This is a new section of the Public-Private Partnership Resource Center website and is currently in draft form. Your feedback is welcome: If you would like to comment on the content of this section of the website or if you have suggestions for links or materials that could be included please contact us at ppp@worldbank.org.

Photo Credit
Reforestation Program Model for ERP, small plant growing out of dirt image

Reforestation Program Model for ERP

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On this page: *Reforestation Program leveraging a New-Finance-Bulk-Tariffs model - Model 12 in the ERP Project Guidelines. Read more below, or visit Strategic Guidance for Country System Assessments, Guidance for Countries in Assessing ERC Projects, or Mobilizing ERC Finance.*

Project Type: Afforestation, Reforestation and Regeneration

Sector: Forestry

Applicable Project Methodology: Afforestation of degraded land, AR-ACM0003 - Afforestation and reforestation of lands except wetlands

This project type targets reforestation and afforestation efforts for forest areas that are currently highly degraded, making them susceptible to further depletion of the existing tree cover.

Proposed Structure of this Public Private Partnership (PPP) Model

The project will be leveraging a **New-Finance-Bulk-Tariffs** model. An experienced forestry operator is provided a long-term lease by the government or state-owned entity to take over management of the forested area. The private sector entity will be financing operations and recovering its investments through the sale of the by-products of the afforestation activity (e.g. bamboo), as well as through the emission reduction credits (ERCs) generated and sold in the voluntary carbon markets.

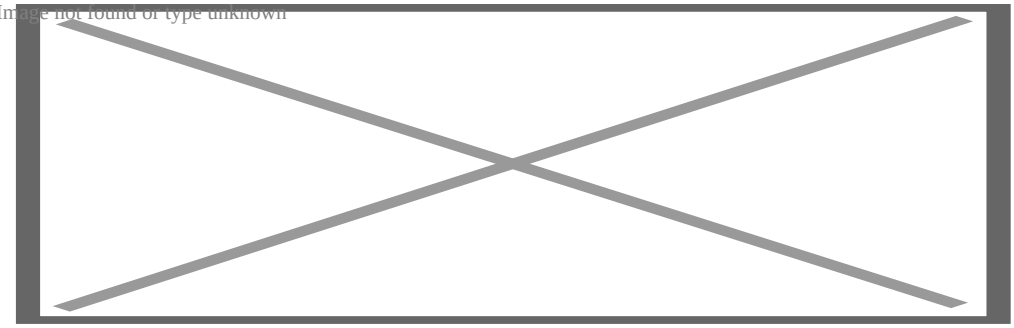
Table 1: Model Attributes

Dimension	Attribute	Description
Business	*New*	This model assumes that the government or state-owned entity grantor will be authorizing a new long-term lease to the project company to take over the management of the forest area.
	Existing	
Construction	*Build*	The project involves the operational and monitoring services from the project company.
	Refurbish	
Private Funding	*Finance*	The project company will be charged with raising financing for the management of the forest area.
Service	*Bulk*	Revenues of the project company will be sourced from contracted bulk purchasers of the forest's by-products

Dimension	Attribute	Description
User		
Service	*Fees*	Revenues in this model will be driven by the tariffs paid to the project company for the by-products produced by the forest.
	Tariffs	

Proposed risk allocation of the Public Private Partnership Model

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Key features of PPP structure

- Private sector entity to design, build, finance, operate and maintain forest area via a long- term concession agreement with the ministry/ government or state-owned entity
- The private sector entity acts as the implementation partner, and is responsible for all activities related to the implementation, management, monitoring and reporting of the project over the project crediting period
- Ministry will work together with private sector entity to develop key elements of reforestation/afforestation project design with private sector entity to provide regular updates on project status
- Potential to include financiers in this PPP structure in exchange for a portion of the ERC revenues earned in this project

Key considerations/risks for proposed project

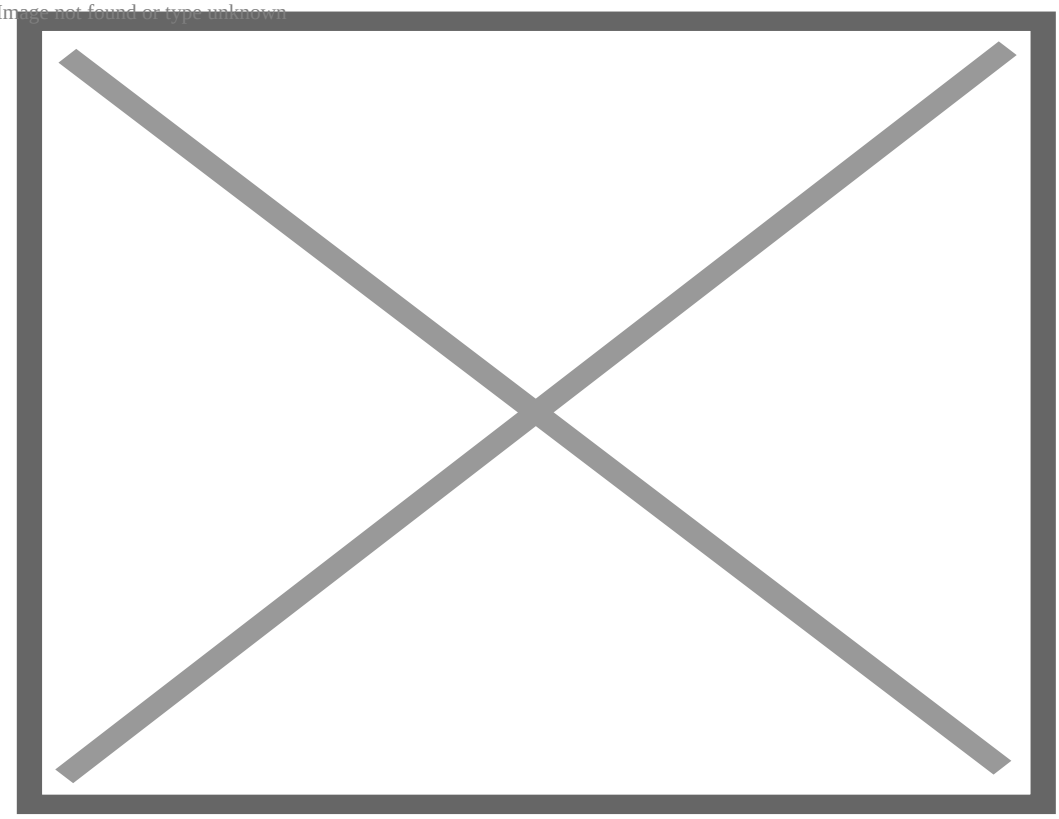
- Extensive stakeholder engagement required to ensure buy-in from local/indigenous communities
- Need to ensure adequate technical local expertise in day-to-day execution and monitoring to prevent carbon leakage
- Co-benefits are accounted for to ensure that local/indigenous communities' economic and social wellbeing are taken for and to avoid disruptive lifestyle changes
- Partnering with a service provider for the project's marketing, sales and pricing is needed to identify potential offset buyers, negotiate contracts, and secure good target price per tonne to enable the financial viability of ERC generation
- Contracting a monitoring, verification and reporting (MRV) service provider with experience in conducting MRV and preparing the necessary documents for generating ERCs in a voluntary carbon market standard will reduce risk of registration and issuance delays or bottlenecks, and strengthen credibility of project's carbon integrity quality

Expected ERC end use

- End use can belong to project developer as part of additional revenue stream

Figure 1: Financing and Activity Flows for the Model

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Case study: Bandai Hills Bamboo Reforestation Project, Ghana

Project description

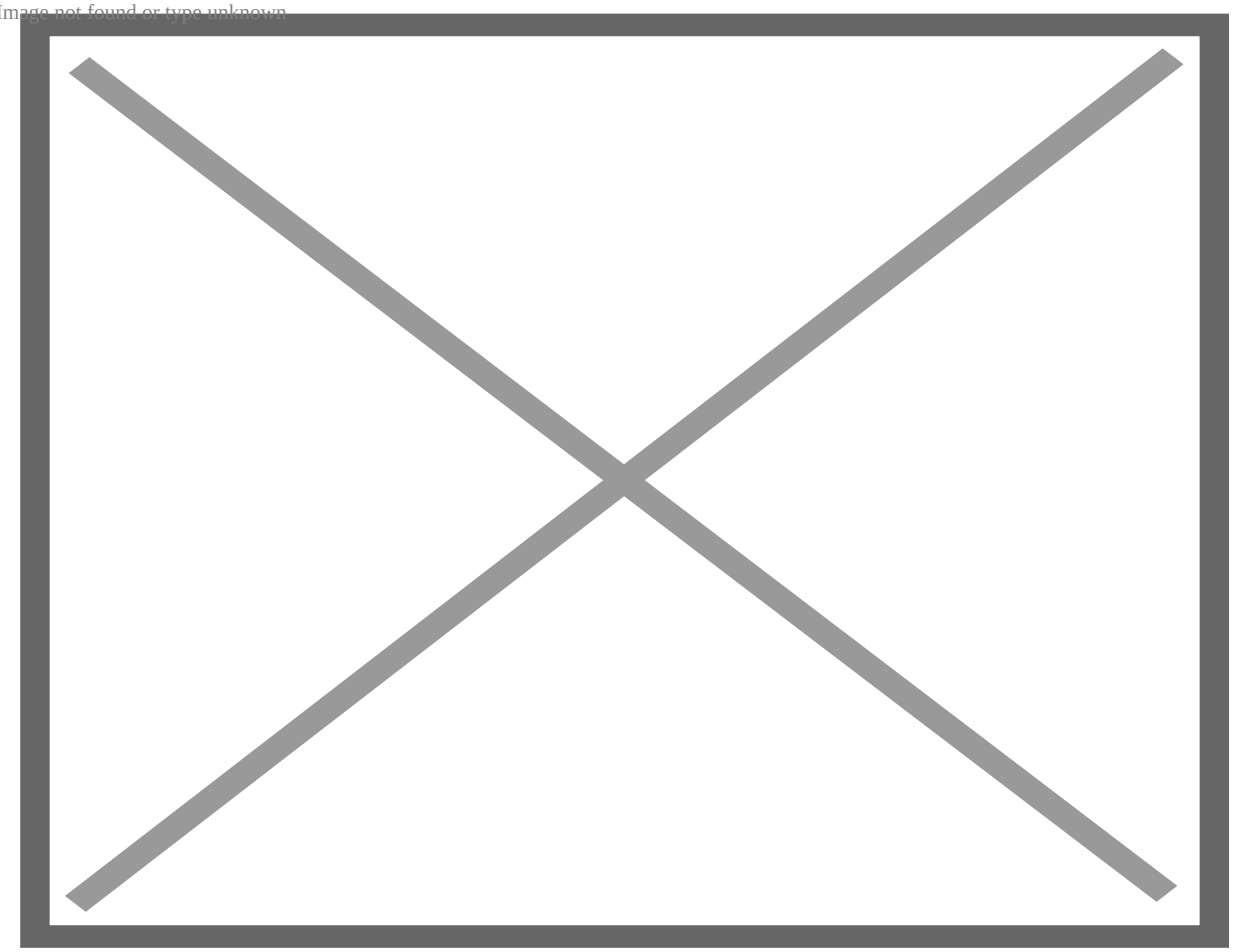
The Bandai Hills Bamboo Reforestation Project is a reforestation project that is restoring 7,818 hectares (ha) of degraded forest lands within the Ashanti Region of Ghana, West Africa. It is a carbon financed project that integrates the reforestation of 1.5 million (M) seedlings of sympodial bamboo with remnant standing trees, and areas set aside for biodiversity and conservation. The project area has suffered extreme historical deforestation and represents highly degraded lands that are prone to further loss of remaining tree cover in the absence of the reforestation activity.

Targeted results

Expected annual ERCs generated from the program will be 188,926 tonnes.

Figure 2: Structure of Case Study PPP

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EcoPlanet Bamboo, the project proponent, operates a PPP with the Government of Ghana, via the Ghana Forestry Commission. The project proponent, EcoPlanet Bamboo, through its subsidiary, EcoPlanet Bamboo Group, LLC holds the contractual right to the land within the project boundary, the bamboo to be planted, and associated greenhouse gas (GHG) emission removals. Within the terms of the Land Lease Agreement, EcoPlanet Bamboo holds the legal right to control and operate program activities, as well as to all and any GHG emission removals generated by the project during the crediting period. The Ghana Forestry Commission are involved and consulted at all stages of its design and implementation of the project and benefits from an annual Ground Rent payment.

Summary of the model financials

The project's Net Present Value (NPV) without ERC in- and outflows – only considering non-ERC inflows through other revenue streams or cost savings enabled by the project – is negative at - $3.95M13. With ERC cashflows, the project will have a positive NPV of $1.61M, which demonstrates the need for such nature-based removal projects to generate ERCs, as non-ERC cashflows alone is not financially viable.

Table 2: Summary of sources of inflows and outflows and key assumptions

Value component	Assumptions	Sources

ERC revenues or inflows	• Four issuances across the project's 20-year crediting period, at year 5, 10, 15 and 20 • $14.16 per tonne today for 789,287 estimated tonnes of ERCs likely generated in the first issuance • 10% price increase to $15.58 per tonne, $25.09 per tonne and $40.40 per tonne for each subsequent issuance of 789,287 estimated tonnes of ERCs	Average Verified Carbon Standard (VCS) price of forestry (removal) project in Africa from Allied Offsets database (2022)
Non-ERC revenues or inflows	• $12,500 per ha of bamboo clums sold, across four bamboo harvests of 500ha, 1000ha, 1000ha, 500ha, each with an estimated harvest cycle of 6 years from the time of planting	Estimated revenue of bamboo clums per hectare in Ghana by Akoto et al. (2020)
Investment cost	• $650 per ha for bamboo agroforestry development as upfront costs, for land, material inputs, tools and equipment	Breakdown of bamboo agroforestry development cashflows in Ghana by Akoto et al. (2020)
Project implementation	• $5000 per ha for bamboo agroforestry development across project's 20-year crediting period, for labour and transport	Breakdown of bamboo agroforestry development cashflows in Ghana by Akoto et al. (2020)
ERC generation	• $10,000 for the project's registration and first issuance • $15,000 for each verification process across four issuance cycles • 0.105c per tonne for subsequent three issuances	VCS Program Fees

Table 3: Net cashflows summary (in USD)

Components	Sum of initial outlays	Sum of in- or outflows from crediting period	Total cashflow
ERC Component			
Revenues/Inflows	0	75,157,113	75,157,113
Costs/Outflows	-10,000	-391,501	-401,501
Net value	-10,000	74,765,612	74,755,612
Primary/Non-ERC Component			
Revenues/Inflows	0	37,500,000	37,500,000
Costs/Outflows	-5,070,000	-39,000,000	-44,070,000
Net value	-5,070,000	-1,500,000	-6,570,000
Net Present Values			
NPV		$1,614,095	
NPV (ERC Component)		$5,565,182	

Components	Sum of initial outlays	Sum of in- or outflows from crediting period	Total cashflow
NPV (Non-ERC Component)	-$3,951,087		

Related Content

- **Guidance for Countries in Assessing ERC Projects (Download PDF version)**

Additional Resources

- Climate-Smart PPPs
- Finance Structures for PPP

This section is intended to be a living document and will be reviewed at regular intervals. The Guidelines have not been prepared with any specific transaction in mind and are meant to serve only as general guidance. It is therefore critical that the Guidelines be reviewed and adapted for specific transactions. Unless expressly stated otherwise, the findings, interpretations, and conclusions expressed in the Materials in this Site are those of the various authors of the Materials and are not necessarily those of The World Bank Group, its member institutions, or their respective Boards of Executive Directors or member countries. For feedback on the content of this section of the website or suggestions for links or materials that could be included, please contact the Public-Private Partnership Resource Center at ppp@worldbank.org.