SOCIETAL BENEFITS · CSR CASE STUDY

Why Miyawaki forests matter for your region.

Miyawaki afforestation is a proven, science-backed method for rapidly establishing dense, biodiverse native forests. These forests grow **10x faster** and achieve **30x higher density** than conventional plantations, delivering measurable ecosystem services within 2-3 years.

This brief compiles peer-reviewed evidence and case study data from our flagship **SPEC India Makarba plantation** in Ahmedabad — a 5.1-acre Miyawaki forest with 90%+ survival rate, 200+ species, and 200,000+ cumulative plants across all projects.

KEY IMPACT METRICS

Quantified outcomes from peer-reviewed research.

5-10	**~15%**	**2-4°C**	**6-52x**	**+287%**
TCO2/HA/YEAR	PM2.5 REDUCTION	AIR COOLING	SOIL PERMEABILITY	MICROBIAL ACTIVITY
Carbon sequestration (2-4x conventional)	Local particulate matter capture	Local temperature reduction	Stormwater absorption improvement	Soil metabolic rate within 3 years
90%+	**150+**	**5-10**	**3-20%**	**10x**
SURVIVAL RATE	NATIVE SPECIES	DB(A) NOISE	PROPERTY VALUE	GROWTH SPEED
At 24 months, across 200+ species	Per site (Makarba: 200+)	Attenuation by green spaces	Increase near quality green spaces	Faster than conventional plantations

Sources: Roy et al. (2025), Trees, Forests and People; Ospina Parra et al. (2025), Land; Chen et al. (2022), PMC; Akram et al. (2025), CABI Reviews; Bockarjova et al. (2019), Science of the Total Environment; Longman et al. (2025).

TANGIBLE BENEFITS

What the forest delivers — measured.

Each benefit below is backed by peer-reviewed research, with quantified data from Miyawaki sites in India and globally. These are the numbers CSR teams can report.

Benefit	Quantified Impact	BRSR	SDG
Carbon sequestration	5-10 tCO2/ha/year (2-4x conventional plantation)	P6	13
Air quality (PM2.5)	~15% reduction in local particulate matter	P6	3, 11
Temperature reduction	2-4°C ambient cooling; up to 6.4°C ground temp reduction	P6	11, 13
Stormwater management	Soil permeability improvement 6x-52x vs. control	P6	11, 15
Soil microbial activity	+287.5% metabolic rate increase within 3 years	P6	15
Biodiversity restoration	150+ native species per site; rapid pollinator & bird return	P6	15
Noise reduction	5-10 dB(A) attenuation by green spaces	P6	11
Property value enhancement	3-20% increase near quality green spaces	P8	11

CARBON SEQUESTRATION DETAIL

A 5-acre Miyawaki forest sequesters 10-20 tCO2/year in early years, scaling to 40-60+ tCO2/year as it matures.

South Indian Miyawaki forests show sequestration rates of 5.3 Mg C/ha/yr at 2 years, 20 Mg C/ha/yr at 4 years, and 33 Mg C/ha/yr at 5 years (Roy et al., 2025). Conventional plantations sequester 2-4 tCO2/ha/year. This is directly reportable under BRSR Principle 6 as a GHG emissions offset.

AHMEDABAD AIR QUALITY CONTEXT

Ahmedabad's PM2.5 annual average is 44 µg/m³ — exceeding the national standard of 40 µg/m³. PM10 in industrial corridors reaches 136.66 µg/m³. Dust fails to settle for 7+ months during the dry season (October-May). Miyawaki forests directly address this: dense, multi-layered canopies capture particulate matter year-round, with evergreen species maintaining filtration during the dry season when PM10 peaks.

URBAN HEAT ISLAND MITIGATION

Ahmedabad's land surface temperature rose from 38.97°C (2000) to 45.19°C (2023). UHI intensity reaches +1.8°C in summer nights and +3.2°C in winter nights. Miyawaki forests deliver 2-4°C ambient cooling through evapotranspiration and shading. The 30x density of Miyawaki means significantly more leaf area per unit area than conventional plantations, amplifying the cooling effect.

INTANGIBLE BENEFITS

What the forest delivers — felt.

Beyond measurable environmental outcomes, Miyawaki forests create lasting human and social value. These benefits map to BRSR Principles 3 (employee wellbeing) and 8 (inclusive growth).

Mental health & wellbeing

Natural environments restore directed attention and reduce physiological stress markers (cortisol, blood pressure). Dense, biodiverse green spaces provide richer sensory stimulation than manicured parks. BRSR P3: access to mental health.

Employee productivity & workplace wellness

Forest breaks improve mood, immune function biomarkers, and work attitudes (Longman et al., 2025). Outdoor work in natural settings reduces stress, particularly in high-stress groups. A Miyawaki forest on or near corporate premises is a living wellness asset.

Community engagement & social cohesion

Shared green spaces create common ground for diverse community members. Participation in planting fosters deep emotional connection and long-term stewardship. In Japan, children who plant Miyawaki forests return as adults with their own children.

Educational value & citizen science

Miyawaki forests serve as living laboratories. UNESCO-recognized programs engage schoolchildren as citizen scientists measuring plant growth, temperature, and biodiversity. SUGi's 62-school program in India reached 6,000+ students across 50 rural schools.

Aesthetics & brand reputation

Miyawaki forests transform barren land into lush, multi-layered green spaces within 2-3 years. The rapid visual transformation is photogenic, tangible CSR impact stakeholders can see and visit. Creates a living legacy that grows alongside the company's brand.

CASE STUDY: SPEC INDIA MAKARBA

5.1 acres. 200+ species. 90%+ survival.

Location	Makarba, Ahmedabad, Gujarat
Area	5.1 acres (direct implementation)
Cumulative plants	200,000+ across all projects
Species	200+ species, 360+ varieties/cultivars
Survival rate	90%+ at 24 months
Phase 1	July 2023 – July 2025 (complete)
Phase 2	Completing 2026
Maintenance	Concluded at 24 months; plots now self-sustaining
Client	SPEC India (39+ years, IT services)

The SPEC India Makarba project is Gardenia's flagship proof point. It demonstrates that Miyawaki plantations can be deployed at meaningful corporate scale in semi-arid Gujarat, with documented survival rates and species diversity. The site is visitable — we invite prospective clients to see the forest for themselves.

COMPLIANCE ALIGNMENT

BRSR & UN SDG mapping.

Miyawaki afforestation projects align directly with multiple BRSR principles and UN SDGs. This mapping helps CSR teams report outcomes in their annual BRSR filings and SDG disclosures.

BRSR PRINCIPLE ALIGNMENT

Principle	Miyawaki Alignment	Reportable KPIs
P3: Employee Wellbeing	Green space access improves mental health; forest breaks boost immune function and work attitudes	Wellness expenditure; employee access to green spaces; mental health programs
P6: Environment	Carbon sequestration, air quality, stormwater, soil health, biodiversity restoration	GHG offsets; species count & survival; area restored; water infiltration
P8: Inclusive Growth	Community green spaces, local employment, property value enhancement, noise reduction	CSR initiatives; jobs created; MSME procurement; community impact

UN SDG ALIGNMENT

SDG	Target	Miyawaki Contribution
SDG 3: Good Health	3.4	Air quality improvement reduces respiratory disease; green space access improves mental health
SDG 11: Sustainable Cities	11.6, 11.7	Improves urban air quality; creates accessible green public spaces; reduces UHI
SDG 13: Climate Action	13.1	Carbon sequestration 5-10 tCO2/ha/yr; climate adaptation through cooling and stormwater absorption
SDG 15: Life on Land	15.3, 15.5	Native species restoration; soil restoration; biodiversity habitat creation; degraded land recovery

BRSR CORE ASSURANCE TIMELINE

BRSR Core assurance is expanding: top 150 entities (FY 2023-24) → top 250 (FY 2024-25) → top 500 (FY 2025-26) → **top 1,000 (FY 2026-27)**. As assurance expands, demand for verifiable, quantifiable environmental CSR projects will increase. Gardenia Eco Forestry is positioned to serve this growing market with audit-ready data.

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Request a site visit to our 5.1-acre flagship Miyawaki project in Makarba, Gujarat. See the forest for yourself — 200+ species, 90%+ survival rate, self-sustaining at 24 months.