Kawasaki

Let the Good Times Roll

Corporate Social Responsibility Report

Shrub Plantation Initiative

2025 -2026



CSR PROJECT PARTNERS







India Kawasaki Motors Pvt. Ltd. is a leading automobile manufacturer committed to sustainable and responsible business practices.

Kawasaki
Let the Good Times Roll

As the CSR partner, the company provided financial support and strategic direction for the project, ensuring alignment with Schedule VII of the Companies Act, 2013. This initiative reflects its commitment to environmental sustainability and enhancing urban green cover.

Sustainability Initiatives is an organization focused on environmental sustainability and community development through practical, on-ground solutions.

As the implementation partner, SI led the planning and execution of the plantation activities, including site coordination, species selection, and supervision of on-site work. The organization also ensures structured monitoring, maintenance, and reporting to support long-term plant survival and project effectiveness.

sustainability initiatives ™

ACKNOWLEDGEMENT

Sustainability Initiatives extends its sincere gratitude to **India Kawasaki Motors Pvt. Ltd.** for their valuable support and commitment towards this CSR initiative focused on enhancing urban green cover along the Bhakti Shakti Chowk to Mukai Chowk stretch in Pune.

The collaboration and continued support have enabled the successful execution of the plantation activity, contributing to improved environmental conditions and promoting sustainable urban development. We also extend our appreciation to all stakeholders, field teams, and community members involved for their cooperation and support throughout the project.

We acknowledge the dedicated efforts of the teams from **Sustainability Initiatives** and **India Kawasaki Motors,** whose collective contributions ensured effective implementation, monitoring, and overall success of this initiative.

India Kawasaki Motors Team

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TABLE OF CONTENT

S.No	Section Title	Page No
1	Background	1
2	Project Objectives	3
3	Stakeholders Involved	4
4	Project Location	6
5	Scope of Work	7
6	Methodology	9
7	Overview of Plantation	11
8	Environmental Impact	15
9	Social Impact	20
10	Post- Plantation Irrigation Plan	22
11	Alignment with SDGs	24
12	Challenges	25
13	Way Forward	26
14	Conclusion	27

BACKGROUND

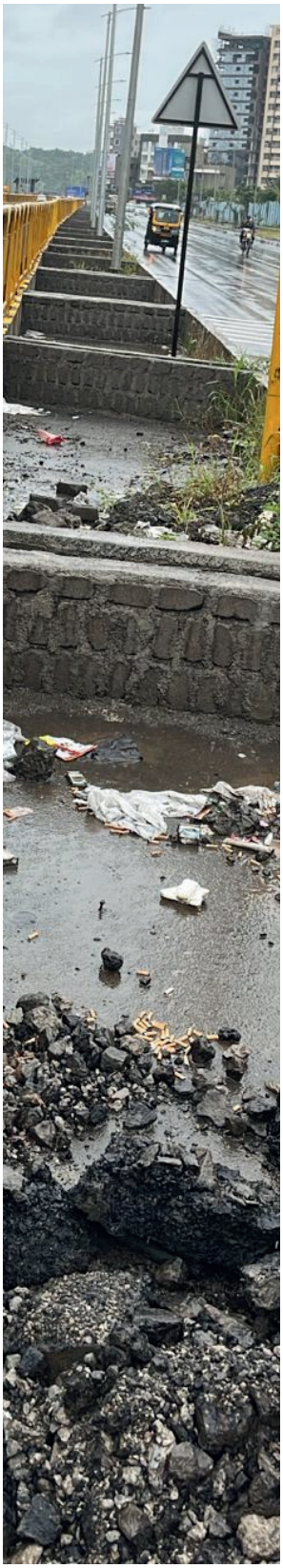
1

India is increasingly facing environmental challenges due to rapid urbanization, industrial growth, and population expansion. These factors have contributed to rising temperatures, declining green cover, increasing air pollution, and biodiversity loss **(IPCC, 2021; MoES, 2020)**

According to the **Intergovernmental Panel on Climate Change (IPCC, 2021),** global temperature rise and greenhouse gas emissions are major drivers of climate-related risks such as droughts, floods, and extreme weather events. In India, the average temperature has increased by approximately **0.7°C between 1901 and 2018,** highlighting the growing impact of climate change on ecosystems and livelihoods **(Government of India, Ministry of Earth Sciences, 2020).** Recognizing these concerns, the Government of India has introduced initiatives such as the **National Action Plan on Climate Change (NAPCC)** and the **National Mission for Green India**, which focus on enhancing green cover, conserving biodiversity, and strengthening ecosystem resilience **(Government of India, 2014).**

Vegetation plays a crucial role in promoting environmental sustainability and climate change mitigation. Plants and shrubs contribute to improving environmental quality by absorbing carbon dioxide from the atmosphere, trapping airborne pollutants, and enhancing urban ecological balance. ‘

According to the **Food and Agriculture Organization (FAO, Global Forest Resources Assessment, 2020)**, vegetation systems worldwide absorb approximately **2.6 billion tonnes of carbon dioxide annually**, highlighting the important role of plant cover in regulating the global carbon cycle. **In addition to carbon absorption, urban vegetation helps improve air quality** by filtering pollutants such as particulate matter, nitrogen oxides, and sulfur dioxide while also reducing dust pollution along transportation corridors.



Initial site condition with minimal vegetation and scope for greening

At the urban level, cities are experiencing increasing environmental pressure due to population growth and infrastructure development. Pune, one of the fastest-growing metropolitan regions in India, has witnessed rapid industrialization and urban expansion over the past few decades.

The **Pune Metropolitan Region has a population exceeding 7 million (Government of Maharashtra, 2023),** and the city continues to experience significant growth in vehicular traffic, built-up areas, and industrial activities. These developments have contributed to environmental challenges such as air pollution, reduction of green spaces, and the urban heat island effect. According to the **World Health Organization (WHO, 2022),** air pollution remains one of the major environmental health risks in urban areas worldwide. Increasing urban greenery through roadside plantations and landscaped vegetation corridors has therefore become an important strategy for improving air quality, managing urban temperatures, and enhancing urban environmental conditions.

In response to the need for strengthening urban greenery and promoting environmental sustainability, **India Kawasaki Motors Pvt. Ltd.** has undertaken a roadside shrub plantation initiative as part of its **Corporate Social Responsibility (CSR) program.** The project is implemented by **Sustainability Initiatives** in coordination with **Pimpri Chinchwad Municipal Corporation,** focusing on enhancing green cover along the road divider stretch between **Bhakti Shakti Chowk and Mukai Chowk in the Pimpri–Chinchwad** region of Pune. The initiative involves the plantation of **approximately 49,617 shrubs** along the divider corridor to improve roadside aesthetics, reduce dust pollution, and contribute to environmental enhancement within the urban landscape.



Pre-plantation divider with exposed soil

PROJECT OBJECTIVES

2

The plantation initiative was undertaken with the objective of strengthening urban green infrastructure and promoting environmental sustainability within the Pimpri–Chinchwad region. The project focuses on integrating vegetation into urban spaces through systematic shrub plantation along road dividers, thereby improving environmental quality and enhancing the visual character of urban infrastructure.

Through planned plantation and structured maintenance, the initiative aims to support sustainable urban landscaping, dust reduction, and environmental enhancement in a rapidly developing metropolitan area. Accordingly, the primary objectives of the project were:

A. Increase Urban Green Cover

- Enhance vegetation along urban road infrastructure through systematic shrub plantation along the divider stretch.
- Strengthen green cover within rapidly developing urban areas of Pimpri–Chinchwad.

B. Support Environmental Sustainability

- Improve environmental conditions by increasing vegetative cover within the urban landscape.
- Contribute to dust reduction and environmental improvement along busy road corridors.

C. Conservation of Urban Biodiversity

- Provide supportive habitats for insects, butterflies, and small urban fauna.
- Encourage ecological balance within the urban ecosystem through the introduction of flowering and ornamental shrubs.





Systematic plantation enhancing green cover

D. Improvement of Environmental Quality

- Help reduce roadside dust pollution generated by vehicular movement.
- Support soil stabilization along the road divider through dense shrub vegetation.

E. Enhancement of Urban Landscape

- Improve the visual appearance of the road corridor by developing a continuous landscaped green belt.
- Create cleaner, greener, and aesthetically appealing public spaces along urban transport routes.

F. Promotion of Sustainable Urban Development

- Demonstrate how structured roadside plantation initiatives can support urban environmental management.
- Highlight the role of corporate social responsibility (CSR) in strengthening ecological sustainability and urban green infrastructure.



Initial plantation along roadside stretch





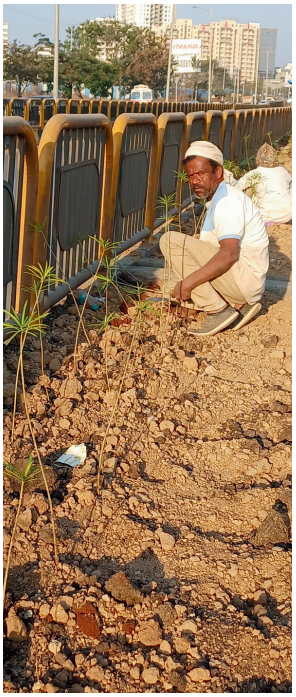
Developing continuous green corridor

STAKEHOLDERS INVOLVED

3

The successful implementation of the plantation initiative involved the collaboration of multiple stakeholders who contributed through financial support, project execution, administrative coordination, and operational assistance. The involvement of these stakeholders ensured effective planning, smooth implementation of the shrub plantation activities, and the long-term sustainability of the green corridor developed under the project.

The collaborative efforts of these stakeholders played a key role in ensuring the successful execution of the project and in strengthening the development of a sustainable urban green corridor in the Pimpri–Chinchwad region.



Plantation Execution

Stakeholder	Role
India Kawasaki Motors Pvt. Ltd. (CSR Sponsor)	Provided financial support for the implementation of the roadside shrub plantation initiative under its Corporate Social Responsibility (CSR) program, supporting efforts aimed at improving urban greenery and environmental sustainability.
Sustainability Initiatives (Implementing Partner)	Responsible for planning and executing the project, including site preparation, plantation activities, coordination with stakeholders, soil leveling and filling, and watering of the plantation for 1 year (December 2025 to December 2026).
Pimpri Chinchwad Municipal Corporation (Municipal Authority)	Facilitated site identification, provided necessary permissions, and supported coordination to ensure alignment with urban landscaping and environmental management plans. The Garden Department of PCMC also guided the selection of plant species suitable for roadside plantation and provided black cotton soil.
Local Community and Road Users	Beneficiaries of the improved environmental conditions and enhanced roadside greenery along the corridor, while also gaining greater awareness about the importance of urban green spaces and environmental conservation.

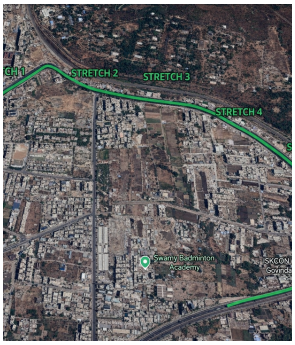
PROJECT LOCATION

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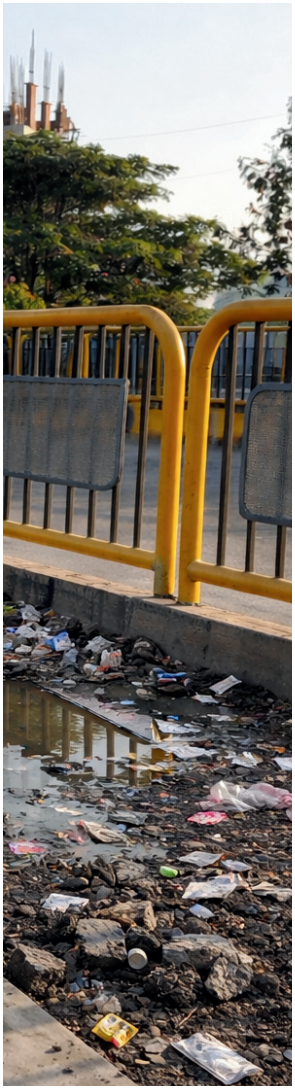
The plantation project has been implemented along the road divider stretch between **Bhakti Shakti Chowk and Mukai Chowk in the Pimpri–Chinchwad r**egion of the Pune Metropolitan Area, Maharashtra, India. This road corridor falls under the administrative jurisdiction of the **Pimpri Chinchwad Municipal Corporation (PCMC)** and serves as an important transportation route connecting several residential, commercial, and industrial areas within the region.

The plantation activity has been carried out along the **central road divider covering an approximate length of 2200 meters (2.2 km), with an average effective width of about 2 meters (both sides of the divider). The starting point of the plantation stretch is located near BRTS Bhakti Shakti Chowk (Approx. Latitude: 18.6736° N, Longitude: 73.7703° E), while the endpoint lies near Mukai Chowk (Approx. Latitude: 18.6536° N, Longitude: 73.7288° E).** This stretch forms part of a key urban mobility corridor used by daily commuters, public transport vehicles, and industrial traffic across the Pimpri–Chinchwad region.

Prior to the intervention, the **site was in a degraded and neglected condition, characterized by construction debris, plastic waste, water stagnation in patches, uneven soil, and absence of vegetation.** These conditions reduced the aesthetic appeal and ecological value of the corridor, highlighting the need for structured green intervention. The site was selected in consultation with municipal authorities based on its urban significance, environmental need, and availability of continuous divider space. The central divider offered an opportunity to establish a linear green corridor without affecting road infrastructure or visibility.



Plantation corridor segmented into five stretches



Project site along Bhakti Shakti–Mukai corridor

SCOPE OF WORK

5

The implementation of the plantation initiative involved a series of carefully planned and coordinated activities to ensure the successful establishment and long-term sustainability of the roadside vegetation. Each stage of the project from site preparation to monitoring was carried out systematically to support healthy shrub growth while enhancing the environmental and aesthetic value of the project corridor.

These activities were undertaken in coordination with relevant stakeholders to ensure proper planning, execution, and maintenance of the plantation. The major activities undertaken under the project include:

- **Site Preparation**

The identified road divider stretch was initially surveyed to assess site conditions and determine suitable planting locations. Clearing of debris, removal of unwanted vegetation, and marking of designated plantation areas were carried out to prepare the site for plantation activities. This process ensured that sufficient space was available for planting without affecting road infrastructure or traffic visibility.

- **Soil Preparation**

Soil preparation was carried out along the divider stretch to facilitate proper root development and plant establishment. Soil quality was improved through soil leveling and filling where required, ensuring suitable conditions for shrub plantation. These preparatory activities helped improve soil stability and supported healthy plant growth. Soil for plantation was provided by the Garden Department of PCMC, while soil leveling and filling activities were carried out by **Sustainability Initiatives.**



Site preparation and ground leveling

- **Shrub Plantation**

Plantation activities were carried out systematically along the road divider stretch. Approximately **49,617 shrubs** were planted in a planned layout to create dense and continuous vegetation coverage. The plantation design followed a structured linear arrangement suitable for narrow divider spaces, helping improve roadside aesthetics while contributing to dust reduction and environmental enhancement.

- **Installation of Branding Boards**

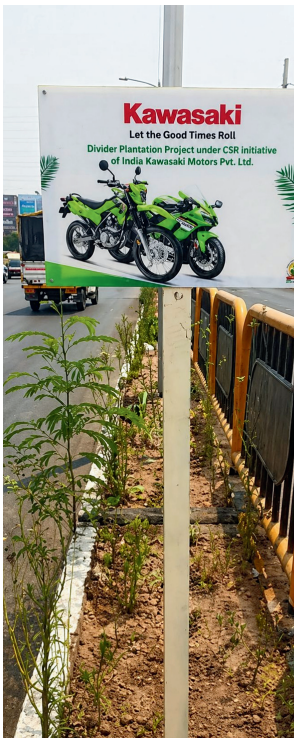
A total 32 branding boards of size 12 X 18 inch with a acrylic branding of 4' height and powder coating with concrete at the base were installed at selected locations along the corridor to acknowledge the support of the CSR sponsor and the implementing partner. These boards also serve to raise awareness among road users about environmental conservation and the importance of urban greening initiatives.

- **Watering and Maintenance**

As per the project scope, Sustainability Initiatives (SI) is responsible for regular watering of the plantation for one year, from December 2025 to December 2026, ensuring proper plant establishment during the early growth phase.

- **Reporting**

Sustainability Initiatives (SI) is responsible for preparing and submitting final project reports to the CSR funder, ensuring transparency, accountability, and systematic documentation of project outcomes, environmental impact, and key learnings for informed decision-making and future initiatives.



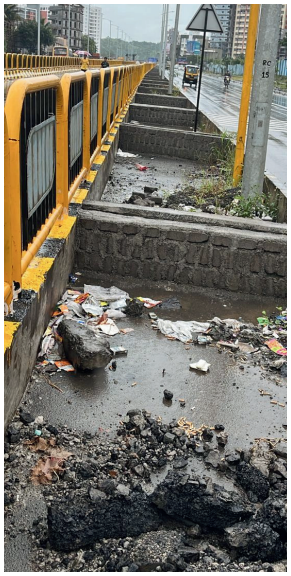
Installation of Branding Boards



Shrub plantation in progress

METHODOLOGY 6

The plantation initiative was implemented through a structured and phased approach to ensure effective planning, systematic execution, and long-term sustainability of the roadside vegetation. The methodology adopted for the project focused on careful site assessment, appropriate shrub species selection, proper soil preparation, and continuous monitoring to ensure healthy plant establishment. The implementation process involved close coordination among the project stakeholders to ensure that the plantation activities were aligned with urban infrastructure requirements and environmental objectives.



Initial site condition

Phase 1 – Planning	
The first phase focused on planning and preparatory activities required for the successful execution of the project. This stage involved assessing site conditions, identifying suitable plantation areas, and selecting shrub species that could thrive in urban roadside environments.	
Activities	**Description**
Site Identification	The road divider stretch between Bhakti Shakti Chowk and Mukai Chowk was identified as a suitable site for plantation based on factors such as availability of divider space, adequate sunlight exposure, and the need to enhance green cover along the corridor. The site selection was carried out in consultation with municipal authorities to ensure that the plantation activities were compatible with existing road infrastructure and urban landscaping plans.
Species Selection	Shrub species were selected based on their adaptability to the local climatic conditions of Pune, tolerance to roadside environmental stress such as dust and vehicular emissions, and their ability to grow well in limited soil spaces typically found in road dividers. Preference was given to hardy and climate-resilient species suitable for urban landscaping. All plant species were selected in consultation with the Garden Department of PCMC, ensuring suitability to local conditions and preference for the suitable species.
Coordination with Stakeholders	During this phase, coordination was undertaken with key stakeholders including the CSR funder, the implementing partner, and municipal authorities. Necessary approvals were obtained and plantation plans were finalized to ensure smooth implementation of the project.

Phase 2 – Implementation

The second phase involved the execution of plantation activities at the project site. This stage included soil preparation, shrub plantation along the divider, and installation of project branding boards.

Activities	Description
Soil Preparation	Soil preparation activities were carried out along the divider stretch to support proper root development and plant establishment. Soil provided by the Garden Department of PCMC, was used for plantation. Soil leveling and filling were executed by Sustainability Initiatives (SI) to ensure suitable planting conditions for shrubs.
Shrub Plantation	Approximately 49,617 shrubs were planted systematically along the road divider following a structured plantation layout. The shrubs were planted in rows with appropriate spacing to create dense vegetation coverage along the corridor. This plantation pattern helps enhance roadside aesthetics while contributing to dust reduction and environmental improvement.





On-site manual plantation with regular watering during the establishment phase

Phase 3 – Maintenance

The final phase focuses on maintaining the plantation through regular watering to ensure healthy growth and long-term sustainability.

Activities	Description
Maintenance via Watering	Regular watering is carried out to support shrub establishment, particularly during the early growth phase. As per the project scope, Sustainability Initiatives (SI) isin charge of for watering the plantation for a period of one year, from December 2025 to December 2026, to ensure proper plant establishment. This support helps improve survival rates and enables the shrubs to adapt effectively to roadside conditions.
Reporting	Final project reporting is carried out to document plantation outcomes, implementation details, and overall performance. Sustainability Initiatives (SI) is responsible for preparing and submitting final project reports to the CSR funder, ensuring transparency, accountability, and comprehensive documentation of project outcomes and impact.

OVERVIEW OF PLANTATION 7

The roadside plantation initiative involved the systematic planting of shrubs along the road divider stretch **between Bhakti Shakti Chowk and Mukai Chowk in the Pimpri–Chinchwad region.** The plantation was designed to create a continuous green corridor that enhances the ecological value and visual character of the urban landscape while supporting environmental sustainability.

Under this project, a total of approximately **49,617 shrubs** were planted along the identified road corridor. The shrubs were planted in a planned layout along the road divider to create dense and continuous vegetation coverage suitable for narrow divider spaces. This plantation design ensures that greenery is enhanced without obstructing road visibility or affecting traffic movement.

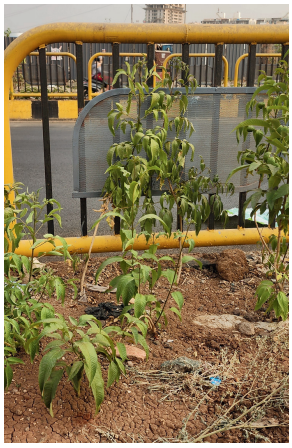
Dense shrub plantation plays an important role in **reducing dust pollution, stabilizing soil, preventing erosion, and improving the visual continuity of the roadside landscape.** In addition, flowering and ornamental shrubs help support small urban fauna such as **butterflies, pollinators, and beneficial insects,** thereby contributing to urban biodiversity.

The plantation was carried out along an approximate stretch of **2200 meters,** with the divider having an average effective width of about **2 meters (both sides of the divider),** resulting in a total plantation coverage of approximately **4,400 square meters.** This structured plantation approach helps create a **continuous landscaped vegetation corridor,** improving both environmental quality and roadside aesthetics. The Garden Department of PCMC also provided guidance on the selection of plant species suitable for roadside plantation.



Shrub plantation preparation and execution along the divider stretch

The plantation layout was **further organized into five stretches along the 2200 m road divider on both sides,** each with specific plant species and spacing arrangements. Shrub species such as **Hamelia patens, Thevetia peruviana, and Tecoma stans / Eranthemum red** were planted with a **spacing of 0.6 m center-to-center in two rows,** while ground cover species such as Tradescantia pallida, **Tradescantia zebrina, and Tradescantia spathecia** were planted **with 0.4 m spacing in three rows** to create dense vegetation coverage.



Shrub planation along divider

Note: Planting spacing was implemented as per design guidelines, with minor deviations accommodated to address site-specific conditions and operational constraints.

The key plantation statistics are summarized below:

Category	Quantity
Shrubs Planted	49,617
Total Plantation Area Covered	Approx. 4,400 sq. m sq. m
Length of Plantation Stretch	Approx. 2.2 km

Shrub Species Used in the Project

1. Thevetia peruviana



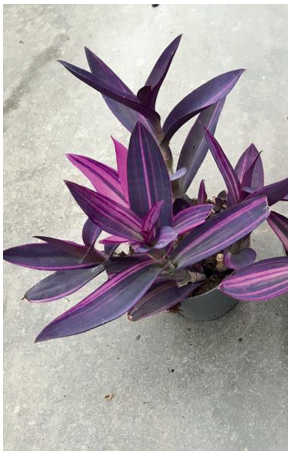
- **Common Name:** Yellow Oleander
- **Ideal Height:** 2–4 m at maturity
- Evergreen shrub with bright yellow flowers providing year-round greenery
- Highly drought-resistant; suitable for low-water urban landscapes
- Performs well in poor soils and high-temperature roadside conditions
- Effective for median stabilization & visual screening
- Requires minimal maintenance once established

2. Tecoma stans



- **Common Name:** Yellow Bells
- **Ideal Height:** 3–4 m at maturity
- Fast-growing ornamental shrub with abundant seasonal flowering
- Air pollution-tolerant and supports urban biodiversity by attracting pollinators.
- Suitable for avenue plantations, medians, and open landscapes; thrives in full sun, adapts to varied soils, and requires minimal water once established.

3. Tradescantia pallida



- **Common Name:** Purple Heart
- **Ideal Height:** 0.2–0.3 m
- Spreading ground cover with striking purple foliage
- Known for phytoremediation absorbs pollutants & improves air quality
- Thrives in poor soils, withstands extreme conditions, and helps stabilize slopes to prevent erosion.
- Fast-growing, low-maintenance ground cover ideal for borders, dividers, and urban green belts.

4. Hamelia patens



- **Common Name:** Firebush
- **Ideal Height:** 1–3 m at maturity
- Evergreen shrub with bright orange-red tubular flowers
- Strong pollinator attractor (butterflies, bees, hummingbirds)
- Thrives in full sun, tolerates heat and moderate drought, and is ideal for hedges, medians, and ornamental landscaping.
- Supports urban biodiversity, adapts well to urban conditions, and offers medicinal benefits (anti-inflammatory & antimicrobial).

5. Tradescantia spathecia



- **Common Name:** Rhoeo / Oyster Plant
- **Ideal Height:** 0.2–0.3 m
- Dense, upright ground cover with green upper and purple underside leaves
- Thrives in shaded to semi-shaded conditions
- Effective in weed suppression and soil stabilization
- Enhances visual appeal with contrasting foliage
- Tolerant to urban stress and low maintenance
- Suitable for borders, medians & landscaped corridors

Plantation Details of Shrubs/Ground Covers

Category	Particulars	Plant Type	Quantity (Nos)
A	**Total No. of Plants (as per Agreement)**		49,070
B	**Total No. of Plants Planted at Site**		49,617
C	**Large Shrubs**	Hamelia patens	6,786
		Thevetia peruviana	8,786
		Tecoma stans	3,156
D	**Ground Covers**	Tradescantia spathacea	22,264
		Tradescantia pallida	8,625

ENVIRONMENTAL IMPACT 8

A. Carbon Sequestration

Vegetation plays an important role in mitigating climate change by absorbing carbon dioxide (CO_2) from the atmosphere through the process of **carbon sequestration.** Plants store carbon in their biomass such as stems, leaves, and roots while also improving soil organic carbon over time.

Although shrubs typically store less carbon than large trees due to their smaller biomass, large-scale shrub plantations can still contribute meaningfully to carbon absorption. According to the **Food and Agriculture Organization (FAO, 2020)** and urban vegetation studies, shrubs can absorb approximately **1–3 kg of CO_2 per plant per year,** depending on species, environmental conditions, and maturity.

Under this project, **49,617 shrubs** were planted along the road divider stretch. Based on an average sequestration rate of **2 kg CO_2 per shrub per year,** the estimated annual carbon sequestration potential of the plantation can be approximated as:

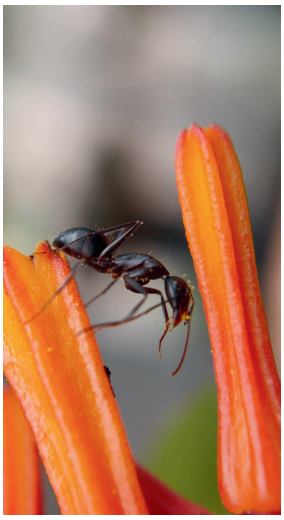
Estimated Annual Carbon Sequestration

- Number of shrubs planted = **49,617 shrubs**
- Average CO_2 absorption per shrub = **2 kg CO_2 per year**
- Estimated annual carbon sequestration:

49,617 × 2 = 99,234 kg CO_2 per year

This equals approximately **99 tonnes of CO_2 per year** under normal growth conditions. As the shrubs mature and biomass increases, their carbon storage capacity is expected to increase gradually. Over time, the plantation contributes to improving urban carbon balance and supporting climate mitigation efforts.

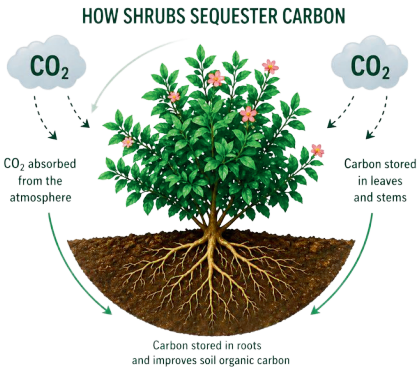
Note:
Actual carbon sequestration may vary depending on species growth, survival rate, and site conditions.



Hamelia patens supporting microfauna activity



Thevetia peruviana supporting urban micro-biodiversity



B. Improved Biodiversity

The shrub plantation initiative contributes to strengthening **urban biodiversity** by creating habitats and ecological niches within the roadside landscape. The introduction of diverse shrub species along the corridor supports a range of insects, pollinators, and small urban fauna that can thrive in city environments.

Flowering shrub species such as **Hamelia patens, Tecoma stans, and Thevetia peruviana** produce nectar-rich flowers that attract pollinators including bees, butterflies, and other beneficial insects. These plants help support butterfly species commonly found in urban landscapes such as **Plain Tiger (Danaus chrysippus), Common Mormon (Papilio polytes), and Lime Butterfly (Papilio demoleus).**

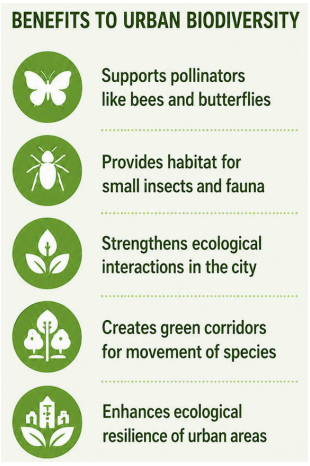
Ground cover species such as Tradescantia pallida, Tradescantia zebrina, and Tradescantia spathecia provide dense vegetation coverage that helps support small insects and soil organisms. Such vegetation contributes to strengthening ecological interactions and improving biodiversity in urban roadside environments.

Research indicates that **urban green spaces can support up to 20–30% of biodiversity within cities (UNEP, 2020).** Roadside vegetation corridors also function as **micro-ecological networks,** enabling pollinators and insects to move between fragmented green spaces.

By increasing plant diversity and creating continuous vegetation cover, the project helps enhance biodiversity and ecological resilience within the Pimpri–Chinchwad urban landscape.



Plain Tiger (Danaus chrysippus) on Tecoma stans] - Supporting pollinator-driven biodiversity



C. Soil Conservation

Vegetation plays a significant role in preventing soil erosion and improving soil stability, particularly in roadside environments where soil is often exposed to wind, rainfall, and vehicular disturbances.

Dense shrub vegetation helps **bind soil particles through root systems,** reducing soil erosion caused by surface runoff and wind. Ground-cover species planted along the divider provide protective vegetation cover that reduces direct exposure of soil to rainfall and improves moisture retention.

Studies indicate that vegetative cover can reduce soil erosion by approximately **70–90% compared to bare soil conditions (FAO, 2019).** The dense root systems of shrubs help stabilize soil and reduce roadside dust generation, thereby improving soil health and supporting long-term environmental sustainability.

Based on the plantation area of approximately **4400 m² (0.44 hectares) considering plantation on both sides of the divider,** the potential soil conservation impact can be estimated as follows:

CALCULATIONS

- Length = 2.2 km (2200 m)
- Divider width = 2 m (both sides)

Area = 2200 m × 2 m = 4400 sq. m

Convert to Hectares

4400 sq.m = 0.44 ha

Assuming Erosion Reduction:

- Bare soil erosion = 12 tons/ha/year
- Vegetated soil erosion = 3 tons/ha/year

So Soil Saved:

(12 – 3)× 0.44 = 3.96 tons/ha/yr

3.96 tons soil conserved per year

Final Estimate

4 tons of soil conserved per year



Parameter	Value
Length of Plantation	2.2 km
Average Divider Width	2 m
Total Plantation Area	4400 m² (0.44 ha)
Estimated Soil Erosion (Bare Soil)	12 tons/ha/year
Estimated Soil Erosion (Vegetated Area)	3 tons/ha/year
Estimated Soil Conserved (Approx)	4 tons per year

D. Air Quality Improvement

The project site lies along the road corridor in the Pimpri–Chinchwad region, an area characterized by high vehicular movement and urban activity.

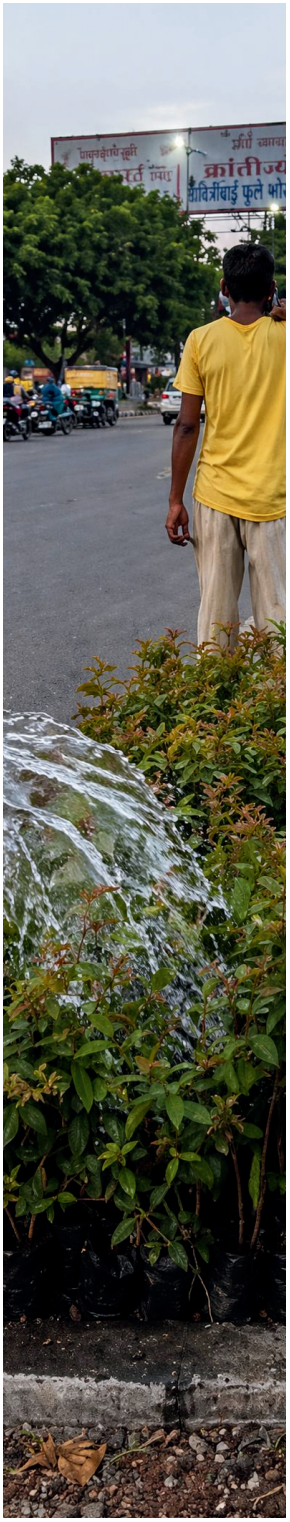
According to monitoring data from the **Central Pollution Control Board (CPCB, 2023)** and the **Maharashtra Pollution Control Board (MPCB, 2022),** air quality levels in Pimpri–Chinchwad frequently fall within the **"Moderate" to "Poor" Air Quality Index (AQI) category,** typically ranging between **100 and 160** depending on seasonal conditions and traffic intensity.

The plantation of **49,617 shrubs** along the road divider helps create a **vegetative buffer** that contributes to improving localized air quality. Vegetation helps mitigate air pollution through several mechanisms:

- **Particulate matter filtration:** Leaves trap airborne dust particles such as $PM_{2.5}$ and PM_{10}.
- **Dust suppression:** Dense shrub coverage helps reduce dust resuspension caused by vehicular movement.
- **Pollutant absorption:** Vegetation absorbs gaseous pollutants such as nitrogen oxides (NOx) and sulfur dioxide (SO_2).

Studies on urban green infrastructure suggest that roadside vegetation belts can **reduce particulate matter concentrations by approximately 10–25% in localized areas (World Bank, 2021).**

By establishing dense vegetation along the corridor, the project contributes to improving air quality and creating a healthier urban environment.



Green buffer reducing roadside pollution

E. Urban Heat Reduction

Urban areas often experience the Urban Heat Island (UHI) effect, where built surfaces such as asphalt roads and concrete structures absorb and retain heat, leading to higher temperatures compared to surrounding vegetated areas. These materials store heat during the day and release it slowly at night, resulting in elevated ambient temperatures and reduced thermal comfort.

The project corridor experiences significant vehicular movement and prolonged exposure to direct sunlight, contributing to localized heat buildup along the road divider and adjacent surfaces. Continuous traffic, paved infrastructure, and limited vegetation further intensify heat accumulation in such urban environments.

Vegetation plays an important role in mitigating the urban heat island effect through several natural mechanisms:

- **Shading of soil :** Vegetation reduces direct solar radiation reaching the ground and thereby lowering surface temperatures.
- **Evapotranspiration:** Plants release water vapor into the atmosphere during transpiration, which helps cool the surrounding air and improves local microclimatic conditions.
- **Reduction of heat absorption:** Dense vegetation helps limit the amount of heat absorbed by exposed soil and paved surfaces.

According to the **Intergovernmental Panel on Climate Change (IPCC, 2022) and UN-Habitat Urban Climate Report (2021),** increasing vegetation in urban environments can reduce local ambient temperatures by approximately 2–4°C in densely built areas.



Plantation reducing surface heat impact

SOCIAL IMPACT

9

The roadside plantation initiative has generated several direct and observable social benefits for people using the road corridor between Bhakti Shakti Chowk and Mukai Chowk in the Pune metropolitan region. This stretch is frequently used by commuters traveling between residential areas, industrial zones, and surrounding suburbs. The introduction of dense vegetation along the road divider has helped improve the environmental quality and visual appeal of this public space.

The key social impacts of the project include:

A. Improved Roadside Aesthetics:

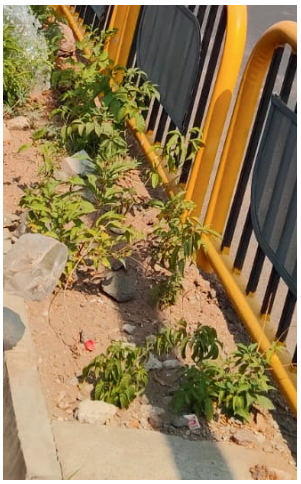
The plantation of shrubs has transformed the road divider into a continuous green corridor, significantly improving the visual landscape of the area. Urban landscape studies suggest that well-maintained roadside vegetation can enhance public perception of urban spaces and contribute to improved city livability (UN-Habitat, 2022).

B. Reduced Dust Exposure for Road Users:

Dense shrub vegetation along the divider helps reduce dust dispersion caused by vehicular movement. According to the Central Pollution Control Board (CPCB, 2021), roadside vegetation can reduce dust resuspension by 10–20%, improving the roadside environment for commuters, pedestrians, and nearby residents.

C. Improved Commuter Experience:

The presence of greenery along frequently used road corridors creates a more pleasant and comfortable travel environment for daily commuters. Research on urban green infrastructure indicates that vegetated corridors can positively influence mental well-being and reduce stress levels among urban populations (World Health Organization, 2021).



Improved roadside aesthetics for commuters



Enhanced greenery improving urban environment

D. Better Thermal Comfort for Road Users:

Dense vegetation helps reduce heat accumulation along exposed road surfaces and improves the surrounding microclimate. Studies indicate that increasing urban vegetation can reduce perceived temperatures by 2–4°C in built-up environments **(IPCC, 2022; UN-Habitat, 2021),** thereby enhancing thermal comfort for commuters and pedestrians.





E. Promotion of Environmental Awareness:

Visible plantation along a public road corridor demonstrates the role of green infrastructure in improving urban environments. Such initiatives help raise awareness among citizens about the importance of environmental conservation and urban greening.



F. Contribution to Cleaner and Healthier Public Spaces:

The establishment of dense shrub vegetation along the divider contributes to maintaining cleaner surroundings, improving environmental conditions, and strengthening the integration of green spaces within urban infrastructure.

POST-PLANTATION IRRIGATION PLAN

10

The long-term sustainability of the plantation depends on regular watering of the planted shrubs. A structured watering plan has been implemented to support healthy plant growth, improve survival rates, and maintain the overall quality of the roadside green corridor. The focus is on consistent irrigation, particularly during the initial growth phase, to ensure proper plant establishment.

- **Watering Plan**

During the initial establishment phase, newly planted shrubs require regular watering to support root development and healthy growth. Water requirements vary depending on plant species, climatic conditions, and soil moisture levels. Based on standard urban landscaping practices, shrubs typically require **1–2 liters of water per plant per day during the early growth stage.**

Under this project, approximately **49,617** shrubs were planted along the divider stretch. During the initial plantation phase, water was supplied using tankers of approximately **4,000-liter capacity,** with around **five tankers deployed over a two-day period** to support plant establishment.



Watering carried out to ensure proper plant establishment

Plantation Component	Quantity	Water Requirement per Plant	Estimated Daily Water Requirement
Shrubs	49,617	1–2 liters per shrub/day	49,000–98,000 liters/day

This level of watering is primarily required during the **initial establishment period (first 3–6 months)**. As the shrubs establish their root systems, the watering frequency is gradually reduced and plants become more dependent on natural rainfall.

- **Periodic Site Inspections**

Periodic site inspections were conducted throughout the implementation phase to monitor the progress and quality of plantation activities along the road corridor between **Bhakti Shakti Chowk and Mukai Chowk in Ravet.**

As per the implementation schedule, the plantation activities were completed within approximately **45 days,** beginning with soil leveling and site preparation, followed by phased plantation activities and installation of branding boards before final site cleaning and handover.

Regular inspections ensured that plantation work was carried out according to the planned layout and spacing across the divider stretches. These visits also helped identify operational challenges, coordinate field teams, and ensure timely completion of the project.



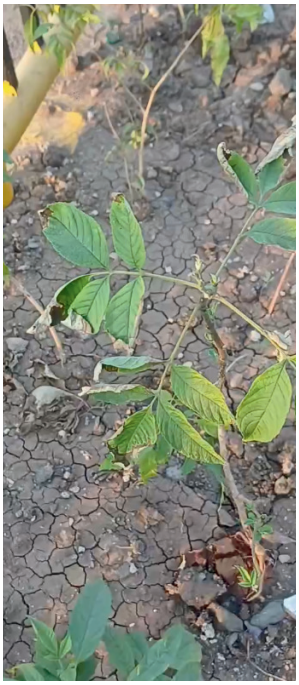
Field-level plantation work in progress

- **Watering Responsibility**

The plantation work was completed in December 2025, and the implementing partner, **Sustainability Initiatives,** is responsible for watering of the plantation until December 2026, which oversees the care and upkeep of the shrubs during the establishment period.

As per the project scope, the implementing partner is responsible for providing **watering for a period of one year after plantation.**

The project aims to ensure that the shrubs become well established and continue to contribute to **improved roadside aesthetics, dust reduction, and environmental enhancement a**long the project corridor.



Plant growth indicating survival

ALIGNMENT WITH SDG's 11

The plantation initiative contributes to several **United Nations Sustainable Development Goals (SDGs)** by supporting environmental sustainability, improving urban green infrastructure, and promoting climate resilience in the Pimpri–Chinchwad region. Through the establishment of dense roadside vegetation along the divider corridor, the project helps address environmental challenges associated with urbanization while enhancing the quality of urban public spaces.



- **SDG 11: Sustainable Cities and Communities**

The project contributes to creating greener and more sustainable urban environments by increasing vegetation along a major road corridor. The development of a continuous green belt improves urban aesthetics, enhances environmental quality, and supports the integration of green infrastructure within city landscapes.



- **SDG 13: Climate Action**

The plantation of approximately 49,070 shrubs contributes to climate change mitigation by supporting carbon sequestration and improving microclimatic conditions. Vegetation also helps reduce localized heat buildup and supports climate-resilient urban infrastructure.



- **SDG 15: Life on Land**

The introduction of diverse shrub species helps strengthen urban biodiversity by providing habitats and food sources for pollinators, insects, and small urban fauna. The project also contributes to soil stabilization and improved ecological balance within the urban environment.



- **SDG 3: Good Health and Well-being**

By improving air quality, reducing dust pollution, and creating greener surroundings along a frequently used road corridor, the project contributes to healthier urban environments for commuters and nearby residents.



CHALLENGES 12

The implementation of the plantation project provided valuable insights into the practical challenges associated with urban roadside plantation. Working along an active road corridor required careful coordination, timely execution, and continuous monitoring to ensure the successful establishment of shrubs. The experience gained during the project highlights several operational and environmental challenges, along with important lessons that can support the planning and implementation of similar urban greening initiatives in the future.

Key Challenges

- **Weather Conditions:**

Weather variability can significantly influence plantation activities. Heavy rainfall during the monsoon season may delay soil preparation and plantation work, while prolonged dry periods or high temperatures can affect plant establishment.

- **Soil Quality Constraints:**

The soil along the road divider contains a high proportion of rocky material with limited fertile topsoil, leading to poor nutrient availability and low water retention. These conditions hinder plant growth and require soil improvement for proper root development and shrub establishment. Additionally, water from the divider outlet does not percolate effectively, and due to open or missing divider blocks, some of it seeps out and flows onto the road.

- **Waste Accumulation:**

The plantation site was affected by the accumulation of waste materials such as plastic bags, wrappers, food waste, and glass bottles, primarily due to open dumping along the roadside. This not only affected the aesthetic condition of the site but also posed challenges to plant growth and maintenance activities.

- **Weed Growth and Plant Protection Measures:**

Rapid weed growth across the plantation area competes with shrubs for nutrients, water, and sunlight, affecting plant health. Periodic application of insecticides and weedicides is required to control pests and unwanted vegetation, ensuring healthy growth and overall plantation quality.





WAY FORWARD

13

The implementation of the plantation project has provided important insights that can help strengthen the planning and execution of future urban greening initiatives. Based on the experience gained during the project, several measures can be considered to further improve the effectiveness and sustainability of similar plantation programs.

- **Strengthening Monitoring and Maintenance Systems:**

Regular monitoring along with timely maintenance activities such as weed removal, soil care, application of fertilizers or insecticides where required, and proper site upkeep can help maintain plant health and ensure long-term sustainability of the plantation.

- **Better Planning of Plantation Layout:**

Dividing plantation areas into smaller stretches and implementing structured plantation layouts can help ensure uniform plant distribution and more effective supervision during implementation.

Overall, these measures can support the development of more resilient and sustainable urban plantation initiatives, contributing to stronger green infrastructure and improved environmental quality in rapidly growing urban regions.



Structured plantation layout for improved coverage

CONCLUSION

14

The plantation initiative along the road divider stretch between **Bhakti Shakti Chowk and Mukai Chowk r**epresents an important step toward strengthening urban greenery in the Pimpri–Chinchwad region. Through the systematic plantation of approximately **49,617 shrubs,** the project has helped transform the road corridor into a continuous green belt, improving the visual landscape and enhancing the environmental quality of the surrounding urban space. The **transformation from a degraded, debris-filled site into a structured green corridor** highlights the effectiveness of planned urban plantation interventions.

The project demonstrates how well-planned roadside plantation initiatives can generate multiple environmental benefits. Dense shrub vegetation contributes to **reducing roadside dust, improving local air quality, stabilizing soil along the divider, and supporting urban biodiversity,** including pollinators and beneficial insects. In addition, increased vegetation helps improve the **local microclimate by reducing surface heat and enhancing thermal comfort** for commuters and nearby residents.

The initiative also highlights the significant role of corporate participation in environmental sustainability through Corporate Social Responsibility (CSR). By supporting urban greening initiatives, corporate organizations can contribute meaningfully to addressing environmental challenges associated with rapid urbanization.



On-ground plantation strengthening urban greenery

The collaboration between the CSR sponsor, implementing partner, and local authorities enabled effective planning, execution, and maintenance of the plantation.

Furthermore, the project demonstrates how **strategically implemented urban landscaping interventions can contribute to broader sustainability goals,** including improved urban livability, strengthened green infrastructure, and increased environmental awareness.

Overall, the initiative serves as a positive example of how **collaborative efforts between the private sector, implementation agencies, and local authorities can contribute to creating greener, healthier, and more sustainable urban environments,** while encouraging continued investment in ecological initiatives in the future.





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