CARBON NEGATIVE

CORPORATE CARBON CHAMPION

Proposal

Restoring degraded forests into thriving ecosystems

> *We are the first generation*
> *to feel the sting of climate change...*
> *we are the last generation*
> *that can do something about it.*
>
> ***- Jay Inslee***

Introduction

Global climate change and deforestation cause a wide range of negative environmental and socio-economic impacts, fuelling a recent interest in tree planting as a panacea to a variety of problems. High-profile modelling studies have argued that reforestation is among the most effective strategies for climate change mitigation and have generated enthusiasm for tree planting,[1] but have also garnered backlash from ecologists who argue that planting trees is not as simple as it may seem.[2] For example, widespread tree planting may have complex impacts on hydrological cycles, carbon, temperature and albedo, biodiversity, social and economic issues, and can even result in ecosystem 'disservices'.

Hundreds of millions of trees are being planted every year. To make a sizeable impact on climate change and the challenges it brings across many fronts, this is neither enough nor the right approach. If nature based solutions have to work to mitigate climate change and its effects, we need to go beyond mere tree planting and relook at these as holistic, ecosystem restoration projects that create long-lasting impact: Ecologically, economically and socially.

It is estimated that out of 329 M ha total geographical area, 120.4 M ha land in India is degraded due to deforestation, overgrazing, agriculture-related activities, and over exploitation. 41% of the total forest cover is degraded and more is being lost each year.[3] Given the limited resources government is able to allocate to restoration of India's forests, it is critical that high quality privately funded projects are activated to reclaim the country's forests.

[1] https://www.sciencedirect.com/science/article/pii/S0006320721002767#bb0020

[2] https://www.sciencedirect.com/science/article/pii/S0006320721002767#bb0235

[3] https://www.naro.affrc.go.jp/archive/niaes/marco/marco2015/text/ws3-2_m_s_aulakh.pdf

CARBON NEGATIVE

Carbon Negative is a carbon capture and ecosystem services enterprise innovating nature based solutions for sustainable development.

Carbon Negative innovates nature-based models that capture, sequester and substitute large carbon volumes while creating a chain of sustainable development opportunities.

What we do:

Learning

Research and domain expertise. Includes discovery and repository of new knowledge as well as training and dissemination.

Modelling

A multi disciplinary approach that combines diverse domains to create new circular, carbon neutral business models for specific sectors.

Proofing

Operations and execution which includes profit centres and data collection.

Advocacy

Outreach arm that includes networking with industry, government, media and social sectors.

CORPORATE CARBON CHAMPION

The Program

In order to engage the corporate sector in reclaiming India's lost forests, we have designed a program that can deliver high quality, sustainable and impactful projects that can direct CSR (Corporate Social Responsibility) and ESG (Environmental, Social, Governance) funding and efforts of responsible corporations into real and measurable results.

Working closely with Forest, Ecology and Environment Department, Government of Karnataka, we take possession of large tracts of degraded forest lands for 3 years, restore them to their original state and hand them back to the government after 3 years. These projects rely on corporate sponsorships for funding.

Program Overview

The concept of watershed management has evolved to ensure effective use of both natural and social capitals. Thus, the watershed development programmes include land, water and human resources as essential components. Our approach to afforestation on degraded forest lands take a holistic view of ecosystem restoration and is based on the following model:

The logistics of executing a project that encompasses all the various elements captured in the previous infographic requires not just meticulous planning but also careful execution. Unlike tree planting, which is a one time activity, ecosystem restoration projects are long term commitments for all the stakeholders: Project owners, sponsors and the communities where they are located.

Program Mechanics

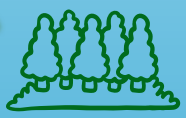
A typical project flow is executed as follows:

Preparatory phase:

- Understanding the natural systems that existed before degradation commenced is key to restoring ecosystems. Using a range of technologies and analyses, including that of existing conditions, soil, hydrological (both surface and sub-surface) and ecology surveys are done that guide the masterplanning of the watershed.
- A factor most such projects overlook is community engagement. Every piece of land, whether productive or degraded, is used by people who live in the vicinity. They depend on these lands for grazing, fuel wood and a number of resources. It is important not just to take them into confidence before undertaking these projects but also ensure that the livelihood services the land provided not cease but are enhanced. A participatory approach where local communities are not excluded from the project but are made stakeholders – including generating livelihoods - in its success is often the key to long-term success of these initiatives.
- Once the master plan is ready, the land is prepared for afforestation. This includes building water harvesting and resourcing infrastructure, soil preparation and improvement. Natural features of the land such as hillocks, valleys and water channels are taken into account to preserve and enhance the original lay of the land, especially against soil erosion by wind and water. Flood and water logging protection is also integrated in land preparation.

Execution phase:

- While planting trees is considered a simple task, a lot of work goes into choosing which species to plant where, planning shrubs, grasses and other planting materials to support both wildlife as well as human communities that inhabit and use the land. This includes ensuring fodder for grazers as well as protection of the vegetation planted.
- Several old and new systems are used to enhance the productivity and resilience of the ecosystem. For example, using clay pots for irrigating saplings is a very old technique that saves water, increases survivability and vigour of the saplings.



Maintenance phase:

- Once the vegetation is in place, the land is closely monitored to ensure that soil quality, moisture content, growth and regeneration is happening as planned. Using remote sensing technologies, a fortnightly report is generated to discover threats to the ecosystem, such as fire, human conflict, water stress and integrity of water harvesting structures such as bunds, dams and trenches.
- A detailed annual report is prepared and shared with all stakeholders, with recommendations on how to enhance and improve the ecosystem restoration process.

Reporting

To ensure that the project meets the highest global standards of quality, sustainability and impact assessment, a robust reporting program has been designed, so the sponsoring corporate partner can not only keep track of the effectiveness of its CSR investment but also reliably report it to its board and shareholders.

A detailed overview of our reporting parameters:

Survival rate: The survival rate of plantings undertaken across the project

Soil health: Monitor and report Nitrogen, Phosphorous, Potassium, PH and Organic Carbon in the soil to map improvement / deterioration

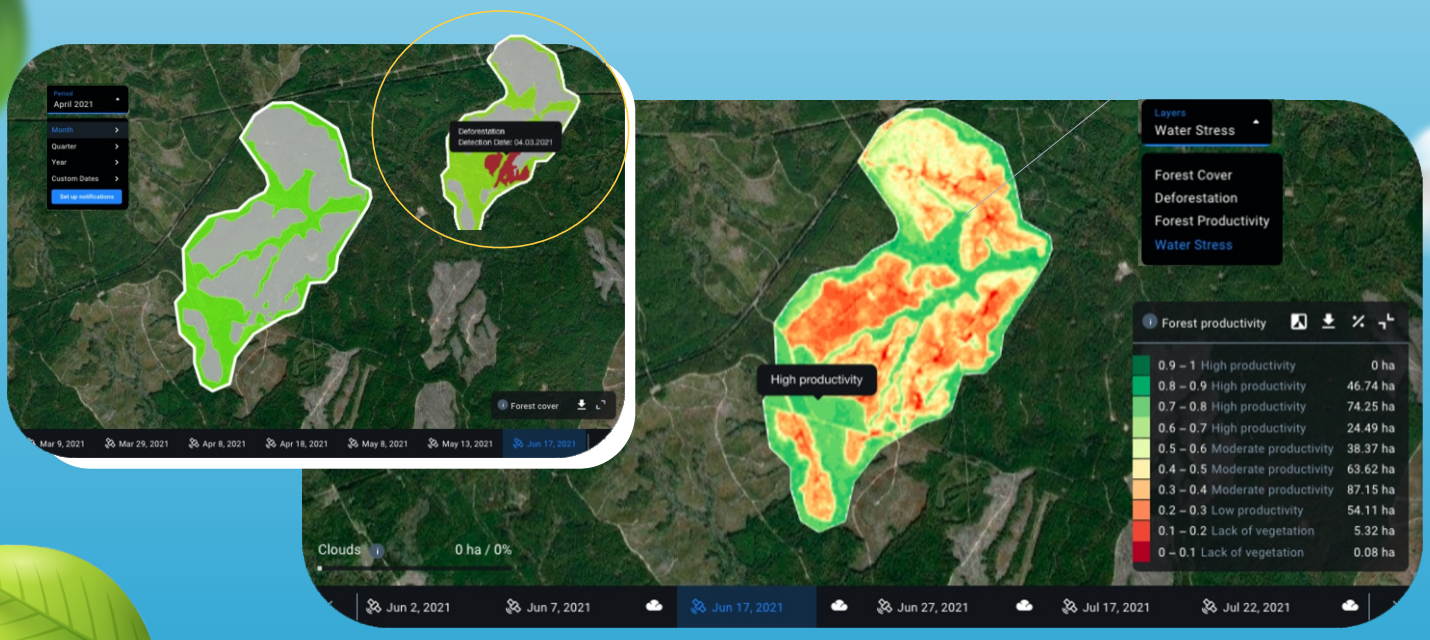
Forest cover improvement:** Detect and report tree cover (+ / -)

Climate Change / Human Impact assessment:**
- Predict the trend between forest growth and weather forecast of an area of 9KM by 9KM.
- Detect forest cover loss due to harvesting or deforestation by comparing two neighbouring months.

Livelihood generation*: Measure and report direct and indirect livelihood generation by the project.

Forest health:**
- Assess damage to forest health (forest cover / moisture content) remotely and with high precision.
- Predict forest fires using 'Abnormally High Temperature Alert Technology'.
- Monitor moisture content in plants to reduce the risk of diseases and identify water stress.

Water security:**
- Geo-Spatial mapping and analysis for ground water monitoring.
- Sub surface imaging to analyse water stress and ways to improve green cover.
- Sub surface data analysis.
- Regional analysis for block wise mapping of water availability.
- Flow track simulation.
- Run off analysis.
- Aquifer health check and environmental impact analysis to provide insights into works beneath sub surface.



**Reporting by The Ground Water Company

Investment proposal

Unlike tree planting that is a one time effort, ecosystem restoration requires a minimum of 3 year commitment and sustained effort to ensure that the project endures with minimal management thereafter. The elements of this restoration include:

Heads	Item
Land survey & preparation	Detailed soil, hydrological and ecology survey
	Masterplanning
	Execution of water harvesting infrastructure
	Borewells X 5
Planting	Pits
	Soil nutrients
	Planting material (a biodiverse mix of 250 trees, shrubs, grasses and bamboo
	Stakes
	Tree quards / fencing
Manpower	Supervisor (Rs. 5 lakhs X 3 years)
	Gardeners/maintenance staff (10 X Rs. 1.8 lakhs X 3 years)
Infrastructure	Living quarters
	Vehicle

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