

Why Transform Nilgiris into a Carbon Neutral and Climate Resilient Hub?

- Preserving Biodiversity
- Empowering Communities
- Climate Proofing



DISTRICT HIGHLIGHTS



900–2,636 m
Above mean sea level



3,500
Plant species



Indigenous tribes
Toda, Kota, Kurumba, Badaga, Irulas etc.

3 Rivers
Bhavani, Moyar, and Pykara



5520 sq kms
Nilgiris Biosphere Reserve



42,324 Tonnes
Annual tea production (2023-24)



3 key economic sectors
Tourism, horticulture, tea industry



CLIMATE PROFILE

1,609 mm Annual rainfall
1.2°C – 29.7°C
Annual temperature range



0.9°C to 3.5°C
Projected increase in maximum summer temperature by 2090



23% - 46%
Projected increase in south-west monsoon rainfall by 2090



Highly vulnerable to landslides & susceptible to forest fires



GHG EMISSIONS (2022)

Carbon neutral
Already achieved in electricity



334 ktCO₂e Gross emissions



43% Road transport
20% Residential energy
10% Domestic wastewater
Key contributors (% of gross emissions)



11 ktCO₂e Net emissions
(-323) ktCO₂e Annual sequestration



TRANSFORMATION POTENTIAL

One of the 1st
Carbon neutral hubs in India before 2030



276 ktCO₂e
Annual mitigation potential by 2050



(-498) ktCO₂e
Annual sequestration potential by 2050



Enhanced Forest Cover
Leading to minimised landslides risk



Carbon Credit-based Financing



Sustainable Tourism
Attracting global recognition



Low-Carbon Interventions and Ecosystem-Livelihood Co-benefits



Blue-Green Ecosystem

-498 ktCO₂e*

Intervention

- Shola restoration
- Enhance the carbon stock density of existing forest cover
- Agroforestry in waste/fallow lands

Resilience & Co-benefits

- Reduces flash floods, landslides, fires
- Improves air, water & soil

Economics and Livelihood Improvement

- Supports eco-tourism & green jobs
- Reduced loss & damage
- Empowers indigenous communities
- Builds community stewardship



Agri and Tea Industry

103 ktCO₂e*

Intervention

- Replace 80% fuelwood heaters in tea industry
- Shift 2,000 diesel pumps to solar by 2030
- Use 75% organic fertiliser & 25% nano urea

Resilience & Co-benefits

- Boosts energy access, health & savings
- Increases soil & crop resilience
- Improves air, water & soil

Economics and Livelihood Improvement

- Improved efficiency & operational performance
- Minimised supply chain disruption
- Self resilient farming community



Low-Carbon Mobility

80 ktCO₂e* + unquantified (PBS)

Intervention

- Transition to EVs (2W, 3W, 4W, buses)
- NMT & PBS infrastructure

Resilience & Co-benefits

- Resilient transport access
- Cooler cities
- Cleaner air

Economics and Livelihood Improvement

- Boost ecotourism
- Green jobs, especially for women
- Better health, last-mile access

*The values refers to mitigation potential
NMT: Non-motorised transport; PBS: Public bike sharing

What Does Climate-Resilient Development Deliver?

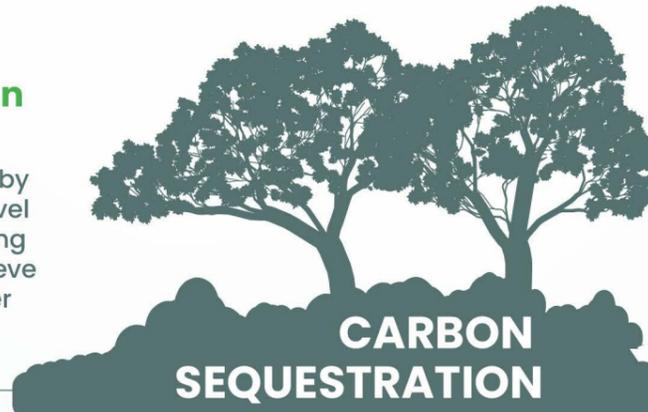
- Enhanced adaptive capacity of the town/community
- Improved thermal comfort and climate-resilient living conditions
- Reduced health risks from heat, waterborne, and vector diseases
- Enhanced community capacity to withstand climate shocks
- Inclusive action benefiting indigenous and vulnerable groups
- Ecosystem restoration reducing disaster risks (e.g., landslides)
- Lowered human-wildlife conflict through habitat-sensitive planning
- Bankable green projects | Access to global climate finance | Green jobs | Livelihood security | Savings from energy transition & efficiency | Offset infrastructure expansion

NILGIRIS DECARBONISATION ACTION PLAN

Nilgiris has the potential to become carbon neutral well before 2030

The gross GHG emissions are expected to reach 383 ktCO₂e by 2030, and subsequently 448 ktCO₂e by 2050 from current level of 334 ktCO₂e in 2022. However, the net emissions, considering the sequestration, in 2022 are 11 ktCO₂e. It could further achieve a net negative of 362 ktCO₂e under AES and 162 ktCO₂e under MES by 2050 - serving as a model and catalyst for other districts in Tamil Nadu.

AES - Aggressive Effort Scenario | MES - Moderate Effort Scenario



Promoting Social & Agroforestry in Barren/Fallow Lands

Repurposing **7276 ha** of barren/fallow land for horticulture and agro/social forestry can abate **~10 ktCO₂e by 2030 and ~64 ktCO₂e by 2050.**

Enhancing Carbon Stock Density

Enhancing the carbon stock density (CSD) by **6%**, from **~96 t/ha to 102 t/ha (2015 baseline)**, can sequester **94 ktCO₂e annually by 2030 and 104 ktCO₂e by 2050** through reforestation and afforestation and implementing sustainable forest management practices.

497 ktCO₂e
(112% of gross emissions by 2050)

Restoration of Shola Grassland

in degraded grasslands & additionally **56.4 km² of cultivable wasteland** by reviving resilient native grass species that thrive amidst invasive pressures can sequester **2 ktCO₂e by 2030 and 7 ktCO₂e by 2050.** Eg. *Andropogon lividus* and *Eulalia phaeothrix*



From the perspective of electricity generation and consumption, **Nilgiris is already carbon neutral**, its **hydroelectric** capacity stands at **830 MW generating ~2200 GWh** electricity annually.



Electricity consumption expected to rise to **711-865 GWh in 2050**, growing twofold from the current level. However, the **generation from the clean sources will remain higher than the consumption.**



Holistic assessment of **solar rooftop, floating Solar**, and other **DRE sources** needed on priority.



Efficiency and Conservation

Mandate retrofits for hotels and public buildings, including **energy-efficient heating, electrification of firewood-based heating and LED lighting.**



Diesel Generator Phase-out

Transition to hybrid solar-battery systems in hotels and commercial establishments can save **~5.2 TMT diesel.**



Energy Efficiency

Promote **5-star appliances with govt backed schemes like EEFPP and SEEP.** High-efficiency appliances and lighting in homes and commercial buildings can save **~48 GWh electricity in buildings.**



Clean Cooking Transition

Shifting **~50% of households** cooking from LPG to induction cooktops; and **100% cooking demand in commercial** hotels and institutions can abate.



55 ktCO₂e (12% of gross emissions) + 279 ktCO₂e (Scope 2) GHG emissions in buildings sector by 2050.

Electrification of Road Transport

EV penetration as % of new vehicle sales



Two/three-wheelers
70% by 2030
100% by 2050



Four-wheelers
30% by 2030
70% by 2050



Buses
20% by 2030
50% by 2050



86 ktCO₂e
(19% of gross emissions)
GHG emissions can be abated by 2050 through electrification.



Prioritise addition of **intra-district E-buses** to cater tourist demand.



Non-motorised transport, build cycle lanes, public bike-sharing, and pedestrian-friendly walking lanes.



Public charging stations, set up 5 charging stations on petrol pumps, and another 5 in optimal positions near bus depots.

Electrification of Pumping and Agro Machinery



Replace 100% of diesel pumps i.e. **~1,120 with decentralised solar pumps** under the PM KUSUM by 2030 and a total of 2000 solar pumps by 2050.



Reduce diesel use in farming; exploring the possibility of replacing diesel tractors and tillers with EVs in a long term.



~11 ktCO₂e
(2% of gross emissions)

GHG emissions can be abated by switching to solar pumps and electric tractors by 2050.



Fertiliser Shift

Replacing **75%** of nitrogen fertiliser and urea with **organic fertiliser and nano-urea** by 2050.



Agriculture soils emission abated by **54 ktCO₂e (12% of gross emissions).**



Fuel Switching



Shifting from fuel oil/firewood to electricity can help abate **~38 ktCO₂e (8% of gross emissions)** industry GHG emissions by 2050.



By 2030
Rooftop solar & electric air heaters at Indcoserve's Kaikatty Tea Factory.

By 2050

Fully decarbonise tea production with electric air heaters & captive solar.



Mandate **Zero discharge policy** in all industrial areas.



Waste Management



Improved waste treatment can help abate **32 ktCO₂e (7% of gross emissions)** GHG emissions by 2050.



45 MLD centralised wastewater treatment is recommended for urban centers, twin-pit septic tanks and **FSTPs** are recommended at gram p anchayat clusters for rural areas.