

COMPLETION REPORT



METRO GREENZONE

WITH



NIPPON KOEI INDIA PVT. LTD.
Consulting Engineers

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Thematic Area : Increasing Greenery

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Organization Background

Thuvakkam is a Non-Governmental Organization (NGO) working towards the betterment of society. Started in the year 2014 by a group of passionate young minds, Thuvakkam is a self-driven organization envisioning a better world for the future generations. The entire team truly believes that the best way to change the society is to be the change one wishes to see.

Vision: To uphold the virtues and create a better society.

Mission: To create awareness on various social issues and to work towards a clean and green environment to enhance societal well-being.

Thuvakkam's operations for the past 7 years have helped it grow into a multi-domain organization. Thuvakkam's three domains of operation are Environment, Education and Humanity.



Each of these domains have a stack of events and causes that target particular aspects of society. These activities have been molded by the members and volunteers who play an active role in the development of the organization. Thuvakkam has looked to the people to analyze their needs and requirements to better cater to them. This has helped Thuvakkam grow into a driven and vibrant organization that welcomes and works with people from different sectors.

Thuvakkam is a registered Non Government Organization under Section 10 of the Societies Registration Act, 1975. Thuvakkam possesses 80G and Form 12A as per the Income Tax Act, which makes donations made to the organization up to 50% tax exempt.



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Project – Metro Green Zone

Executive Summary

The Metro Green Zone (MGZ) Project is an effort by Nippon Koei India Pvt. Ltd. in collaboration with Chennai Metro Rail Ltd. (CMRL) to greenify metro stations at Chennai. The metro stations in the city are split into concourse and platform levels, with the publicly accessible areas being at, above, and below street level at many places. This makes the entire structure of concrete and tiles drab and without clean air circulation. The MGZ project is a step in ameliorating this situation by introducing greenery and sustainable measures at the stations. Namely, the project has primarily been implemented at the following three metro stations:

- Alandur Metro Station
- Chennai Mofussil Bus Terminal (CMBT) Metro station
- Chennai Central Metro station

In addition to the greenification approach, sustainable water dispensers have been placed at the following stations:

- Alandur Metro Station
- Koyambedu Market Metro Station
- Airport Metro Station

This project is an amalgamation of different ideas, taking a multi-faceted approach to introduce greenery into the stations, as well as promoting environmental conservation and sustainability.

Thuvakkam's scope of Work

- Placing Sciophytes (Indoor plants) in ceramic pots at all 3 stations
- Posters of environment conservation and awareness at all 3 stations
- Painting mural art at 2 stations (Central, Alandur)
- Installation of Moss Panel at Central station
- Air to Water generation machines at 3 stations

Adherence to Objectives & SDGs

Objective

The project's primary objective has been to introduce greenery into the concrete and plain structures of the metro stations. As an indispensable means of transport for the general public, thousands of people travel via the metro trains and through the stations every day. By promoting environmental conservation and placing plants, the daily commute will be improved for each person. Providing clean air and improving the outlook of the stations, changing the cityscape and leaving an impact on the passengers.

SDGs

Thuvakkam's projects are initiated with United Nations' Sustainable Development Goals in mind.



MGZ tackles multiple UN SDG goals. As a proponent of environment conservation, the placement of plants, awareness posters, mural artwork meets SDG Goals 11 & 15. The water dispensers produce potable drinking water from the air's moisture, making it sustainable and meeting the SDG Goals of 6 & 11.

Implementation

Thuvakkam has implemented this project in multiple stages. Each phase of operations was carried out with the permission and support of NK CSR personnel, CMRL officials, and Metro station controllers and employees. Thuvakkam has engaged artists and labourers to carry out the core of the plantation and painting activities, providing livelihood support for the people of different communities.

Sciophytes at Stations

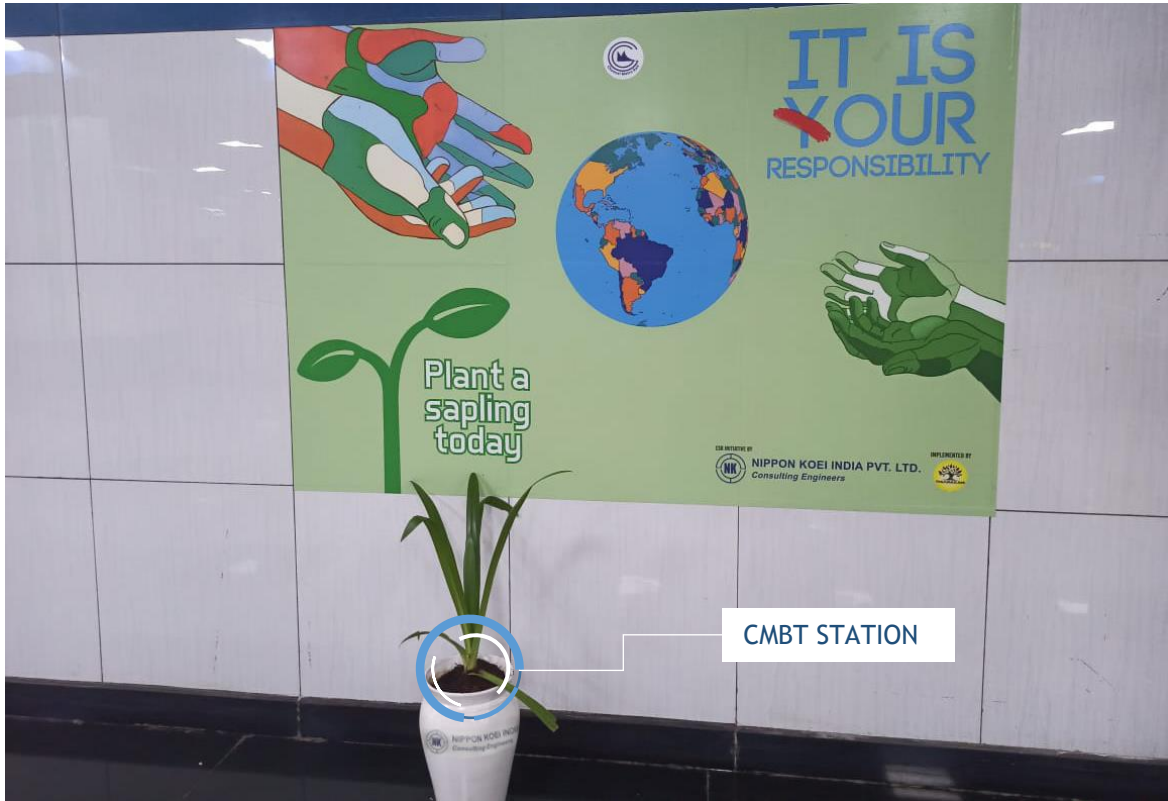
Sciophytes are indoor plants that require minimal sunlight and sparser water requirements. These plants thrive when placed indoors, even in the underground platform levels, as they do not require constant sunlight for photosynthesis. They carry out their regular activities, providing oxygen and moisture to the surroundings. The list of plant species placed at the stations are detailed in the following table.

Snake Plant	Aloe Vera
Zanzibar Gem	Areca Palm
Rubber Plant	Lady Palm
Lucky Bamboo	Arrow head Plant
Foxtail Fern	Marble Pothos
Peace Lily	Golden Pothos
Spider Lilly	Dracena ruby
Steploia Veriegata	Dracena mahatma
Puppet Lilly	Dimont bachiya varigata
Eranthimum	Dimandbachiya aglonima
Crinium lilly	Steploria green
Philodeudrem	Gongo green red
Pidilanthas green	Song of india (green & verigated)

These plants have been placed in ceramic pots, fitting their root structure requirements, growth size and light requirements. The pots have also been placed on water drip trays to prevent any excess water from seeping onto the station floor.



Showcase





CENTRAL STATION





Raising Awareness

Going hand in hand with the plants placed at the stations, the people will also view posters on the walls of the stations. The posters designed are both in English and Tamil, spreading the message more effectively. They have been designed under the theme of environment conservation, and informative content. Under the theme of conservation, there are statistics, quotes and slogans promoting sustainability, reducing plastic usage, the need for water conservation, planting and caring for saplings, and other messages. The informative posters are centered around the sciophytes placed at the stations, detailing their name, identifying characteristics, and their applications in day-to-day life and medicine.

Some of the posters at the stations are showcased in the following segment.

Showcase – Environment conservation posters





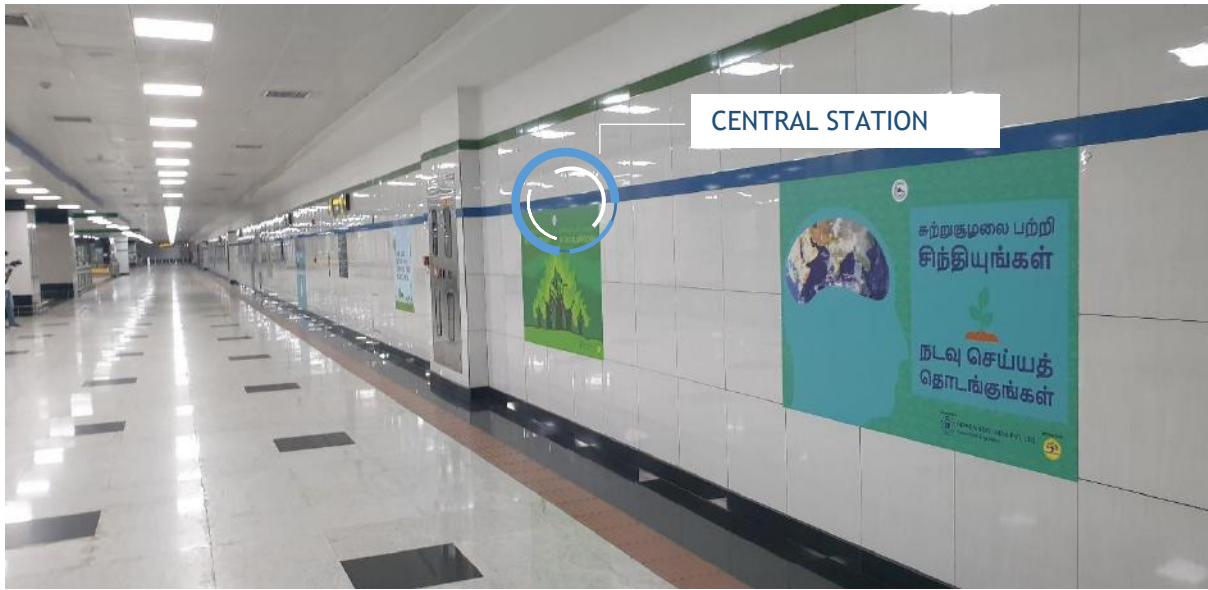
CMBT STATION



ALANDUR STATION







Showcase – Sciophytes information poster







sciophytes
at the
station





Foxtail Fern

 Adds humidity to the air, providing moisture to dry indoor areas

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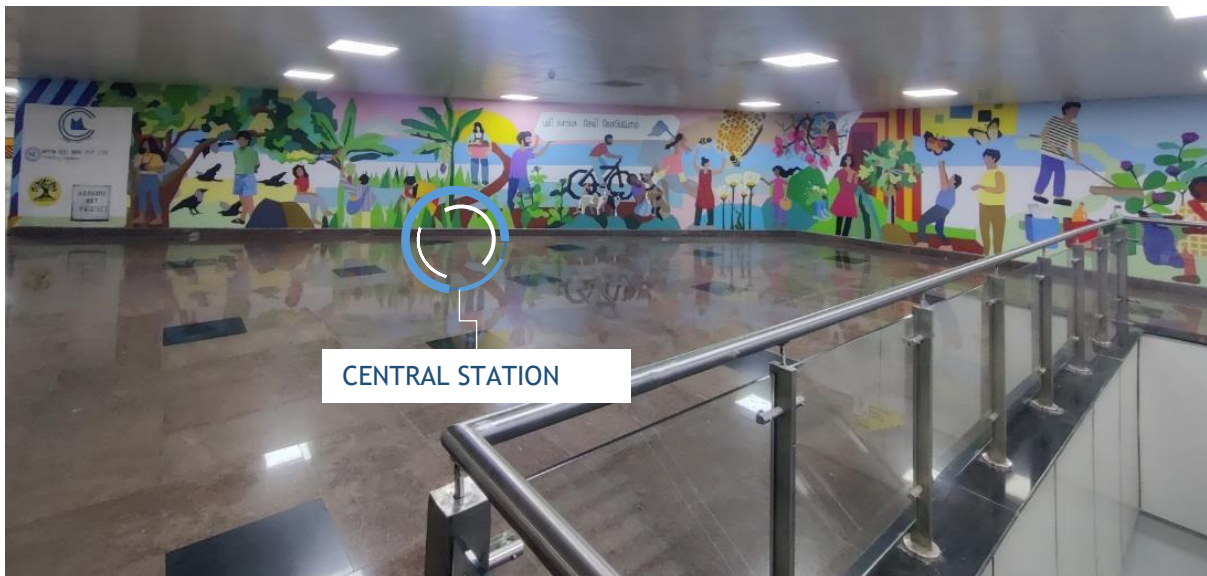
Mural wall art

Art is an excellent medium for conveying ideas to the people in a manner that leaves a lasting impact. Along with the posters and the plants, the need for environmental conservation and its awareness is paramount. Through Mural art work, the concepts of sustainability and awareness were imparted to the people in a creative manner. The Mural at Central Metro station was designed and painted on the concept of sustainability, and spans over 1,700 sq. ft. The artwork at Alandur Metro station is a massive painting at the entrance, spanning over 2,100 sq. ft. It is visible from the main road for all travelers to marvel at. Their images are showcased below.

Showcase – Central Mural Art Work Concept



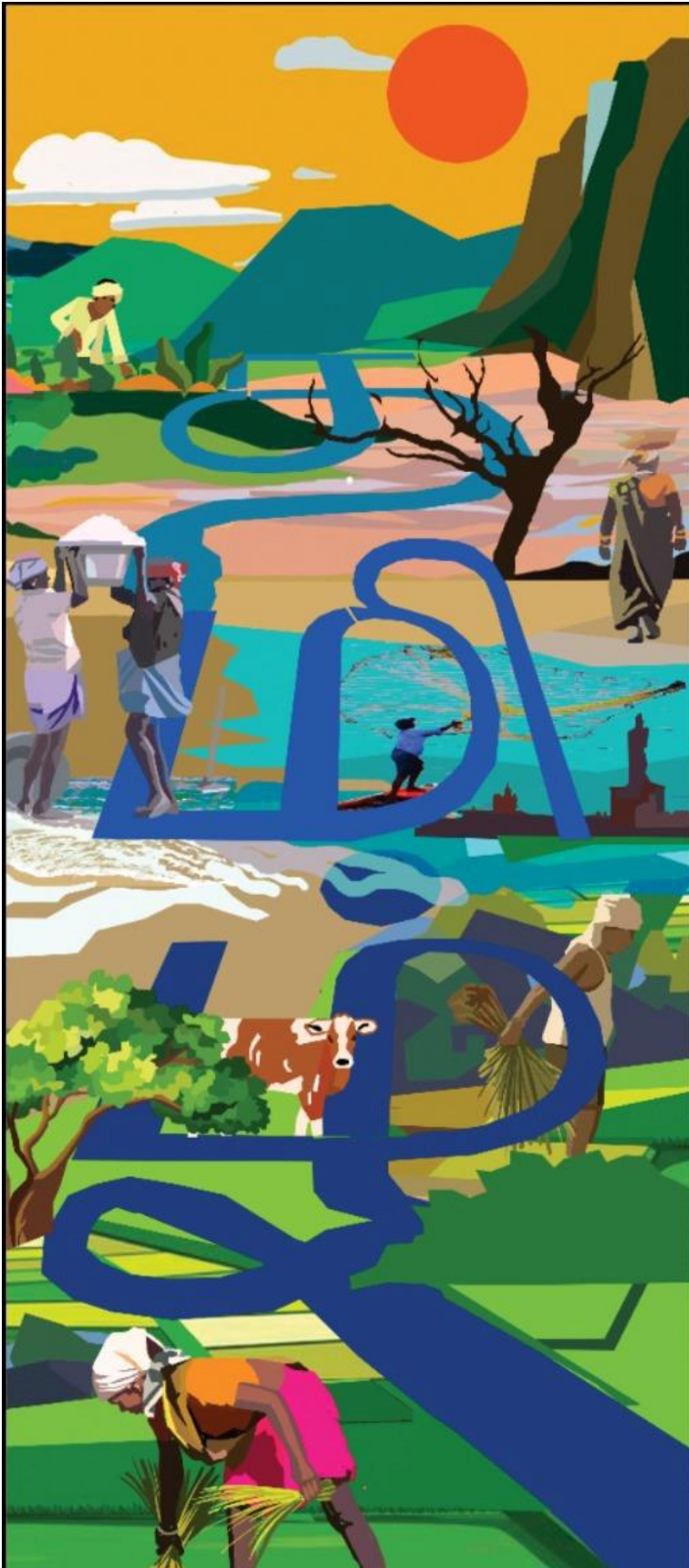
Mural Artwork at Central Station Entrance







Showcase – Alandur Mural Art Work
Concept



The Artwork at Alandur Metro Station is centered around the theme of “ஐந்திணைகள் (Ainthinaigal)”, the five landscapes classified in the Tamil language.

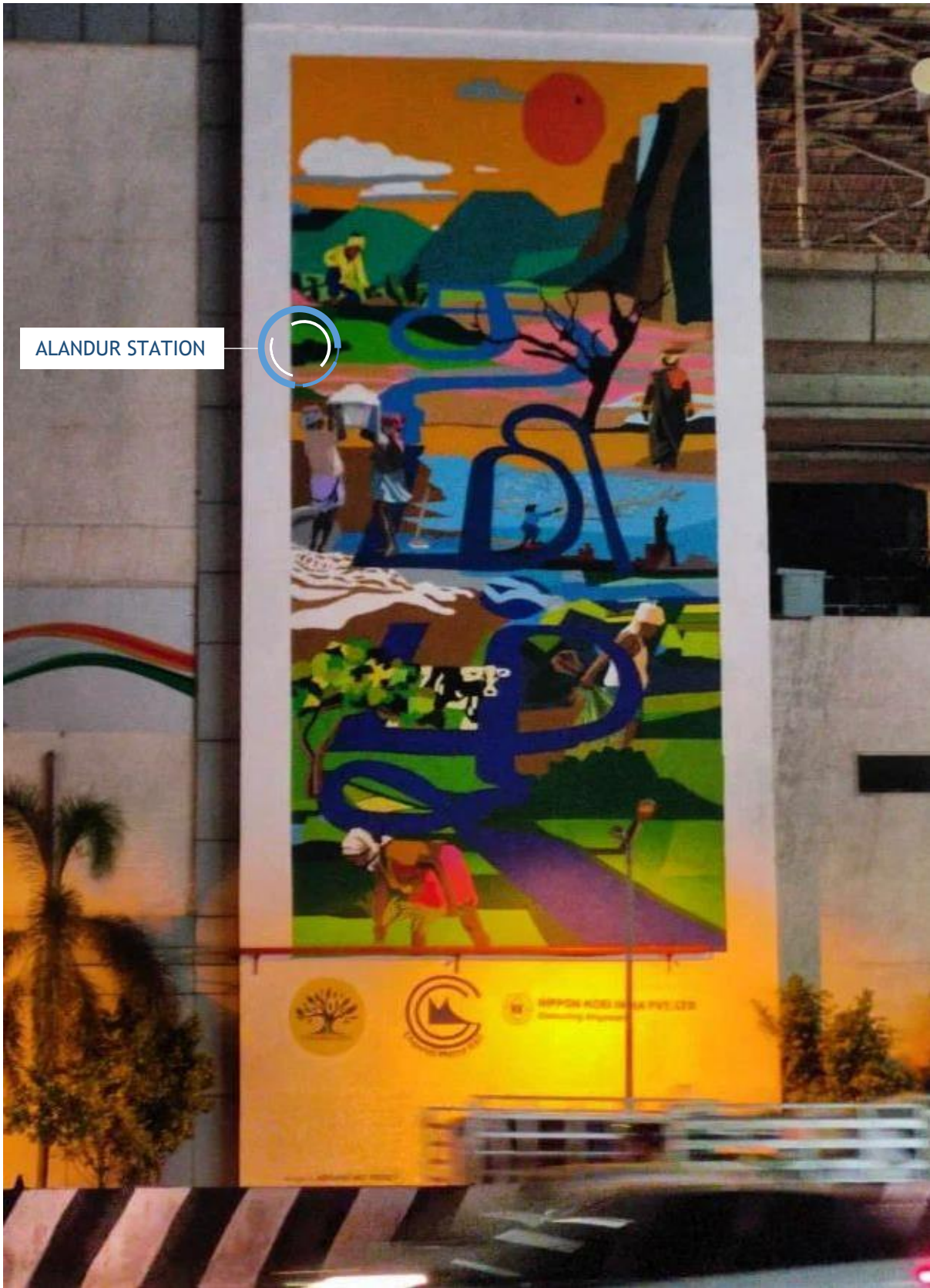


Mural Art work at Alandur Metro Station





ALANDUR STATION

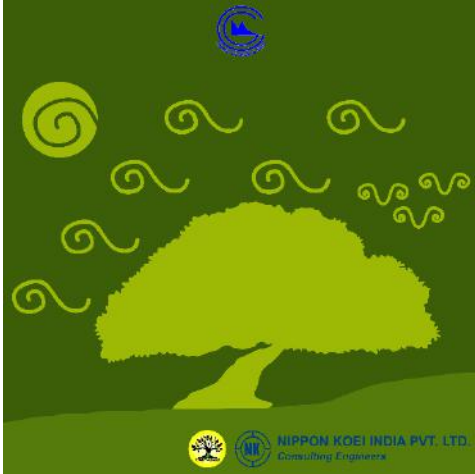




Moss Panel

The Moss Panel is made from living moss plants. It is a type of lichen, that is grown organically and structured into the desired shape and form. The moss panel has been placed at Central Metro station, beside the ticketing counter, viewable by all commuters.

Showcase



Sustainable Water dispenser

The commuters in the urban area tend to purchase single-use plastic bottles rather than bringing their own water bottles. This is due to ease of access to stores and lack of drinking water in public spaces. The installed Air-to-Water machines produce potable water by extracting moisture from the air. The machines are capable of producing 100L of water in a day, and paired with a dispenser, the people can quench their thirst easily. This is a sustainable solution for the plastic problem.





Theory of Change

Thuvakkam's projects lead to sustainable change from within the society. The project will engage local communities through awareness and knowledge, thereby creating a sense of purpose and understanding within everyone in the area. The project's growth will also impact the future generations of people and organisms alike, strengthening the bio-diversity and benefitting the locality.

- **Population:** Daily commuters of the Chennai Metro Rail [~31 Lakh per month]
- **Threshold:** Placement of plants, posters, water dispensers, and painting artwork
- **Target:** Improve oxygen at Metro stations and raise environment conservation awareness
- **Timeline:** The plants will be maintained by Thuvakkam with weekly watering and care

Impact Assessment

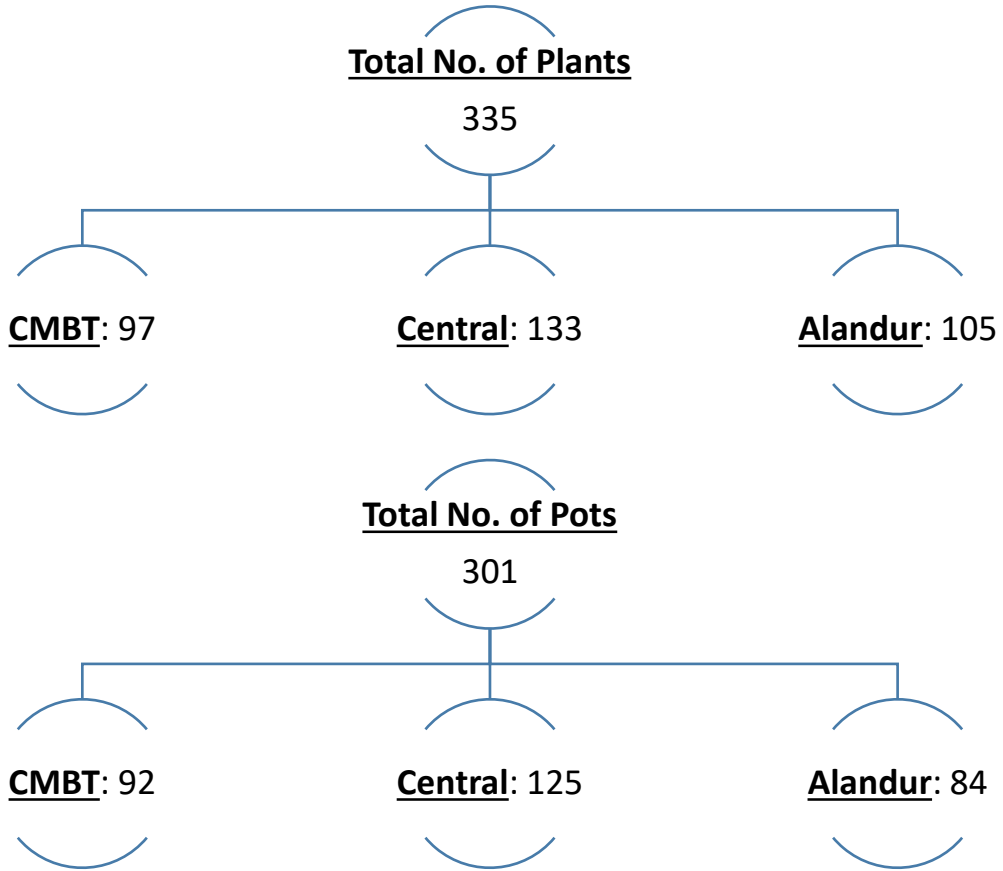
The Metro Green Zone project will cover different aspects of preserving the environment and spreading environment awareness amongst the public using the Chennai Metro Rail transit system. The average footfalls in the Metro stations is roughly 31 Lakh per month, with the numbers rising every month. The sciophytes placed at the 3 stations will be taken care of by Thuvakkam, with weekly watering and monthly de-weeding. They will also provide moisture to the air, and improve breathability by producing oxygen in the station premises. Every pot has also been placed on a drip tray to catch any water spillage. This will also prevent slippery floors and ensure safety for the people on the Metro station premises. The pots will also be branded with the logos, and a warning marker to do not water.

The posters placed at all 3 stations will promote environment conservation and implore the people to change and live a sustainable life. As the posters are within the premises, they will last over 5 years without any quality issue. Similarly, the moss panel will also become an iconic identifier at the Central Metro station. The Mural artwork paintings at Central and Alandur metro station has already garnered much praise and appreciation from the public, as it supported transgender artists. The paintings also promote sustainability and environment conservation, and visible for the people to admire.

The Water dispensers that generates drinkable water from the moisture in the air is capable of producing 100L in a day. This is a sustainable approach to providing water to the people, as it eliminates purchasing of plastic bottle by the commuters, and has a very low carbon footprint.



The Project in numbers



Mural Painting: 2,300 Sq. Ft.		Air to Water Dispenser		
Central: 1,700 Sq. Ft.	Alandur: 2,100 Sq. Ft.	Alandur Metro	Koyambedu Market Metro	Airport Metro
Awareness Stickers: 6,000 in Sq. Ft.				
Central: 3,000 Sq. Ft.		CMBT: 1,900 Sq. Ft.		Alandur: 1,900 Sq. Ft.



Challenges & Solutions

Permissions & Approvals

The Metro Green Zone project is implemented by Thuvakkam under the guidance of Nippon Koei India Pvt. Ltd. at the premises of Metro Stations, operated by Chennai Metro Rail Ltd. For the approval of designs, plants, and artwork, as well as permissions to work on the floor of each station, officials had to be contacted through the proper channels. With the expert help of Nippon Koei CSR officials, it was possible to execute the project with the requisite approval letters and permissions.

Procurement of Pots

To meet the standards set for the indoor plants placed at each of the stations, ceramic pots were obtained from outside state. Multiple issues arose during the packaging, handling, transport, and delivery of the shipments. There was also one valuable set of pots that were lost due to a vehicular accident. In order to proceed with the project, the associated vendors were contacted and extra care, new packaging standard, better pots, and smaller dispatches were arranged.

Safety Standards

In order to execute the stickering at stations, Mural artwork at Central and Alandur station, and placement of pots, safety standards were drafted and followed by Thuvakkam. This involved obtaining permission from security personnel, working without hindering the people's movement, frequent cleanup after each phase of work. For the scaffolding that was erected for the Alandur painting, the work was handled in a concise manner, with good quality materials and rigid construction. The painters were provided with safety vests and safety harnesses for extra protection.