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MAGAZINE NOTES

Bee Corridors Along National Highways: NHAI's Ecological Innovation

1 March 2026 ·

ENVIRONMENT

SCIENCE & TECH

GS3

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Bee Corridors Along National Highways: NHAI's Ecological Innovation

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Source: New India Samachar, Vol. 6, Issue 18 (March 16–31, 2026) | newindiasamachar.pib.gov.in

NHAI is transforming India’s highway margins from ornamental landscaping into **ecological corridors for pollinators** — planting 4 million bee-friendly trees and shrubs by 2026-27 along national highways to support biodiversity, food security, and farmer incomes.

THE INITIATIVE

Implementing Agency: National Highways Authority of India (NHAI), under Ministry of Road Transport and Highways

Core Idea: Replace ornamental roadside plantations with **native, bee-forage species** — flowering trees and plants that provide year-round nectar and pollen for honeybees and other pollinators.

TARGET	VALUE
Trees to be planted by 2026-27	~40 lakh (4 million)
Share under bee corridor initiative	~60% of all NHAI plantations
Existing national highway network	1,46,204 km

NATIVE SPECIES USED

SPECIES	LOCAL NAME	WHY CHOSEN
<i>Azadirachta indica</i>	Neem	Year-round flowering; drought-resistant
<i>Pongamia pinnata</i>	Karanj	Nitrogen-fixing; biofuel potential
<i>Madhuca longifolia</i>	Mahua	Critical tribal livelihood tree; spring flowers
<i>Butea monosperma</i>	Palash / Flame of the Forest	Prolific spring bloomer; also a dye source
<i>Callistemon</i> spp.	Bottle Brush	Long flowering season
<i>Syzygium cumini</i>	Jamun	Summer fruiting; edible for humans and birds
<i>Albizia lebbek</i>	Siris	Fast-growing; shade + pollinator support

All species are native or naturalised to India — avoiding the invasive species trap (e.g., *Prosopis juliflora* which has devastated ecosystems after being planted in roadside programmes).

WHY POLLINATORS MATTER

Ecological Significance:

- 75% of the world's food crops depend on animal pollinators (FAO)
- Bees contribute an estimated **\$577 billion/year** globally in crop pollination services
- India: ~50% of horticultural output depends on bee pollination

Pollinator Decline — Causes:

- Habitat loss (monoculture agriculture, urbanisation)
- Pesticide use (neonicotinoids particularly harmful)
- Climate change (alters flowering times vs. pollinator emergence timing)
- Disease (Varroa mite destroying honeybee colonies globally)

India-Specific:

- Honeybee population declining in Indo-Gangetic Plain (pesticide use)
- Traditional bee forage habitats (sacred groves, scrublands) shrinking
- Bee corridors along 1.46 lakh km of highways create a **linear habitat network** across the country

CONNECTION TO APICULTURE (BEE FARMING)

- **National Beekeeping & Honey Mission (NBHM):** ₹500 crore; 20 lakh bee colonies; target 1.25 lakh metric tonnes honey/year
- Bee corridors provide natural forage → reduces cost of maintaining bee colonies
- Supports tribal and rural apiculture livelihoods
- India is the **8th largest honey producer** globally; target to be among top 3

ENVIRONMENTAL CO-BENEFITS

BENEFIT	MECHANISM
Carbon sequestration	Native trees store more carbon than ornamentals
Soil stabilisation	Deep-root species prevent highway embankment erosion
Stormwater management	Vegetation absorbs runoff, reduces flooding
Urban heat island mitigation	Green corridors lower road-side temperatures
Wildlife movement	Linear green patches aid small mammal and bird movement

UPSC RELEVANCE

GS3 — Environment & Ecology:

- Pollinators as ecosystem services providers (provisioning + supporting services)
- Biodiversity conservation outside protected areas: linear habitats, green corridors
- Invasive vs. native species in plantation programmes
- NBHM: apiculture as part of agricultural diversification
- Connection to Zero Budget Natural Farming (ZBNF): bees essential for natural farming ecosystems

GS3 — Infrastructure:

- NHAI's expanding mandate: not just road construction but ecological stewardship
- Green Highways Policy 2015: mandates 1% of project cost for plantation along highways

Key Distinctions:

- Bee corridor ≠ wildlife corridor: bee corridors are linear plantation zones; wildlife corridors connect fragmented forest patches

- NHAI bee corridors: urban/semi-urban linear habitat; different from Elephant Reserve or Tiger Corridor

FACTS CORNER

- NHAI bee corridors: 4 million trees by 2026-27; 60% of all NHAI plantations
- Species: Neem, Karanj, Mahua, Palash, Bottle Brush, Jamun, Siris (all native)
- Global: 75% of food crops need pollinators; bees contribute \$577B/year in services
- NBHM: ₹500 crore; 20 lakh colonies; target 1.25 lakh MT honey/year
- India: 8th largest honey producer globally
- National highway network: 1,46,204 km (March 2025)
- Green Highways Policy 2015: 1% project cost for roadside plantation



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