

Collaborative Restoration of Degraded Agricultural Lands

Raichur District, Karnataka, India

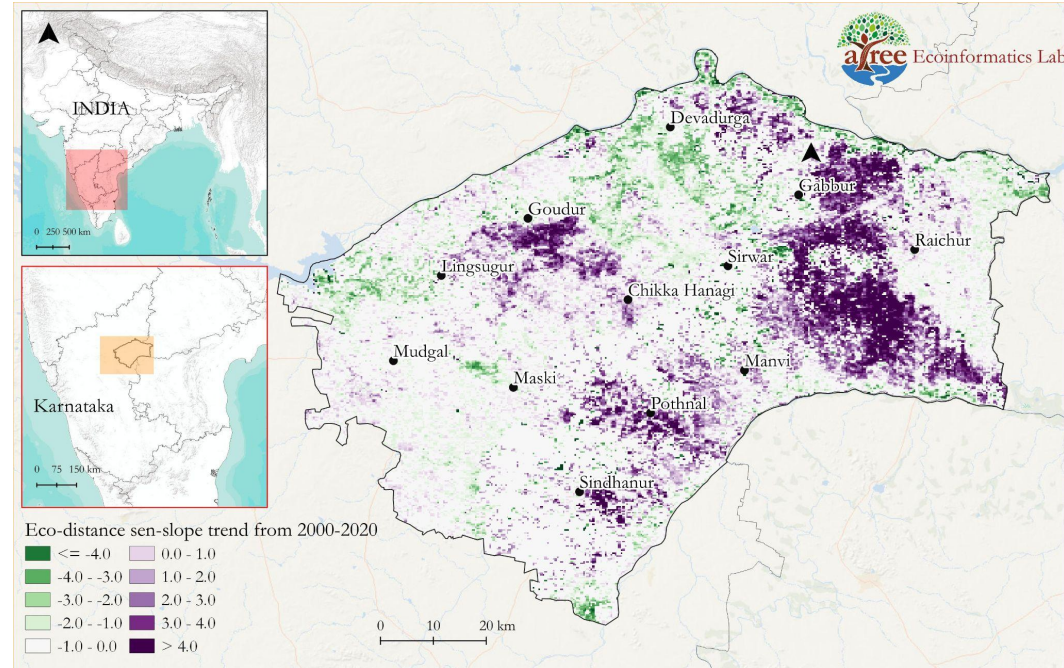
Alliance for Reversing Ecosystem Service Threats (AREST) in partnership
with Prarambha

Prepared by CSEI-ATREE for the "Investing in Landscapes: A Challenge for Finance Innovation, A Wealth of Opportunity," virtual event convened by the 1000 Landscapes for 1 Billion People initiative, Laudes Foundation and IKEA Foundation on February 22, 2023.

We found 90,000 hectares of degrading land in Raichur district of Karnataka, India

Situated in the semi-arid drought-prone landscapes of dryland India, Raichur's degrading lands call for urgent attention.

With more than 1 million people and half a million livestock depending on land-based livelihoods for subsistence, lowered land productivity impacts the most vulnerable and socio-economically disadvantaged agricultural households and pastoralist communities.



*Figure 1: The purple areas indicate browning or loss of productivity and the green patches suggest increase in vegetation which in this case was found to be an invasive called *Prosopis Juliflora*.*

Dryland agriculture and pastoralism are threatened by loss of critical ecosystem services

Raichur, Karnataka, India



Key challenges

Raichur, Karnataka, India

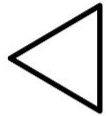


- Small-holder farmers are making losses from high input costs and inefficient land-use practices such as monoculture cropping of rice, cotton and chilly.
- Farmers are additionally burdened from loss of agricultural productivity and poor fodder availability from land degradation.
- Loss making in agriculture traps farmer households in a cycle of debt, distress migration and nutritional deficiencies, impacting their quality of life.

Our Approach is people-centric, science-based and demand-oriented



Slowing Degradation



Reversing Degradation



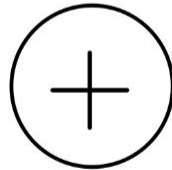
BOUQUET OF INTERVENTIONS

Demand Based

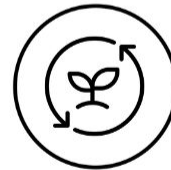


Market Links

Output

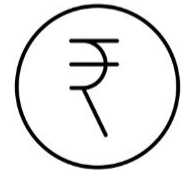


Value Addi.



Sustainable Agri.

Input



Transition Fin.

Scaling Through Institutional Arrangements

We innovate locally suitable solutions, leverage regional policies and contribute to national goals

Land Degradation Neutrality (LDN)

Commitment to the United Nations Convention to Combat Desertification (UNCCD)

Restore 26 million hectares of degraded land by 2030 to achieve land degradation neutrality.

26 Million Hectares

2.5-3 Billion tonnes

NDC3 Commitment under Paris Agreement

Create an additional carbon sink of 2.5-3 billion tonnes of CO₂ equivalent through additional forest and tree cover.



National Biodiversity Targets (NBT) under the Convention on Biological Diversity (CBD)

National Mission for Biodiversity & Human Well Being

National vision



Aatmanirbhar Bharat
Doubling Farmers Income
Job Creation



Aligns with Existing Schemes



GOALS & TARGETS

3 Ecosystems



Agricultural Lands



Riparian Habitats



Open & Natural Habitats (ONH)

Localizing SDGs through a multitude of co-benefits



Prioritised semi-arid and dry lands: highly prone to climate vulnerability



Ecosystem-based approach: for locally suitable interventions



Demand oriented interventions: based on local aspirations of end-users.



Capacity building to fill knowledge gaps: through interdisciplinary scientific rigour on land, soils and water

In Raichur, we are working to improve land-use management practices on 150Ha, scalable to 10,000Ha in peninsular India by demonstrating systematic, scientific and innovative processes

KNOWLEDGE PARTNERS



ALLIANCE FOR
REVERSING
ECOSYSTEM
SERVICE THREATS



CENTRE FOR
SOCIAL & ENVIRONMENTAL
INNOVATION



IMPLEMENTATION PARTNERS

Prarambha



CENTRE FOR
SOCIAL & ENVIRONMENTAL
INNOVATION



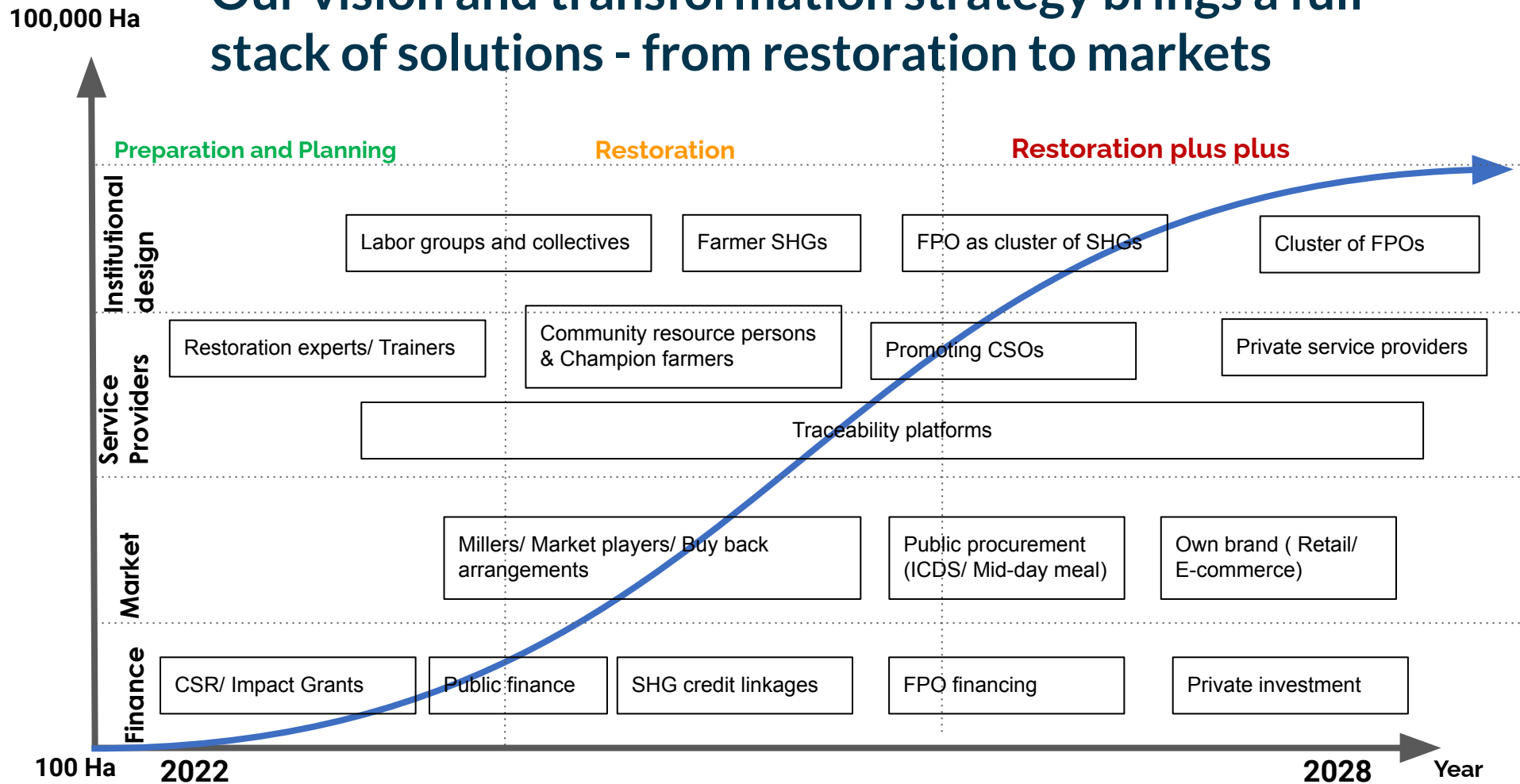
TRAINING PARTNERS

S.O.I.L Trust

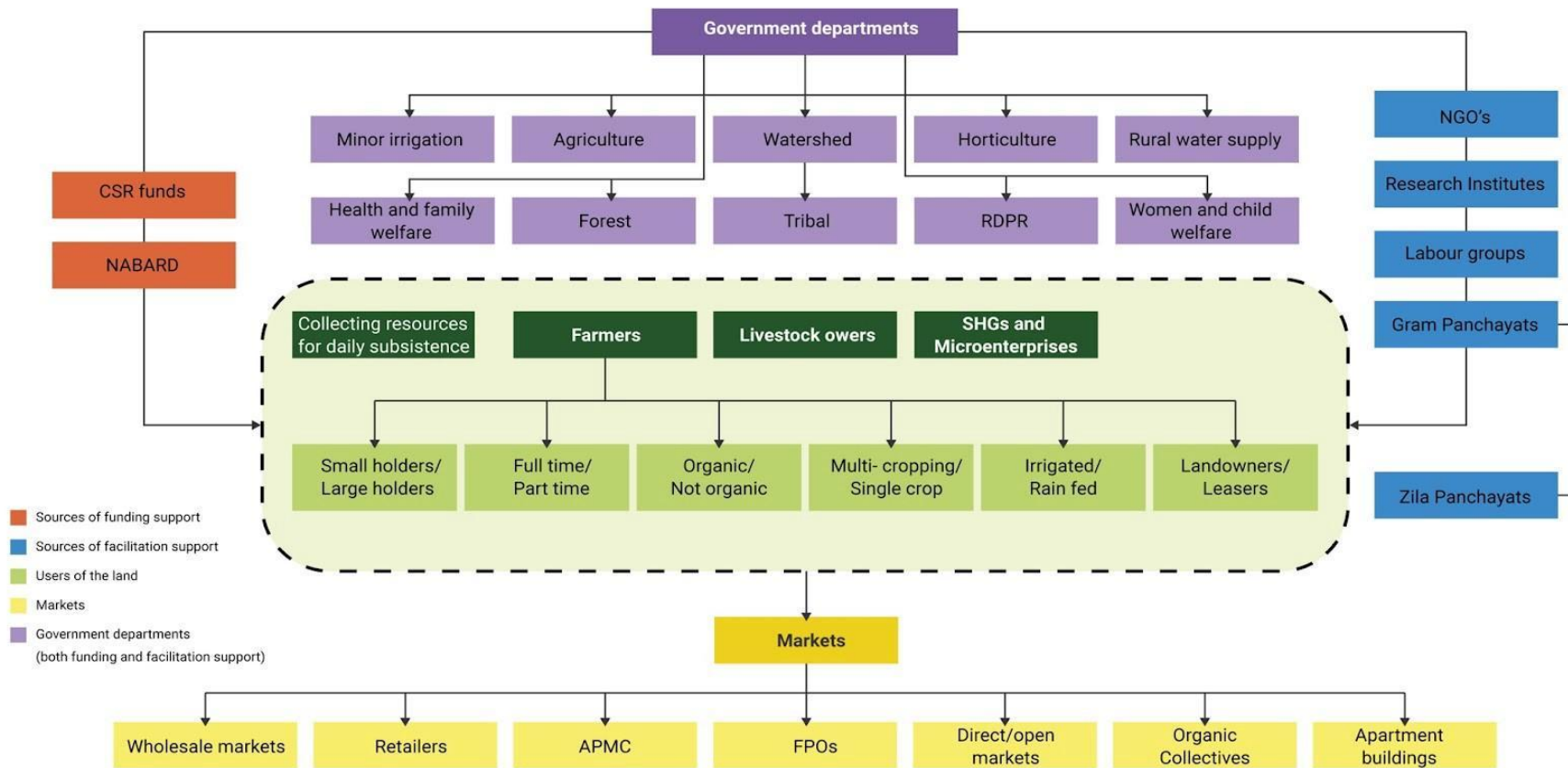


**Rainmatter
Foundation**

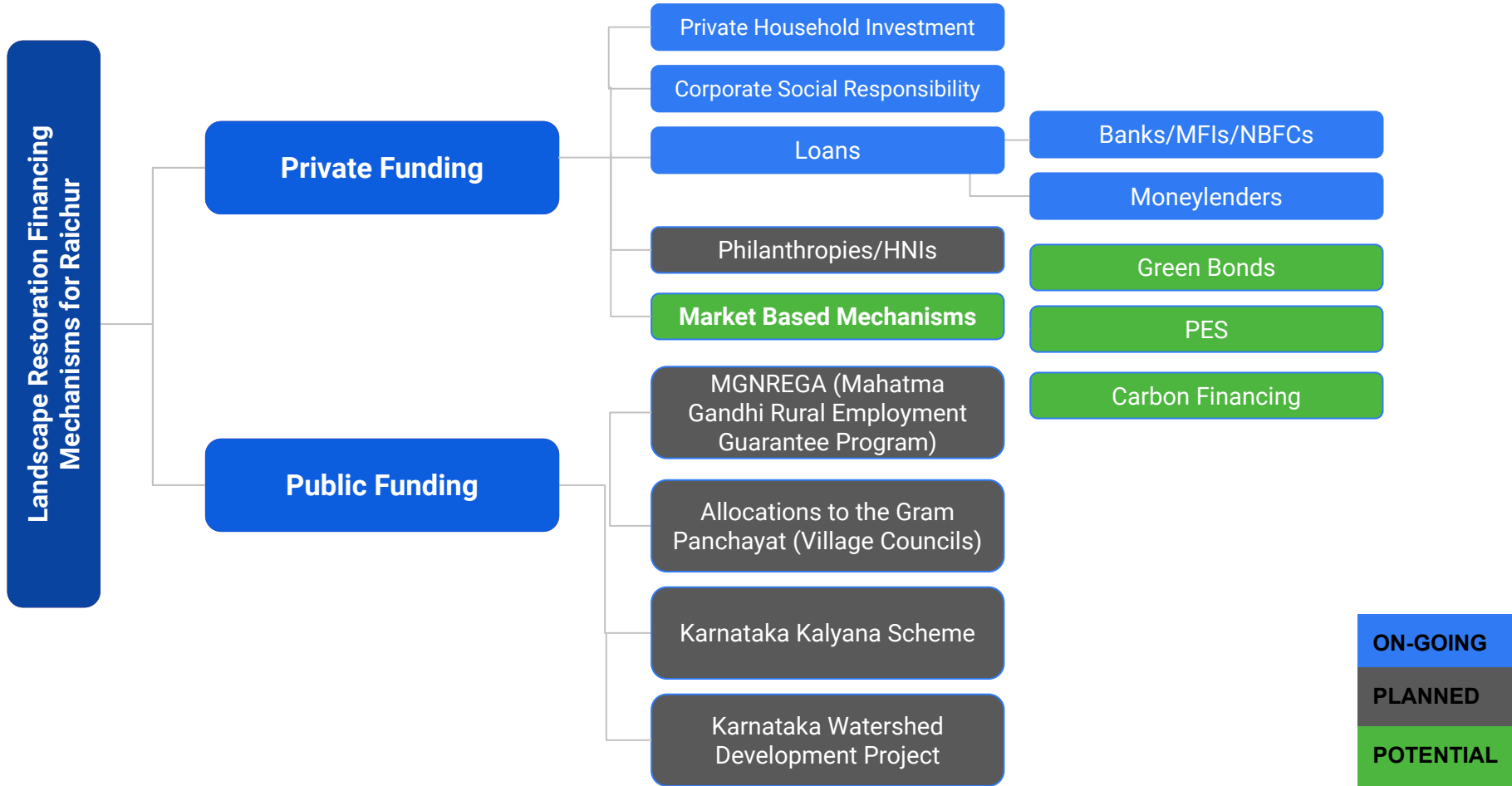
Our vision and transformation strategy brings a full stack of solutions - from restoration to markets



We Mapped the Actor-Network in Raichur



We Mapped Potential Financing Available



We co-designed a landscape action plan for creating synergies to impact at scale

Activities	Pre-sowing	Cultivation	Crop diversification	Value addition	Income diversification
Purpose	Restoration & preventing degradation	Preventing degradation and allowing soil regeneration	Allowing Soil regeneration & income diversification	Income enhancement	
Options	Removal of invasive species like Prosopis Juliflora	Conservation tillage	Intercropping	Place: Aggregation and direct market linkage	Goat/sheep rearing
	Trench-cum-bunds	Contour farming	Crop rotation	Time: Storage spaces and processes to increase product life span	Poultry
	Farm ponds and watershed management	Cover cropping	Multilayer agroforestry	Form: Conversion to useful form with higher value in the market	Agro Voltaic/ Solar irrigation
	Mulch farming	Natural farming			Carbon financing
	Green leaves manure	Organic farming			
	Vegetative hedges	Non Pesticide management			
	Pre-Monsoon Dry Sowing	Conservation agriculture			
	Reclamation and management of sodic soils	Integrated nutrient management			
Compost pits					

Public

Private

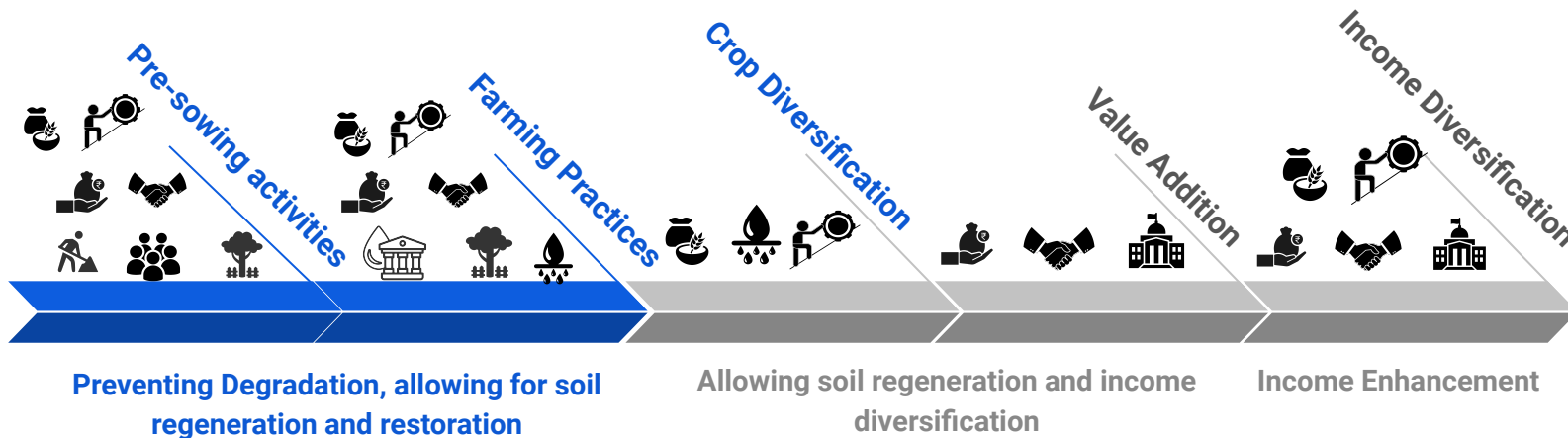
TO BE IDENTIFIED

P&P

We are leveraging existing financing options for our landscape action plans

ON-GOING

PLANNED



PUBLIC FINANCE



PRIVATE FINANCE



Our building blocks: Critical synergies among the actions

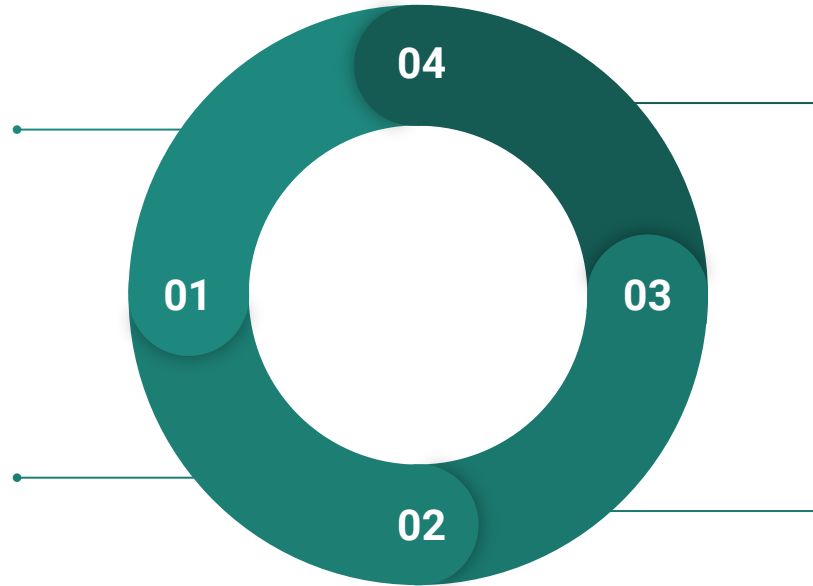
Partnerships and science-based capacity building for demonstrating restoration

Local partnerships for institution-building

Enabling local institutions through capacity building, peer-to-peer learning, facilitating extension services.

Training Farmers for Improving Soil Health

Through capacity building of farmers to bridge knowledge gaps



Science-Based M&E Framework

To ensure long-term monitoring of restoration sites, we will enable citizen-science approaches for scaling-up a science-based M&E framework for setting-up baselines.

Participatory Governance Structures

Implementation through structures which are constitutionally mandated such as BMCs, MGNREGA, Panchayats.

We envision to build a landscape investment portfolio

To unlock finance for scaling-up interventions



We estimate transition cost of INR 235,000 crore (USD 31 billion) over 6 years (USD 5 billion per year). We will develop multiple restoration scenarios for governments to help direct funds more effectively.

To stack multiple financing mechanisms to fund a pipeline of restoration projects and off-farm initiatives e.g. carbon financing, PPP financing initiatives, etc.

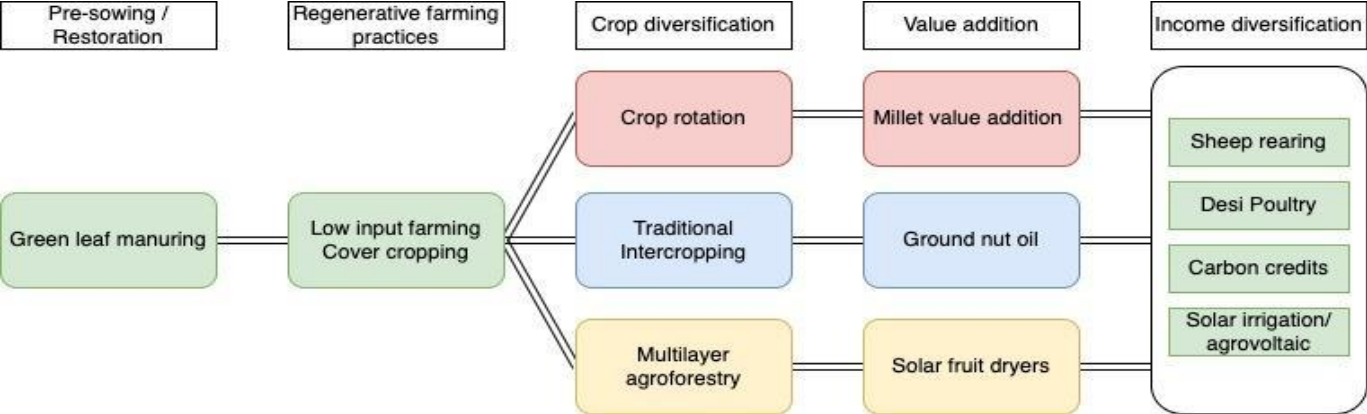
At least one special purpose landscape finance mechanism to finance these investments at scale, designed jointly with interested financial institutions. E.g. NABARD, GCF, etc.

High integrity carbon ton to ensure quality carbon credits. For this purpose, we will create a carbon credits estimation tool for different interventions.

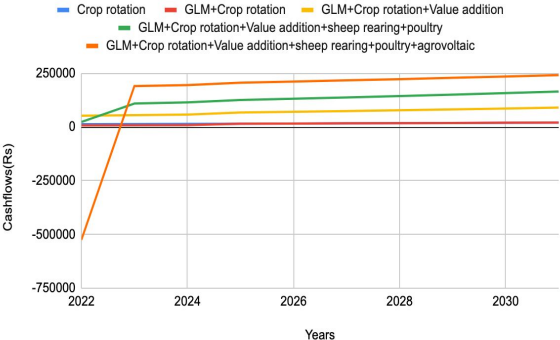
By leveraging local institutional and constitutional mandated structures



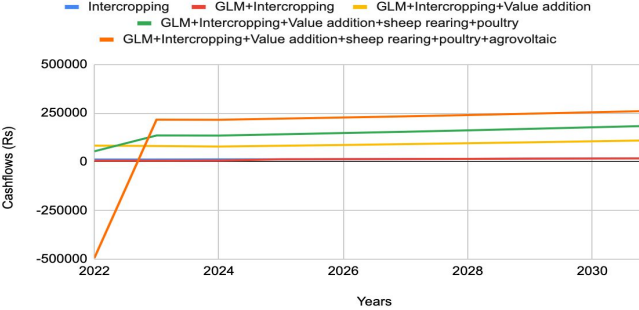
Example Interventions for Livelihood Security



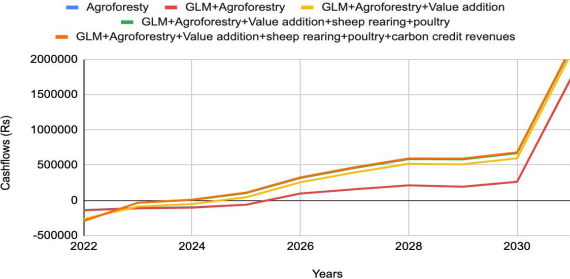
Crop rotation based intervention



Intercropping based Intervention



Agroforestry based intervention



Example Investable Business Model for Livelihood Security

Locally produced indigenous cotton with
Farm to Fabric Traceability

Business Model Canvas

KEY PARTNERS

- Small and marginal Farmers or FPOs
- Community organisations
- Value chain service providers
- Traceability platforms
- Resource persons
- Champion farmers
- Local SHGs
- Market players
- Financial institutions

KEY ACTIVITIES

- Soil restoration
- Impact measurement
- Regen agriculture
- Capacity building
- Value addition
- Income diversification

KEY RESOURCES

- Brown cotton seed license
- Community resource people
- Traditional knowledge
- Team with diverse skills

VALUE PROPOSITIONS

Farmer

- Premium prices
- Soil health improvement
- Minimal cost of cultivation

Buyer

- Farm and value chain traceability
- Niche product category in the market
- Reducing carbon and water footprints

CUSTOMER RELATIONSHIPS

- Ensuring the regular supply of quality yarn/ fabric
- Measuring and communicating impacts
- Collaboration for scale up

CHANNELS

- Procurement as a service
- Direct procurement of yarn by bulk buyers
- Traceability layered Value chain services for big retail brands

CUSTOMER SEGMENTS

- Own brand (10%)
- To textile market players - Fabric (20%)
- To textile market player - Yarn (70%)

IMPACTS (1000 hectares)

- 500+ small and marginal farmers
- 200 tonnes (3.6 L mtrs) of chemical free cotton
- 27 Lakh ltrs of water saved
- 3 Million Rs additional farmer income
- Improvement in soil health, nutrition and biodiversity

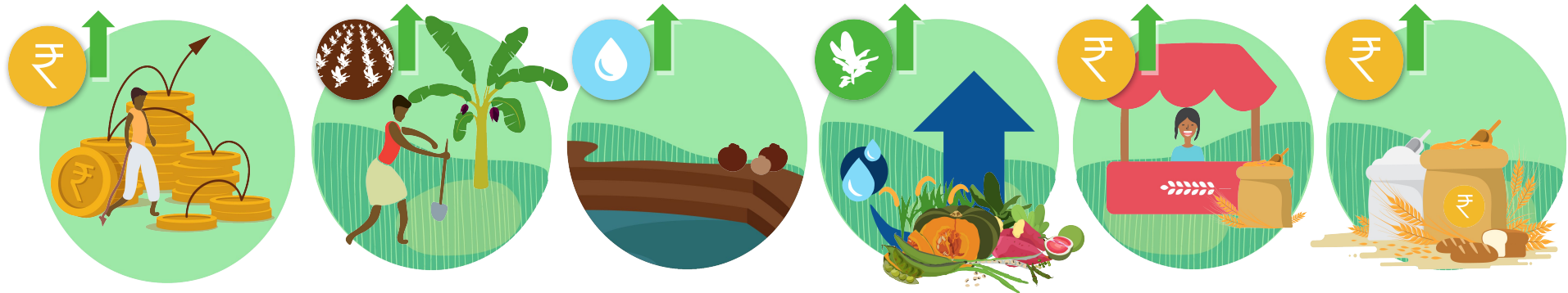
COST STRUCTURE

- Active restoration - pre-sowing activities
- Farmer Incentive for transitioning from conventional agricultural practices to regenerative agriculture
- R&D - on seeds, textiles and impacts
- Traceability platform fees and other service provider charges
- Community mobilisation and capacity building
- Value chain establishment, market linkage and logistics

REVENUE/ FINANCING STREAMS

- 30 % premium for brown cotton yarn with traceability
- Carbon credits
- Leveraging Public financing
- Impact investments
- Income diversification including livestock rearing, agro-voltaic and value chain service provisions

How we are measuring impact across interventions with different scales and goals



01

02

03

04

05

1

Cropping Choice

2

Increasing Land Productivity

3

Increasing Yields, Efficiency

4

Improving Price, Market Links

5

Increasing Value Addition

Increasing Farmer Income

Rs/Year
Rs/Year

$$= \underbrace{\text{Ha/Year} \times \text{m}^3/\text{Ha} \times \text{Kg/m}^3}_{\text{Plot scale interventions}} \underbrace{\times \text{Rs/kg} + \text{Rs/kg}}_{\text{Systemic interventions}}$$

Plot scale interventions

Systemic interventions

Current financial support

Completed

PHASE 1 – ORACLE, Hewlett & Packard and WestBridge Capital

PHASE 2 – ORACLE and WestBridge Capital

Activity 1

Set-up Monitoring and Evaluation protocol for biodiversity tracking and restoration.

Activity 3

Conduct soil testing for soil depth, SOC, bulk density, cation exchange capacity, soil PH, and available soil water capacity for pilot sites.

September

Activity 4

Conduct density mapping to establish baselines for restoration of Lantana invaded sites

Activity 5

Establishing Removal & Restoration Agreement with the vendor and necessary permissions with the forest department

Activity 7

Design and implement an aspirations study

Activity 7

Co-design interventions on degraded lands with local stakeholder participation and deliver a land use management plan for the landscape.

November

Activity 6

Co-design and facilitate focused group discussions with local communities to identify the best possible interventions on degraded lands via journey mapping exercises.

Activity 8

Identify institutional models for implementing rural livelihood diversification projects with partners.

Activity 9

Identify public-private partners to set-up pilots for rural livelihood diversification based on the economic and business feasibility models for at least 3 types of interventions.

January

Activity 10

Conduct farmer trainings and local capacity building

February'23

July'22

August

October

December

Activity 2

Create a baseline and land-use and land-cover map to monitor restoration and biodiversity prepping for removal and restoration

November

December

January

February'23

For \$1 invested, we will unlock \$4 of public funding



- We are unlocking public financing options such as MGNREGA (a rural employment guarantee programme) to fund local interventions through convergence of multiple schemes.

Risks and de-risking investments/activities

RISK	RISK MITIGATION	THREAT
Climate: Extreme weather and erratic wet and dry spells	Capacity building for climate resilient land-use practices and livelihood diversification strategies	High
Transition/Inertia: To shift behavioural practices requires community engagement and mobilisation	Formation of informal institutional structures to act as peer groups to support the transition.	Medium
Financial: The cost of transition financing remains unmet	Leveraging private financing to unlock public funding and vice-versa, thus innovating and reducing risks through a plethora of financing mechanisms.	High
Adoption: Restoration is a slow and dynamic process	Innovative, scientific and systematic processes that are locally suitable	Low
Market Access: Uncertainty about markets impacts farmers crop choices and land-use practices	Livelihood diversification strategy to improve sources of income.	High

Financing needs

- Our most critical financing need is to support local partners for their operational costs and a kick-start fund to initiate implementation since the flow of public finances to restoration interventions may not follow a precise and specific schedule.
- Core funds to support M&E in the transition from a state of degradation to a state restoration using a systematic science-based demand oriented approach.
- Private investments in value-addition and building supply chains for crop diversified and restored landscapes.

Landscape investment: lessons learned

1. These are **long-term gestation projects**. Therefore, a variety of financing is critical to disperse risk and insulate local people from the uncertainty of a project-based approach.
2. **Less visibility of impacts** in the initial years and support for on-the-ground cost-effective activities e.g. green manuring, is limited with depleting remuneration in agriculture and lack of bio-resources in degraded lands.
3. There is a need for **convergence of funds** through multiple sources and departments to make the programmes more viable and we believe this is achievable when restoration is adopted as a demand-based approach couple with appropriate and suitable supply-side interventions

For More Information

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