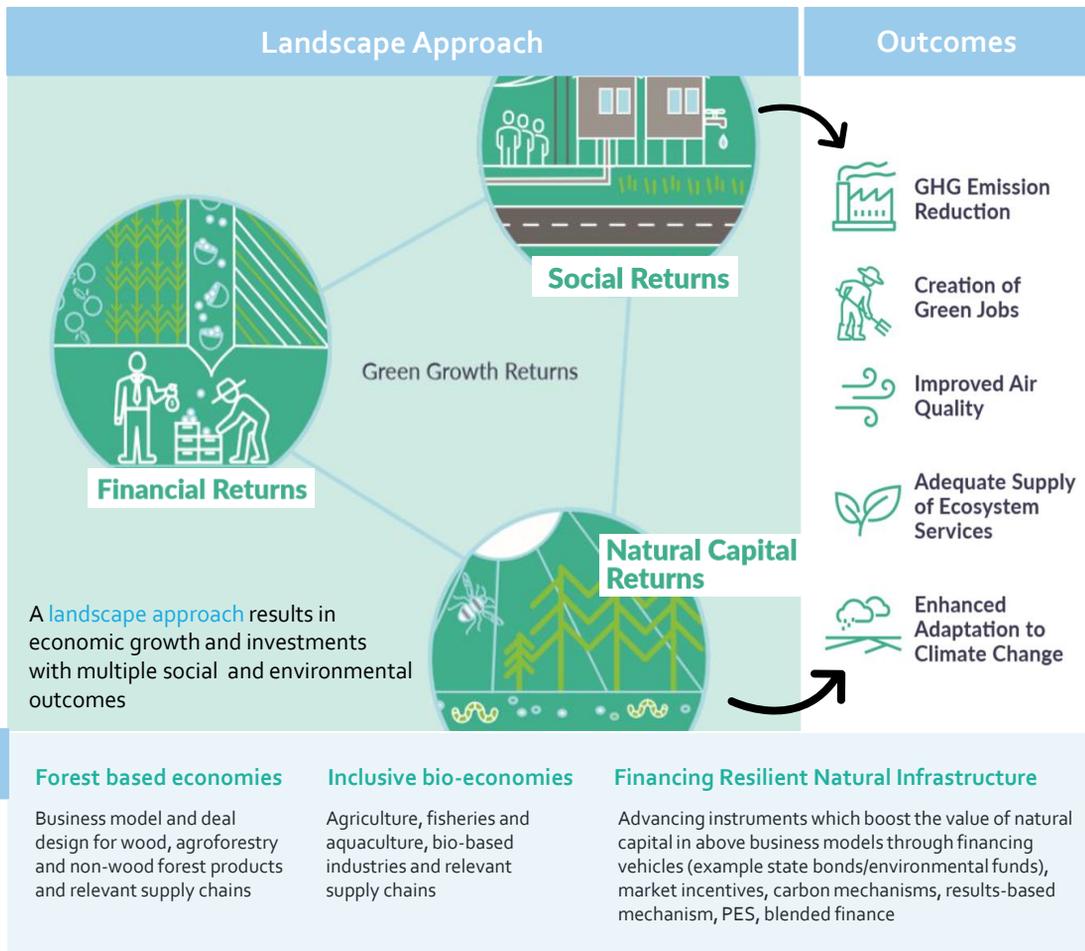
Specific recommendations will be developed for selected agriculture, aquaculture, silviculture, etc., production systems, for the necessary processing, storage, marketing technologies, and for the different forms of stakeholder engagement, organization and contracting. These recommendations and business models will be customized for the local environmental conditions and economic potential of different conservation, buffer and economic zones.

Investment opportunities Seeking to create benefits for both shareholders and communities

GGGI will support a range of investment and policy instruments. The investment pipeline supports communities to collaborate with private sector investors to develop inclusive green business models, gain access to markets and finance, and to address policy barriers that prevent such projects from scaling. Policy instruments include spatial zonation for integrated cultivation and conservation, tradable permits (ex. carbon, water), tax deductions and aligning commodity specific policy incentives to improve policy enabling environments for private sector investment. Collectively, these interventions will have the objective of providing initial market signals for uncertain investments that can trigger a commercial market response at scale.

Figure 1. Investment deals generate three returns on investment

Landscape Approach

Social Returns

Green Growth Returns

Financial Returns

Natural Capital Returns

A landscape approach results in economic growth and investments with multiple social and environmental outcomes

Outcomes

GHG Emission Reduction

Creation of Green Jobs

Improved Air Quality

Adequate Supply of Ecosystem Services

Enhanced Adaptation to Climate Change

Focus Area

Forest based economies

Business model and deal design for wood, agroforestry and non-wood forest products and relevant supply chains

Inclusive bio-economies

Agriculture, fisheries and aquaculture, bio-based industries and relevant supply chains

Financing Resilient Natural Infrastructure

Advancing instruments which boost the value of natural capital in above business models through financing vehicles (example state bonds/environmental funds), market incentives, carbon mechanisms, results-based mechanism, PES, blended finance

Background

Situated in mainland south-east Asia, Myanmar is endowed with a variety landscapes and natural resources, stretching from the Himalayan mountains, to vast deltas and productive offshore waters. Myanmar's natural capital is under threat with peak deforestation rate (1.72%) during the period of 2010-2015. Agriculture, forestry and fisheries sectors contribute approximately 28% to official GDP and provide employment for 70% of Myanmar's population (2015-2016). These sectors contribute $3.1 billion in export earnings, primarily through exports of products such as pulses, rice, shrimp, livestock, and rubber. It should be noted that total economic benefits from forests-based ecosystem services are estimated at roughly 40x the value quantified as GDP.

The Ayeyarwady Region is dominated by the Ayeyarwady River Delta, but also includes a narrow band of land separated by the Rakhine Ridge along the Region's Western coastline. The Delta's land economic production capacity is differentiated by groundwater types: saltwater, brackish water, and freshwater. This region is densely populated but with a largely rural population, and is characterized by having the largest farm plots in the country.

The Ayeyarwady Delta's mangrove ecosystems represent a substantial carbon storage sink, as well as providing habitat for numerous endangered reptiles, mammals, birds and fish species. These forests also are recognized for their significant coastal protection functions during cyclones. Mangrove forest landscapes support fish and marine industries providing crucial sources of protein and rural incomes for many communities and have the potential to support export oriented coastal aquaculture and fisheries.

Due to its proximity to Yangon, the Ayeyarwady Region's mangroves have been heavily degraded for fuelwood extraction and charcoal production, and for expansion of rice paddy and shrimp aquaculture. 2013 estimates show that approximately 45,000 hectares of mangrove forests remain in the Ayeyarwady Delta, a loss of up to 84% since 1980. Furthermore, once cleared, mangrove forest soils only remain productive for a 7-8 years before becoming too acidic for viable agriculture. Similarly, Myanmar's coastal fisheries (much of which rely on mangroves and corals nurseries and habitats) have declined by 50% since 1980.

This loss and degradation of mangrove forests and associated fishery nursery grounds and habitats, and the loss of productivity and salinization of soils due to loss of mangroves combined with poor ground water management exacerbate other economic drivers of rural poverty in Myanmar's coastal communities. Our task is therefore is to realign the economic incentives and strengthen the governance institutions to favor sustainable coastal landscape investments.

Country Priorities

Myanmar's Initially Nationally Determined Contribution (INDC) mitigation targets for 2030 include increasing Permanent Forest Estate (PFE) targets of 30% of the national land area (currently 24.70%) and 10% as protected area systems (currently 7.75%), and for promotion of fuel-efficient cook-stoves. These objectives Myanmar's REDD+ Roadmap (2013), National Reforestation and Rehabilitation Program (2017-2026), Green Economy Policy Framework [draft], Myanmar Climate Change Strategy and Action Plan (2017-2030), Myanmar's Sustainable Development Plan (Pillar 3; Strategy 5.1), and Myanmar Sustainable Development Plan (draft).

With specific regard to mangroves, the government set a target of reforesting 12,000 ha of mangroves by 2026. However, competing policy priorities increase pressures on already threatened ecosystems, as producers and investors respond to new economic opportunities without clear environmental and social safeguards in place. Implementation of the Land Use Law, Fisheries law, Aquaculture Law, and Agriculture Development Strategy present potential challenges for forest sector NDC implementation, but also opportunities if we can promote innovative private-sector investments in socially inclusive and environmentally sustainable business models that contribute to both achieving climate change mitigation and adaptation outcomes and economic growth objectives. The government establishment of an National Coastal Resource Management Committee chaired by the Vice-President demonstrates recognition of these potential tradeoffs and prioritization of this critical area for coordination.

GGGI signed an MOU with the GoM in Feb 2017 to support the GoM in implementation of its NDCs. Through an extensive consultation within and beyond government, GGGI's Green Growth Potential Assessment (*country report*) identified a number of priority areas. The threats to sustainable landscape development in the Ayeyarwady region are clearly in line with some of the key priority areas identified in the GGPA (*summary version for NDC implementation*), including: diversification of and promotion of climate smart agriculture, improvement in forest governance including community forestry and exploration of innovative forest governance incentives, and seeking alternative solutions to address rural energy insecurity challenges.

Proposed Policy and Investment Solutions

Building a bio-economy for green growth

(Figure 2)

Activity Zonation, integrated farming, and building high value products from land, wetland and water source natural capital can create opportunities for inclusive and sustainable economic growth while rehabilitating Myanmar's critical mangrove forests.

Carefully planned farming can create products that can be grown and processed in a more efficient manner that requires less energy, water, animal input (i.e. exchanged to plant based products) and chemical input (i.e. changed to biodegradable inputs). This will result in less waste, less pollution and less reliance on limited inputs. Given the hydrodynamic, geological, ecological, and socio-economic features of the landscape, a spatial assessment of soil types, forest and land cover trends, and expected changes in the delta and coastal hydrology are necessary to inform policy and investment decision making regarding priority and suitable land/wetland/water resource uses.

This analysis will allow stakeholders to define the activity zones: protection (core) zones, buffer zones and production zones. In the specific zones, the most appropriate integrated farming methods may differ depending on its rehabilitation goal and agro-ecological conditions. Other interventions will be proposed to restore freshwater supplies and ecosystem services, including those relevant to carbon sequestration and carbon sinks. This overarching bio-economy approach aims to boost the value of rehabilitated coastal and specifically mangrove ecosystems by specifically building economic activities to improve livelihoods, employment and investments. This approach will support Myanmar to meet economic targets, including import and export of high value products, NDC climate mitigation and adaptation targets, as well as the Sustainable Development Goals.

Figure 2.
Landscape approach to restoration and targeted value chain investment in protected, buffer zone and economic zones
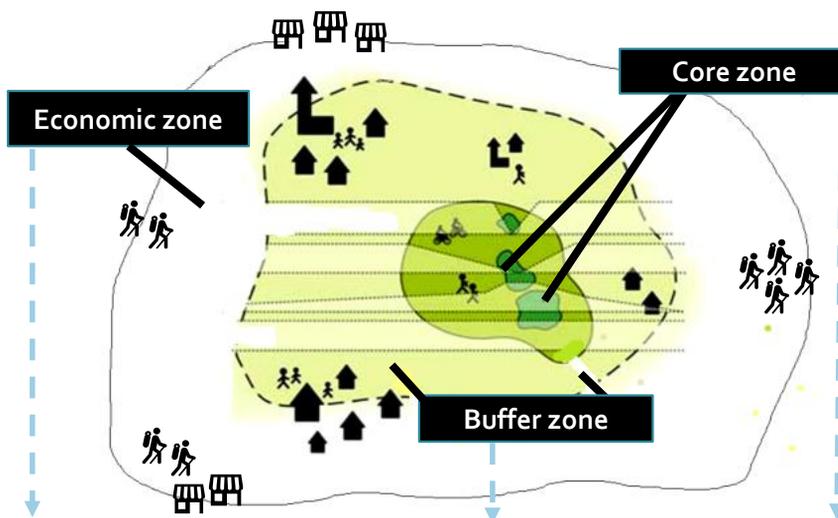
- A much wider range of economic activities that favor the socio-economic development of local populations and that address larger economic drivers of deforestation and landscape degradation.
- For example, improve household energy security through fuel wood substitution, fuel-efficient cook stoves and mini-grid development.

- This is a buffer zone that can host economic activities that are compatible with the core zone conservation objectives.
- For example, design restoration interventions that simultaneously generate revenues from high value add products and value chains, potentially some payment from securing natural capital and strengthened coastal resilience.

- This is the most protected zone, used for the conservation of ecosystems and restoration interventions with most revenues from securing natural capital and strengthened resilience.
- For example; carbon capture, soil stabilization, payment mechanisms to boost value of mangrove forests (carbon, water, biodiversity as assets).

Project Preparation for Investment pipelines (Bankable Projects)

(Figure 3)

In partnership with the GoM, GGGI will collaborate with government endorsed private sector and project developers to ensure environmental and social sustainability risks have been assessed and management measures are implemented. These investment opportunities will be explored in the context of supporting GoM meet its NDC targets and national reporting MRV reporting requirements.

These measures will ensure sustainable benefits to the communities in the area central to all interventions with regard to the following areas of investment:

Investment pipelines for High Value Bio-economy Products

Business models and relevant value chains for high value products will be identified and developed. This may differ for each activity zone. Revenue flows which lead to financial, social and natural capital returns will be assessed, and appropriate business models which enhance rehabilitation, sustainable production and harvesting practices will be designed. Examples of financial revenue flow with markets and off takers could include:
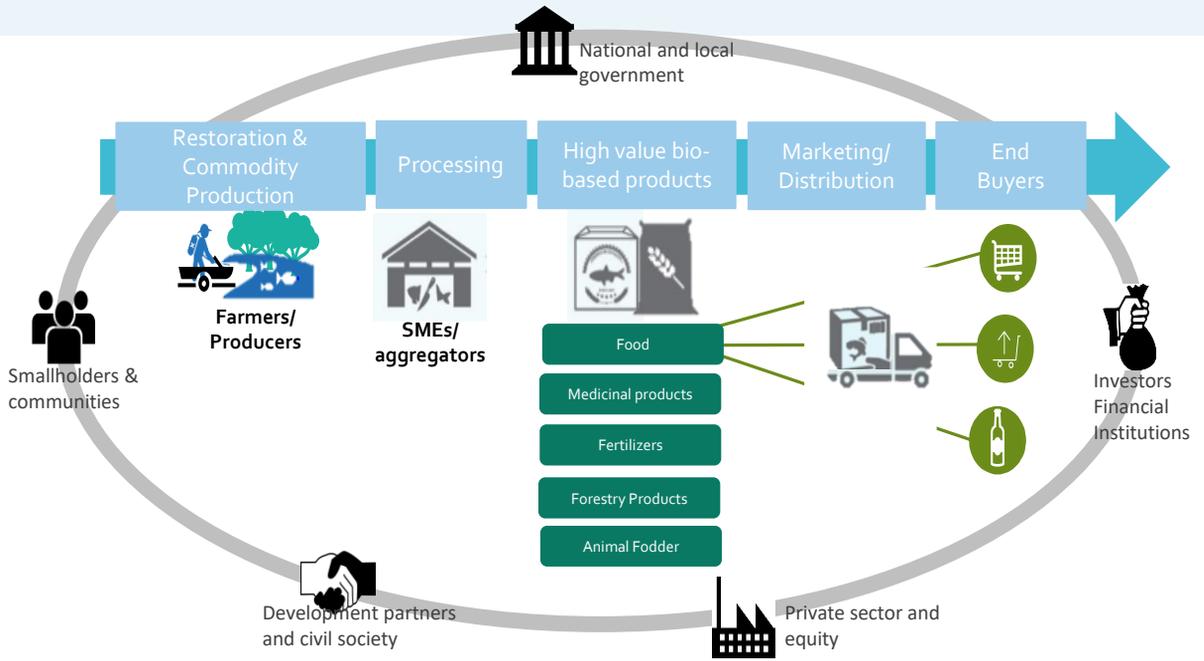
- New agriculture, aquaculture varieties and under-exploited NTFP products,
- Eco-tourism revenues,
- Bioenergy feedstock for conversion to bio-based fuels and chemicals,
- Animal feed from agriculture and marine produce, aquaculture and fisheries,
- Aromatic oils for perfume and cosmetic industries,
- Carbon credits from mangrove reforestation and soil restoration,
- Innovative REDD+ and Blue Carbon initiative at jurisdictional scales.

Investment pipelines for sustainable water management

Value chains specific to water investment pipelines that will be focused on investment-focused activities will include:

- Treated wastewater for commercial irrigation, especially in dry seasons where costs of treatment can be offset by revenues in agriculture,
- Treated faecal sludge and solids for the development of fertilizers,
- Wastewater valorization and generation of biogas,
- Storage of reclaimed wastewater for irrigation and to increase agricultural productivity and forest restoration,
- Low cost stabilization ponds/ lagoons for recreational and ecotourism.

Figure 3.
Design business models across value chain in collaboration with government, communities, investors and project developers

		In parallel to developing business models, bankability will be enhanced by the design of appropriate financial and policy instruments which help to reduce risks and enhance returns. Specific instruments will be identified as the initial work progresses. Examples of such instruments include payment mechanisms or international/domestic tradeable permits for carbon and water assets, revolving funds involving communities, tradable permits (carbon, water etc.), tax deductions and aligning incentives for specific commodities/high value products.
	Preparation of financial and policy Instruments	

		Government, private sector and civil society capacity and institutional development are critical to achieve GoM's relevant targets and goals. These capacities span areas of policy formulation, regulation and enforcement, data collection and analysis, strategic planning, stakeholder engagement, and finally, investments and bankable project development.
	Capacity & Institutional Development	Capacity building objectives will be embedded in the delivery of the solutions, and appropriate measurement criteria will be used to measure effectiveness. Additional financial resources will also be included in earmarked proposal development as opportunities emerge.