Solar Power Developers Association

GROW FOREST MECHANISM

SPDA- INTRODUCTION

CHANGING CLIMATIC CONDITION

CONCEPT – GROW FOREST MECHANISM

SUPPORT FROM GOVT.

About SPDA

- SPDA is an independent industry association with more than 50-member companies from the solar, wind sector providing their assistance in policy evolution and a healthier investment climate for renewable energy projects and services.

- We provide a neutral platform for policy advocacy, discussions and examination of critical issues to the development of the Clean energy transition and our efforts are well recognized by Central and State Ministries.

- Our initiatives are focused on policy, strategic, financial, legal, regulatory and technical issues in the energy sectors.

- SPDA members include all kinds of players who have actively contributed with more than 75% of total capacity operation in India.

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India and Climate Change

- India is one of the fastest growing economies in the world.
- Climate change is primarily caused by building up of green house gases (GHG), due to fossil fuel, land use change and anthropogenic activity
- Nearly 70% of infrastructural growth is powered by coal.
- Climate change is accompanied by : High average temperature, Changed rainfall patterns, Increased severity and frequency of floods, droughts and cyclones, Oceanic acidification
- Effects of Climate Change are being felt all over the country.
- Erratic monsoons pattern will have serious effect on agriculture and water supply.
- One degree Celsius rise in temperature can cause wheat production to decrease by 4-5 million tones.

It is time to move towards low carbon emitting economy.

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Forest Cover – Reality Check

Forest resource accounting variable	ISFR 2003	ISFR 2005	ISFR 2009	ISFR 2011	ISFR 2013	ISFR 2015	ISFR 2017	Net Change between 2003 to 2017	% change between 2003 to 2017
Forest Cover (in square kilometer)	686,767	692,027	690,899	692,027	697,898	701,673	708,273	21506	**3.13**
Growing Stock in Forests (million cubic	4781.41	4602.04	4498.70	4498.73	4173.36	4195.05	4218.38	-563.03	**-11.78**

- Reduction in growing stock (-11.78%) despite increasing forest cover (3.13%) is an indicator of forest degradation
- Within the recorded forest, 94.96% of forest is prone to crop injuries, 39.94 percent has inadequate regeneration, and 5.05 percent has no regeneration
- Forest degradation directly impacts sequestration of GHGs and enhances emission

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Source: FSI – Technical Information Series, 2019

Existing Framework of Policies, Acts & Rules and Programmes for increasing Carbon Sink through Forest and Tree Cover in the Country: The Business as Usual (BAU) Scenario

- Indian Forest Act, 1927
- Wildlife protection Act, 1972
- National Forest Policy, 1988
- Forest Conservation Act, 1980
- Central and State sponsored Schemes
    - **Green India Mission (GIM)**
    - National Afforestation Programme (NAP)
    - **CAMPA**
    - MGNREGA
    - Green Highway Policy, 2015
    - Policy for enhancement of Urban Greens
    - National Agro-forestry Policy and Sub-Mission on Agro-forestry (SMAF)
    - National Bamboo Mission
    - National Mission for Sustainable Agriculture
    - State Funded schemes

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Grow Forest Mechanism - One of the best possible solution for achieving India's nationally determined contribution of creating an additional carbon sink of 2.5 to 3 billion tonnes of CO2 Eq through additional forest & tree cover by 2030

- This ambitious target requires a well-planned strategy taking into consideration all possible interventions within the forests and all other available lands
- Largest potential of creating additional carbon sink lies in restoration of forests which have impaired in the last 15 to 20 years.
- Restoration of natural forests contribute up to 60% of the total carbon sink which can be achieved by 2030
- NDC target of creating additional carbon sink through additional forest & tree cover may be seen as an opportunity to enhance forestry sector in the country
- Creating Green Banks and tradable forest certificates
- GFC is a PPCP based forest cover enhancing instrument

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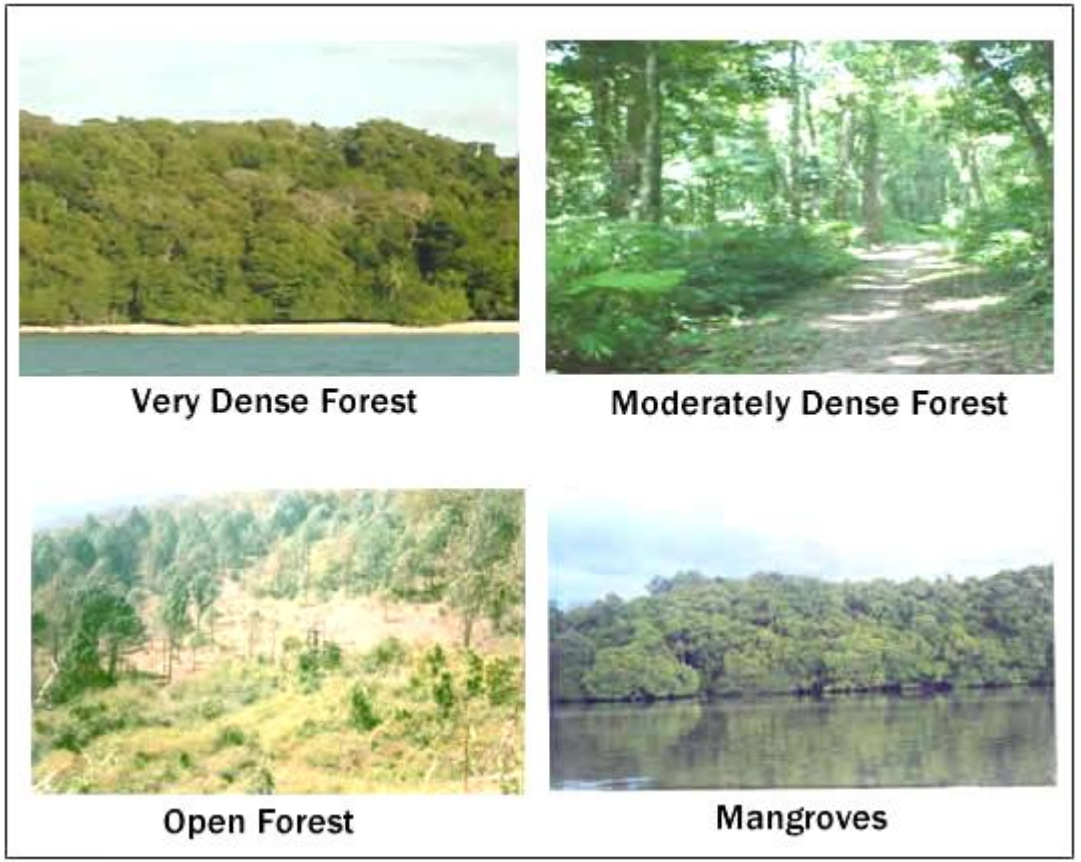
Grow Forest Mechanism - The activities which may be included in the Strategy for creating additional carbon sink of 2.5 to 3.0 billion tonnes through additional forest & tree Cover by 2030

- Restoration of Impaired Forests
- Restoration of Open Forests
- Afforestation on Wastelands
- Agro- forestry
- Green Corridor along NH & SH
- Plantations along Rivers and Canal
- Urban Green Spaces



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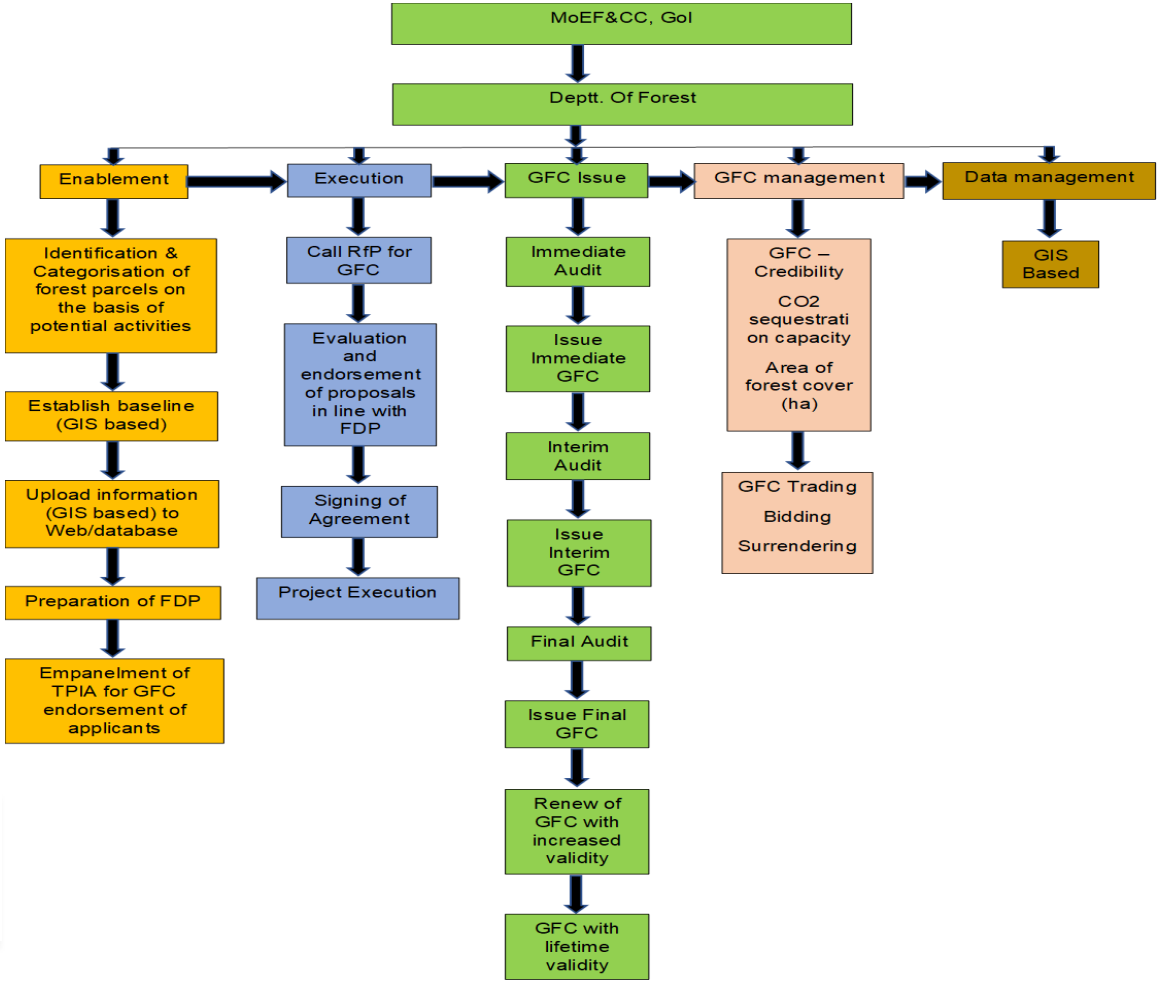
Grow Forest Certificates - Mechanism



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Benefits (1/2)

- ✓ GFC can be an ideal mechanism for regeneration of degraded forest.
- ✓ It will provide the economic incentive to increase forest cover.
- ✓ Enhance correct forest cover accounting thus bringing in transparency.
- ✓ Prevalent mechanisms have not been very successful, but GFC can be successfully used for carbon financing and hence climate change mitigation, thus contributing to sustainable growth.
- ✓ This will encourage private sector to undertake forestry on a long-term basis and will mitigate the compliance risk that many infrastructure projects are facing.

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Benefits (2/2)

- Economic incentivization of private sector for investing in forest
  - Execution efficiencies
  - Independent verification
  - Establishing marketplace – enabler for continuous investment
  - Sustainability of practices

- Employment and revenue generation potential
  - Community involvement in economic activities – Panchayats, local population
  - Social forest entrepreneurship development
  - Private investment of Rs. 20000 Crores @2 lakhs/acre
  - Direct and indirect tax benefits to government (no investment)
  - Forest produce to benefit local population

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Stakeholders

- Government ministries / designated agencies
- Private investors and project management agencies
- Local government officials from revenue, forest, water and other departments
- Local population, NGOs, Panchayats (grass root level participative administrative bodies)
- Independent validators, auditors, monitoring agencies
- GFC and related data managing organizations
- Commodities exchanges

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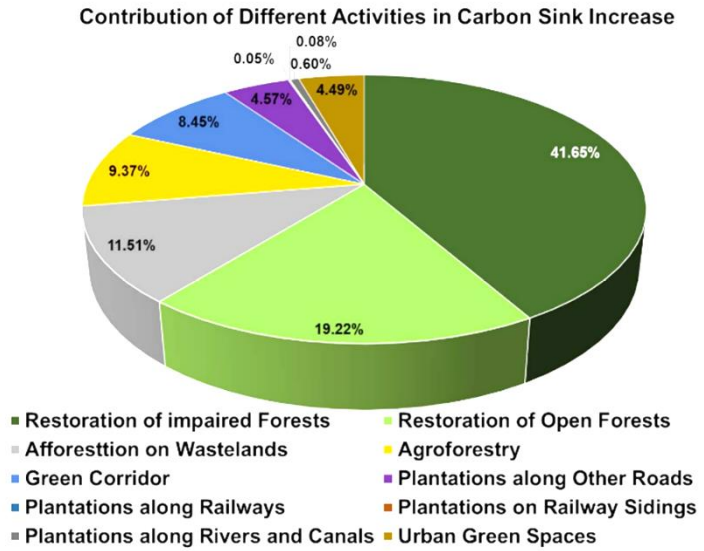
Potential Area Available for Different Activities

Sl No.	Activities	Area in million ha
1	Restoration of Forests impaired in the last 6 years	13.7
2	Restoring Open Forests of more than 6 years vintage to MDF	18.9
3	Plantations on Culturable Wastelands	12.5
4	Agro-forestry Plantations	13.7
5	Green Corridor along National and State	1.40
6	Plantations along Other Roads	2.89
7	Plantations along Railway Tracks	0.07
8	Plantations around Railway Sidings	0.01
9	Plantation along Important Rivers and Canals	0.39
10	Expanding Urban Green Spaces and Avenue Plantations	12.2
Total Area		**75.8**



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Support from Govt of India

- The concept can be included under Green India Mission (GIM) or CAMPA under National Action Plan on Climate Change (NAPCC).

- Enabling legal and regulatory framework to allow private sector to work on degraded forest either on ownership or right-to-use basis.

- Enabling legal framework to allow GFC to be accepted as compensatory forest in infrastructure projects.

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THANK YOU !!!

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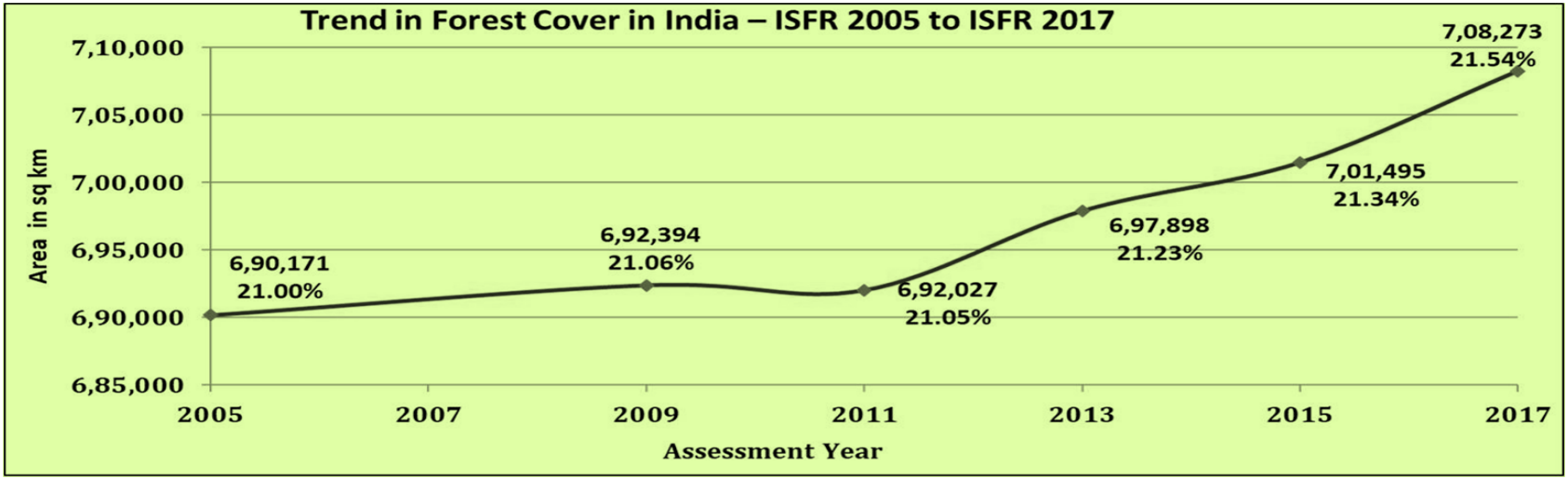
Forest Cover – Reality Check



Source: FSI – Technical Information Series, 2019

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Potential Increase in Carbon Sink and Forest Cover

Activities	Scenario 1			Scenario 2			Scenario 3		
	CO2 eq (billion tonnes)	Area (Ha)	% Gain in Forest Cover (w.r.t. TGA)	CO2 eq (billion tonnes)	Area (Ha)	% Gain in Forest Cover (w.r.t. TGA)	CO2 eq (billion tonnes)	Area (Ha)	% Gain in Forest Cover (w.r.t. TGA)
Restoration of impaired Forests	0.68	68,71,341	1.17	0.82	82,45,609	1.40	0.95	96,19,877	**1.63**
Restoration of Open Forests	0.31	18,89,989	0.00	0.63	37,79,978	0.00	0.94	56,69,967	**0.00**
Afforestation on Wastelands	0.19	12,46,948	0.38	0.38	24,93,896	0.76	0.56	37,40,844	**1.14**
Agroforestry	0.15	13,73,200	0.42	0.23	20,59,800	0.63	0.31	27,46,400	**0.84**
Green Corridor	0.14	4,20,000	0.13	0.18	5,60,000	0.17	0.23	7,00,000	**0.21**
Plantations along Other Roads	0.075	5,78,909	0.18	0.11	8,68,363	0.26	0.15	11,57,817	**0.35**
Plantations along Railways	0.00084	6,669	0.002	0.0017	13,337	0.0041	0.0025	20,006	**0.0061**
Plantations on Railway Sidings	0.0012	5,154	0.0016	0.0012	5,154	0.0016	0.0012	5,154	**0.0016**
Plantations along Rivers and Canals	0.0098	39,042	0.012	0.02	78,084	0.024	0.029	1,17,126	**0.036**
Urban Green Spaces	0.073	3,04,799	0.093	0.15	6,09,599	0.19	0.22	9,14,398	**0.28**
Total National Level CO2 eq (Bt) upto year 2030	**1.63**	**1,27,36,051**	**2.38**	**2.51**	**1,87,13,821**	**3.43**	**3.39**	**2,46,91,590**	**4.49**

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Indicative scenarios of increasing the carbon sink size by 2030

Scenario 1			Scenario 2			Scenario 3		
Increase in Carbon Sink CO2 eq (billion tonnes)	Resulting increase in Area of Forest & Tree Cover (million ha)	Cost (in lakh crores INR)	Increase in Carbon Sink CO2 eq (billion tonnes)	Resulting increase in Area of Forest & Tree Cover (million ha)	Cost (in lakh crores INR)	Increase in Carbon Sink CO2 eq (billion tonnes)	Resulting increase in Area of Forest & Tree Cover (million ha)	Cost (in lakh crores INR)
1.63	12.73 (2.38% of GA)	1.14	2.51	18.71 (3.43% of GA)	1.92	3.39	24.69 (4.49% of GA)	2.46

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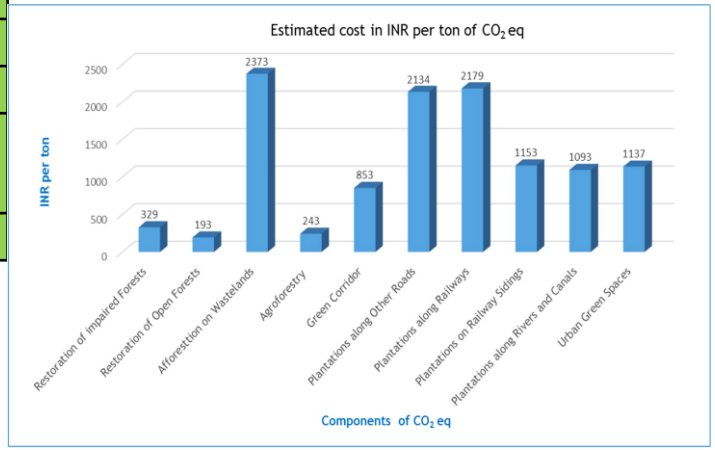
Unit Cost and Carbon Sink per unit Area for different Activities

Sl No	Activities for Increasing Forest & Tree Cover	Cost (in INR per tonne CO2 eq)	Additional Sink (in tonne CO2 eq per ha)
1	Restoration of Impaired Forests	329	98.88
2	Restoration of Open Forests	193	165.91
3	Afforestation on Wastelands	2,373	150.59
4	Agroforestry	243	111.30
5	Green Corridor along NH & SH	853	328.19
6	Plantations along Other Roads	2,134	128.88
7	Plantations along Railways	2,179	126.41
8	Plantations on Railway Sidings	1,153	239.04
9	Plantations along Rivers and Canals	1,093	250.19
10	Urban Green Spaces	1,137	240.27



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Adopted Cost Model as per CAMPA (2016)

Sl No	Model	Average Rain fall (mm)	Cost (IN R / Ha)
1	Model 1: Rate Structure of Planting Tree Species >1200 mm rainfall	>1200 mm	295 104
2	Model 2: Rate Structure of Planting Tree Species 1200-800 mm rainfall	1200 - 800 mm	214 690
3	Model 3: Rate Structure of Planting Tree Species up to 800 mm rainfall with tree spacing of 3.0 m X 3.0 m, with number of seedlings of 1111 per ha	799 - 650 mm	251 257
4	Model 4: Rate Structure of Planting Tree Species up to 650 mm rainfall with tree spacing of 4.0 m X 4.0 m, with number of seedlings 625 per ha	649 - 500 mm	139 457
5	**Model 5: Rate Structure of Planting Tree Species less than 500 mm rainfall, with intensive irrigation**	**< 500 mm**	**538 043**

** Cost norm for restoration of Impaired/ Open Forests has been taken from NAEB, MoEF&CC, which is INR 32,500/- per ha on an average.*

*** Cost norm for Plantation along NH & SH for making green corridor has been taken from NHAI, GoI, which is INR 2,80,000/- per ha on an average.*

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