2024

2025

CHENNAI RESILIENCE INITIATIVES

PROJECT UPDATE

CHENNAI RESILIENCE CENTRE

Atlantic Council Climate Resilience Center

OKAPI

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Gratitude To Partners

Early on its journey, Chennai Resilience Centre (CRC) recognised that it is critical to have a diverse and multi-disciplinary range of partners having a shared vision for its programmes to be successful in the long term. CRC has been closely working with the following list of organisations for its programmes - Chennai Urban Farming Initiative, Urban Ocean and the Water as Leverage Programmes.

Working in a Group, Photo Credit : Karolina Grabowska on Pexels

CHENNAI URBAN FARMING INITIATIVE (CUFI)

Core Strategic Team

CHENNAI RESILIENCE CENTRE

CARE EARTH TRUST
Biodiversity People Conservation

OKAPI

Netherlands Enterprise Agency

Atlantic Council
Climate Resilience Center

RESILIENT CITIES NETWORK

Implementation & Support

SEMPULAM SUSTAINABLE SOLUTIONS

POSHAN Abhiyaan
PM's Overarching Scheme for Holistic Nourishment
सही पोषण - देश रोशन

TNULM
TAMIL NADU URBAN LIVELIHOODS MISSION
Empowering Lives

TNGCC
Tamil Nadu Green Climate Company

EARTHONOMIC ENGINEERS

IRCUC

ROKA

Valmiki Nagar Association

AGS Colony Welfare Association

Kalakshetra Colony Welfare Association

CHENNAI URBAN FARMING INITIATIVE (CUFI)

Implementation Teams	Names
Care Earth Trust	**Founder & Managing Trustee :** Dr. Jayshree Vencatesan
Chennai Resilience Centre / Okapi Research & Advisory	**Chief Resilience Officer :** Mr. Krishna Mohan Ramachandran **Lead Researcher/Advisor :** Dr. Parama Roy **Senior Project Manager :** Mr. Ramamoorthy **Programme Manager :** Mr. A. Ramachandran **Senior Research Associate :** Ms. Akshaya Ayyangar **Project Coordinator :** Ms. Srimathi Balasubramani **Jr. Research Associate :** Ms. Rithika Vivek **Jr. Research Associate & Communications Manager :** Ms. Ayesha Ajmal **Interns** Mr. Aaryan Lodaya - Grinell College, Iowa, USA Ms. Olivia Stoetzer - Thomas J. Watson Fellowship
Sempulam Sustainable Solutions	**Founder & CEO :** Dr. K. Vijayalakshmi **Agri Business Manager :** Ms. Parimala Thirumurugan **Senior Consultant :** Mr. Subramanian **Procurement Manager :** Mr. Vetriselvan **Program Assistant :** Ms. Janani Sivajothi
ICDS - Integrated Child Development Services, Government of Tamil Nadu	**Project Officer :** Ms. Krishnaveni **District Coordinator :** Ms. Pavithra, Ms. Saral **Additionally, CRC extends heartfelt gratitude to all of the Chennai District's Block Coordinators, Supervisors, Teachers and Helpers**
TNULM - Tamil Nadu Urban Livelihoods Mission	**State Mission Manager :** Mr. Subash Babunath
TNGCC - Tamil Nadu Green Climate Company	**CEO** : Dr. Viswanathan **Director, Environment Department** : Mr. A.R. Rahul Nadh, I.A.S.
GCC - Greater Chennai Corporation	**DC Works :** Mr. V. Sivakrishnamurthy, I.A.S. **Superintending Engineer :** Mr. Shankeravelu **Assistant Engineer (A.E) :** Ms. Hema, Ms. Devaki
IGCS - Indo-German Centre for Sustainability	**Visiting Faculty, IIT Madras :** Dr. Christoph Woiwode
IRCDUC - Information and Resource Centre for the Deprived Urban Communities	**Founder :** Ms. Vanessa Peter **Programme Head / Lead Researcher :** Dr. Nundiyny A. D.

CHENNAI URBAN FARMING INITIATIVE (CUFI)

Implementation Teams	Names
Earthonomics	**Sustainability Advisor :** Mr. Girish R. Visvanathan
Valmiki Nagar Association	**Secretary :** Mr. Santhosh
ROKA - Residents of Kasturba Nagar Association	**Treasurer :** Ms. P. Saranya **Secretary :** Ms. Janani Venkitesh **President** : Mr. Veerendra Mathur

URBAN OCEAN PROGRAMME

Core Strategy and Implementation

OKAPI

CHENNAI RESILIENCE CENTRE

URBAN OCEAN

RESILIENT CITIES NETWORK

The Circulate Initiative

Ocean Conservancy

On Ground Support

urbaser SUMEET

Bottles for Change — an initiative by Bisleri Trust

Spreco — Recycle | Renew | Reimagine

URBAN OCEAN PROGRAMME

Implementation Teams	Names
ROKA - Residents of Kasturba Nagar Association / Community Volunteers	**President :** Mr. Veerendra Mathur **Treasurer :** Ms. P. Saranya **Secretary :** Ms. Janani Venkitesh **Lane Composter Maintenance :** Ms. Revathy, Mr. Nawaz, Mr. Thyagarajan, Mr. Poongavanam **Punch - the - Plastic Collection :** Ms. Vidya, Mr. Nawaz
Okapi Research & Advisory	**Lead Researcher/Advisor :** Dr. Parama Roy **Senior Research Associates :** Ms. Akshaya Ayyangar, Mr. A. Ramachandran **Jr. Research Associate & Communications Manager :** Ms. Ayesha Ajmal **Former Field Associates :** Ms. Narmatha Santhosh, Mr. Joel Shelton, Ms. Vaishnavi Venkatesh **Interns** Mr. Santhom J Joseph - IIT, Madras Ms. Sanjitha Sekar - Sri Sairam Institute of Technology Ms. Ishwarya Rathnavel - KC High International School
Chennai Resilience Centre	**Chief Resilience Officer :** Mr. Krishna Mohan Ramachandran
GCC - Greater Chennai Corporation	**Regional Deputy Commissioner (South)** : Mr. M.P. Amith, I.A.S. **Superintending Engineer (SWM) :** Mr. K. Vijayakumar **Former Chief Engineer (SWM) :** Mr. Mahesan
Bisleri Bottles for Change	**Former Assistant Manager, Corporate Social Responsibility :** Ms. Justina Carolina **Executive, Corporate Social Responsibility :** Mr. Dhanasekar Srinivasan
Urbaser Sumeet	**Information, Education & Communication, Head** : Ms. Komal Gautham **Battery Vehicle Operators / Sanitation Personnel :** Mr. Ganesh, Mr. Raheem, Mr. Srinivasan
Spreco Recycling Pvt. Ltd	**Founder and Director :** Mr. Ranjith Singh **Co-Founder :** Ms. Krishnapriya A.

WATER AS LEVERAGE

Core Strategy and Implementation

CHENNAI RESILIENCE CENTRE

CARE EARTH TRUST
Biodiversity People Conservation

Netherlands Enterprise Agency

Water as Leverage For Resilient Cities

On Ground Support

City of 1000 Tanks

madras Terrace

OOZE OOZE OOZE OOZE

Government of the Netherlands

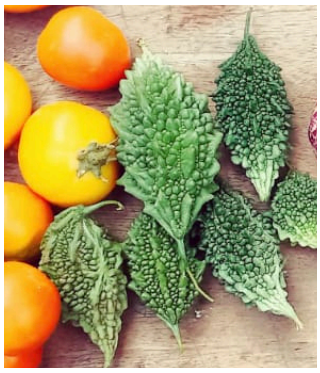
Deltares

Little Flower Convent, Chennai

TNGCC
Tamil Nadu Green Climate Company

WATER AS LEVERAGE

Implementation Teams	Names
City of 1000 Tanks	**Director, Ooze Architects :** Ms. Eva Pfannes **Director, Ooze Architects :** Mr. Sylvain Hartenberg **Former Project Lead, Ooze Architects :** Mr. Hsoc Mathai George **Director, Madras Terrace :** Mr. Sudheendra NK **Architect, Madras Terrace :** Mr. Shilesh Hariharan **Architect, Madras Terrace :** Ms. Archana **Lead Engineer, Capability Landscape :** Mr. Gilles Boulicot **Photographer :** Ms. Cynthia van Elk
Little Flower Convent, School for the Blind and the Deaf	Sister Dominic Sister Saveria
Deltares	**Expert Advisor :** Dr. Hans Gehrels **Social Inclusion & Nature - Based Solutions Specialist :** Dr. Stephanie Janssen
Netherlands Enterprise & Development Agency (RVO) and Water as Leverage	**Program Manager :** Ms. Sandra Schoof
Office of the Honorable Consul and Netherlands Embassy in India	**Hon Consul for the Netherlands in Tamil Nadu :** Mr. Gopal Srinivasan **Advisor to Hon. Consul for the Netherlands in Tamil Nadu :** Mr. Vijay Kumar **Netherlands Ambassador :** Ms. Marisa Gerards **Consul General :** Mr. Ewout de Wit **Deputy Consul General :** Ms. Anne Cremers **Senior Policy Advisor, Netherlands Embassy :** Ms. Nishi Pant
TNGCC - Tamil Nadu Green Climate Company	**CEO :** Dr. Viswanathan
TVS Capital Funds Limited	**VP Corporate Affairs :** Mr. T.A. Prasannaa
Care Earth Trust	**Founder and Managing Trustee :** Dr. Jayshree Vencatesan **Senior Research Associate :** Ms. Anjana Vencatesan
Chennai Resilience Centre	**Chief Resilience Officer :** Mr. Krishna Mohan Ramachandran **Senior Research Associate :** Ms. Akshaya Ayyangar

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Chennai Resilience Centre (CRC)

CRC is an organization dedicated to building an Enlightened, Just, and Integrated Chennai. CRC is supported by Atlantic Council's Climate Resilience Center and Resilient Cities Network (RCN).

CRC aims to promote resilience in individuals, communities, and institutions to address the challenges posed by rapid urbanization and climate change in Chennai. Its mandate is to research, develop and implement resilience-building projects for the city of Chennai. Chennai's Resilience Strategy, developed with strategy partners Dalberg Advisors and Okapi Advisory, was released by the Greater Chennai Corporation in June 2019.

The strategy consists of five pillars, 17 Goals, 86 Actions. The Five Pillars are (i) Healthy and Planned Urbanisation; (ii) Water Systems; (iii) Disaster Preparedness; (iv) Vulnerable Communities; (v) Governance Ecosystems. It identifies seven flagship programmes for the city, including the 'Chennai Urban Farming Initiative' (CUFI), Water as Leverage and projects around solid waste management which CRC has been implementing since 2020.

The Resilience Strategy is available at : https://tinyurl.com/chennaistrategy

Chennai Shore, Photo Credit : Jacob Kelvin. J on Pexels

RESILIENT CHENNAI

One Vision, To Make Chennai

Enlightened. Just. Integrated.

5 PILLARS	Healthy & Planned Urbanisation *MISSION 1* *Urbanising responsibly*	Water Systems *MISSION 2* *Carving a resilient future around our water resources*	Disaster Preparedness *MISSION 3* *Making Chennai a prepared city*	Governance Ecosystem *MISSION 4* *Together, we lift Chennai*	Vulnerable Communities *MISSION 5* *Valuing the city's vulnerable*
17 GOALS	4 GOALS	3 GOALS	4 GOALS	3 GOALS	3 GOALS
86 ACTIONS	24 ACTIONS	14 ACTIONS	15 ACTIONS	20 ACTIONS	13 ACTIONS

2024 - 25 Highlights

MoU with Tamil Nadu Green Climate Company

CRC and the Resilient Cities Network have signed an MoU with the Tamil Nadu Green Climate Company (TNGCC) to advance the three flagship programmes – Chennai Urban Farming Initiative, Urban Ocean and Water as Leverage. The collaboration will involve CRC providing technical assistance and sharing knowledge on adapting to urban heat and building city wide resilience using nature-based solutions. CRC will also work closely with TNGCC to improve solid waste management practices in Chennai, specifically focusing on reducing plastics from entering the ocean.

SEPT

Dr. Parama Roy & Mr. Krishna Mohan Ramachandran pictured here with (right to left) :
Dr. P. Senthil Kumar IAS (Principal Secretary to Government, Environment, Climate Change and Forests Department),
Dr. S Viswanathan (CEO, TNGCC)
Dr. Ramesh Ramachandran (Advisor, TNGCC) and
Mr. A.R. Rahul Nadh IAS (Director of Environment),

Chennai Urban Farming Initiative

Since 2020, one of Chennai Resilience Centre's flagship programmes - the Chennai Urban Farming Initiative has been actively transforming Chennai's urban spaces, communities, and neighbourhoods by increasing access to fresh and nutritious food, building their resilience to climate related risks such as heat.

The focus this year was to maintain the existing farms and set up additional ones in 10 schools / Anganwadis (public day care centres or ICDS centres) across the city which is currently underway. The following infographic presents CUFI's reach in the year 2024*.

144
Integrated Child Development Services Centres

Women Malis
7
who have earned over **50,000 INR**
= 1

15
Homeless Shelters

7
Government Aided Schools

2
Resident Welfare Associations

247
Teachers, children, residents and staff trained in rooftop gardening
= 100

*Since 2020, CUFI has reached 48 homeless shelters, 267 Anganwadis or ICDS centres, 3 resident welfare associations, 10 government aided schools, 3 resettlement colonies, 3 informal settlements and has trained 951 teachers, children, women from self-help groups and residents in organic edible gardening.

Impact

Chennai Urban Farming Initiative

All the gardens provide access to fresh and organic greens, vegetables and herbs. Several Anganwadis have stopped buying greens and are using the garden produce for mid-day meals. Kids love the taste of the Keerai that they harvest and are eating more of it. The larger 1000 sq. ft. gardens are yielding between 15 kg to 100 kg of produce in six to eight months depending on the nature of the site and level of maintenance.

Increases access to fresh and nutritious food

Through a collaboration with TNULM, CRC has trained several women from low - income communities, who are part of self - help groups, in organic gardening. CRC is also facilitating gardening related jobs for these women by connecting them to residents who require help. Through the program, women are learning to value (financial) independence and to be self-confident whilst also caring for their families.

Strengthens livelihood and empowers women

Gardens at the Anganwadi centres are becoming communal spaces where mothers of the kids going to the centres are learning about composting, herbal plants, segregating waste and so on. The teachers are also taking their efforts to the next level by saving seeds, recycling water for the garden and making their own compost.

Encourages pro - environmental behaviour

Anganwadi teachers and homeless shelter coordinators have reported that the gardens have improved not only their own mental health, but also that of others. Coordinators indicate an improvement in residents' emotional well-being, particularly among children and those with psycho-social issues. While Anganwadi teachers mention how the gardens relieve stress in their hectic daily lives and provide a moment of quiet and calm.

Improves mental health and well being

CRC is measuring the extent to which edible terrace gardens can help with heat mitigation and adaptation and to improve thermal comfort. Preliminary findings reveal that on an average during sunshine hours (6am to 6pm), the room directly below the garden is 2-3°C cooler than a room below an exposed terrace, with the maximum temperature difference going up to 7 °C.

Creates greener and cooler roofs

At the Anganwadis and schools, teachers are using the gardens for educational purposes. Anganwadi teachers are using the plants in the garden to teach children about shapes, numbers, colours and to identify vegetables. While, in schools, science teachers are engaging students in the gardens to learn basic science concepts.

Serves as an educational tool

Urban Ocean Programme

The Urban Ocean Programme helps cities identify and co-produce holistic solutions to waste management in their cities, with a focus on plastic waste through a circular economy approach. Chennai joined the Urban Ocean Programme in Sept 2021 and since then, Chennai Resilience Centre has been working with Okapi Research and Advisory to implement the programme on the ground.

Kids playing with waste fabric bundles at the waste collection drive in Kasturba Nagar, Adyar

- In Chennai, nearly two years of rigorous research and deliberations have resulted in the ***We Segregate project*** which improves waste segregation behaviour among the city's residents.

- Chennai was also a proud host of the first in-person Urban Ocean Summit in June 2024.

Children participating in a skit, a part of a waste collection drive conducted for community awareness in sustainability at Kasturba Nagar, Adyar

We Segregate Project

Highlights

We Segregate has been transforming waste segregation behaviour among residents through several nudges including consistent door-to-door interactions. Between October 2023 and March 2024, buildings ***'not segregating' dropped from 48% to 31%*** and those ***'segregating well' increased from 37% to 54%***. Conversations with Urbaser Sumeet conservancy (sanitation) personnel in August 2024 also corroborate this finding as they state that streets covered by the project have been consistently providing well segregated waste.

Residents collecting compost harvested from the Lane Composters in Kasturba Nagar, Adyar

364
KGs of food packaging plastic which is ~61,000* plastic bags / packets

12
Residents were awarded certificates for their stellar waste segregation efforts
= 2

5920
KGs of organic waste diverted from being dumped

1000+
Households targeted through door to door awareness campaign
= 502.5

10998
KGs of CO2e emissions reduced**

1800
KGs of compost generated through lane composters
= 600

* Taking into account that the weight of an individual plastic bag on average is 6 grams.

** Assumption : If the diverted MLP quantity ends up in a dumpsite or is incinerated, it will emit 2.9 kg of CO2e for every kg of plastic burned. Source: Global Alliance for Incinerator Alternatives & Centre for International Environmental Law

** Assumption : 1 kg of wet waste emits 1.9 kg of CO2e in a dumpsite.
Sources : Watch My Waste : Food Waste Greenhouse Gas Calculator, Australia
UN's Food & Agriculture Organization : Food Wastage Footprint Impact on Natural Resources

We Segregate Project

Ripple Effects

The urban local body, Greater Chennai Corporation (GCC), has taken a keen interest in the project and is encouraging the project's team to engage Urbaser Sumeet, the local waste contractor, to replicate the pilot in other neighbourhoods in the city.

To that end, We Segregate has begun engaging with Urbaser Sumeet to enable a working partnership that will extend support for the ongoing pilot project activities and enable long term data monitoring of segregation activities in the project site. The team also undertook a field visit to Ward 168 (Ekkatuthangal, Chennai) to interact with and observe on ground waste management activities by Urbaser Sumeet sanitation personnel.

We Segregate Team interacting with Urbaser Sumeet personnel in Ward 168 - Ekkatuthangal, Chennai

Read more about the visit here :
https://tinyurl.com/UrbaserSumeet

Urban Ocean Summit 2024

The 2024 edition of the ***Urban Ocean Summit*** took place in Chennai with over 40 delegates from 12 cities across the world (that are a part of the ***Resilient Cities Network***).

The event was spread over three days with keynote addresses by GoTN officials (the former Commissioner of GCC, ***Dr. Radhakrishnan I.A.S.*** and the Additional Chief Secretary (ACS) of the Department of Environment Climate Change and Forests (DoECCF), ***Ms. Surpiya Sahu I.A.S.***), presentations by delegates from ***Panama City, Melaka, Surat, Mumbai, Semarang*** and ***Salvador*** on their respective strategies and an insightful panel discussion on plastic reduction by experts from ***The Resilient Cities Network, The Circulate Initiative and GRID Arendal***.

On the final day of the summit, a tour of the We Segregate pilot project in Kasturba Nagar, Adyar was organized. Participants toured the sites of the various interventions including a local terrace garden (supported by CUFI) and witnessed how the various components are being leveraged at the neighborhood scale to bring sustainable change in waste management practices.

Delegates engaged in a round table discussion at the Summit

Read more about the Summit here : https://tinyurl.com/UOSummit

Top Row : Delegates at a session (left); Former Commissioner of GCC, Dr. Radhakrishnan, I.A.S. delivering the keynote address for Day 2 (right)

Bottom Row : ACS DoECCF, Ms. Surpiya Sahu I.A.S. delivering the keynote address for Day 1 (left); Participants at a terrace garden near the We Segregate project site (right)

Watch a video showcasing the summit's highlights here : https://tinyurl.com/UOSummitReel

Water As Leverage
For Resilient Cities

Water as Leverage (WaL) is an approach for building worldwide urban climate resilience through water. Chennai was one of the earliest cities to associate with the WaL programme in 2018 and a lot has happened since. A project demonstrating the WaL approach has been implemented at the Little Flower Convent, a school for children with hearing and visual impairments and the state government has provided support to prepare a larger basin level detailed project report (DPR) using the WaL approach for the Muttukadu basin. In 2024, the focus was on disseminating the WaL approach and increasing collaboration in the water sector in Chennai.

Capacity Building Workshop for Greater Chennai Corporation's Storm Water Drain Engineers : In Aug 2024, a one-day workshop was held for GCC Engineers on ***'Integrating an Ecosystem based Adaptation Approach in Water Projects'*** at the Little Flower Convent. The workshop was attended by 29 engineers from the Storm Water Drain Department. Participants had the opportunity to exchange knowledge and learn about how ecosystem based adaptation (EbA) solutions may be integrated in their ongoing projects.

Top : *Workshop participants walking through the pilot project at Little Flower Convent;*

Bottom : *Group picture of the workshop attendees*

Since the workshop was held at Little Flower Convent, the participants got an opportunity to experience the multi-functionality of the water balance pilot project as they walked through it and sat on benches above the settling tank!

Letter of Support for Neithal Muttukadu Project : The Department of Environment, Forests and Climate Change (DoEFCC), Government of Tamil Nadu has pledged its official support for the Neithal Muttukadu project. The DoEFCC believes that this project, and by extension the collaboration with the Water as Leverage Programme, will significantly contribute to the development of innovative, sustainable and climate resilient solutions for water management in the Muttukadu basin.

Water Matters Meeting : Chennai Resilience Centre, Okapi Research and Advisory Pvt Ltd and the U.S. Consulate General, Chennai organized a meeting in Jan 2025 to bring together the different countries and international financial institutions working on water in Chennai City and the Chennai Metropolitan Area. The purpose of the meeting was to create a platform where representatives from these organisations can share their resources, relationships, expertise and experiences from their projects to address Chennai's water challenges more effectively, through increased coordination. Participants included officials and experts from four countries – The USA, Japan, Germany, the Netherlands and two Multi-Lateral Development Banks – Asian Development Bank and the World Bank.

Participants of the Water Matters Meeting

Chennai Urban Farming Initiative

Produce harvested from a CUFI model farm in Velachery

Chennai Urban Farming Initiative (CUFI)

For more information on CUFI, visit :
https://urbanthottam.com/

CUFI aims to build Chennai's resilience to climate change and create healthy, self-reliant communities by improving food security and livelihoods, especially among the urban poor in the city. It was conceived with four components which complement each other.

CUFI PROGRAMME COMPONENTS

Gift a Garden

Involves fund raising and provision of mobile vegetable garden kits to vulnerable families in need.

Greener Schools

Edible Gardens in schools and Anganwadis provide access to safe and nutritious food and build environmental awareness among children from vulnerable communities.

Greener & Cooler Cities

Patchaimadi Thottams take urban farming to city rooftops with the aim of cooling the city, encouraging green behaviour, managing rain / storm water better and increasing local food production.

Green Livelihoods

Makkal Thottams aim to create green jobs for women from low income communities through encouragement of organic urban gardening.

Produce harvested from an Anganwadi garden

The objectives of CUFI are to :

- Improve food security and diet diversity amongst children and women from low-income communities;
- Provide green livelihood opportunities for women from low-income neighbourhoods through targeted skill development and training programs focused on gardening;
- Make the city greener and cooler through the introduction of rooftop and, on-the-ground edible gardens.

The focus up to 2023 was to :

- Set up organic edible gardens in institutions serving marginalized communities;
- Ensure these gardens sustain in the long term;
- Up-skill women as urban gardeners and support them to find jobs;
- Initiate larger, model gardens across Anganwadis, Schools, Homeless Shelters and RWAs;
- Understand and document primary co-benefits such as climate adaptation potential, increased access to nutritious food and green spaces and improved mental health and general well-being.

In 2024, CRC's focus was to:

- Sustain the gardens that have been set up through provision of maintenance support;
- Incentivise Anganwadis to involve children in their gardens through competitions;
- Facilitate work for trained Madras Malis and;
- Gather evidence on the role of different kinds of cool roofs in adapting to extreme heat.

Implementation Using the Mobile Vegetable Garden Kit (MVGK)

CRC is employing ***'Mobile Vegetable Garden Kits'*** to set up the edible gardens. The contents of each kit are illustrated on the right. These kits are ***modular, portable, space efficient,*** and ***scalable***. The crops have been selected based on suitability to local conditions, short duration to harvest (greens) and ability to sustainably produce nutritious vegetables.

Under CUFI, organic Mobile Vegetable Garden Kits have been distributed to government run day public day care centres, called Integrated Child Development Services (ICDS) centres or Anganwadis, homeless shelters, schools and low-income communities in Chitra Nagar, Besant Nagar, Ramapuram and Perumbakkam. The garden kits were mobilised through ***Sempulam Sustainable Solutions,*** an organisation that is committed to promoting sustainable farming and eco-friendly technologies.

At the end of 2024, CRC continues to support 168 gardens in 144 ICDS centres, 15 homeless shelters, 7 government aided schools and 2 residents welfare associations.

Produce harvested from an Anganwadi garden

Mobile Vegetable Garden Kit Components

Collaboration with GCC and ICDS

CRC has a Letter of Support from the Greater Chennai Corporation and the Chennai District Office of the Integrated Child Development Services (ICDS), which administers the Anganwadis, for all its programs including the Chennai Urban Farming Initiative. This is extremely important as it highlights GCC's and the Chennai District Office - ICDS's interest and commitment to support the implementation of nature-based solutions - vegetable gardens - to address multi-pronged issues of urban development and climate change.

ICDS District Officer, Ms Krishnaveni (centre, seated) with winners of a garden competition and Team CRC

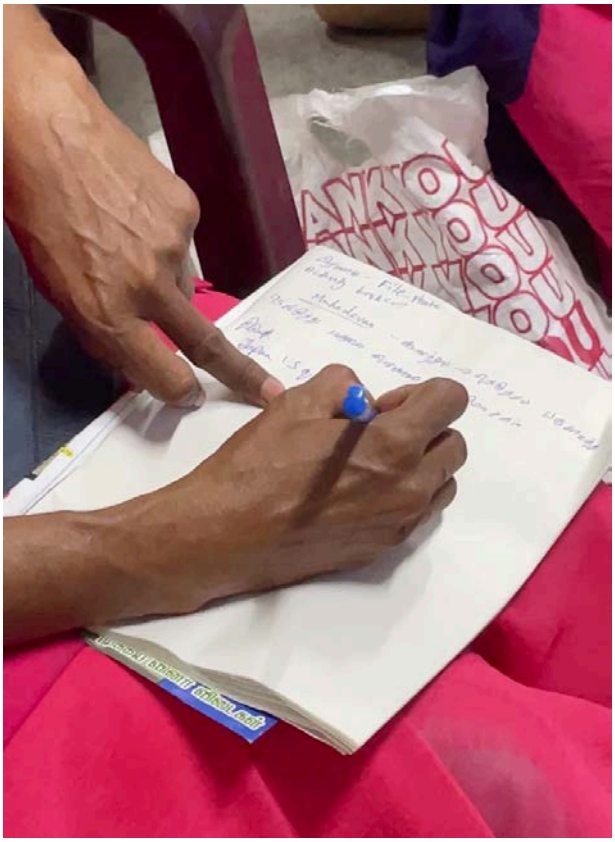
Training, Set Up And Maintenance

CUFI is not restricted to just providing edible garden kits but also includes training beneficiaries in garden set up, garden maintenance and providing maintenance support as necessary.

After delivery of the edible garden kits, CRC conducts an in-person or virtual interactive training session with beneficiaries. These training sessions are conducted by experts from Sempulam Sustainable Solutions and facilitated by CRC. Topics covered are: how to prepare soil, sow seeds, nurture the plant using bio-fertilizers, manage watering and heat and how to harvest and save seeds for the next cycle. In-person training sessions also include a practical session where participants sow seeds, set up the grow bags and prepare organic pest repellent.

For the Anganwadis, two rounds of advanced training sessions were also held based on their demand, focusing on a) garden maintenance and self-sustenance in the long-term (including topics like composting and waste segregation, saving seeds, making bio-fertilizers and manure at home etc) and, b) medicinal plants and their benefits for human health.

Training Sessions for Anganwadi Teachers



Read more about the Advanced Training sessions for the Anganwadi teachers here : https://tinyurl.com/ICDSTraining

The CRO in conversation with Ms. Sumathi in an Anganwadi in Nungambakkam

This year, CRC has continued supporting maintenance of edible gardens across the existing Anganwadis, shelters, schools, resident associations and resettlement colonies in the city to :

- Gather more robust data of benefits such as heat mitigation potential, yield and monetary savings;
- Provide inspiration and become a source of best practices for other shelters, centres and communities in the area and;
- Help showcase the potential of rooftop gardens and create a favourable impression among various stakeholder groups who can influence and inform the scalability of the project.

Visits to Anganwadis

Engaging with 7th & 8th grade children from a government school on gardening and its importance

In 2024 the following maintenance related activities were carried out :

- Maintenance kits, which contain all the elements of the MVGK except grow bags i.e. organic potting mixture, seeds, bio-pesticide were provided to all the winners of monthly gardening champions competition.

- Daily support is being provided to all beneficiaries through WhatsApp groups. These groups also act as on-site monitoring and feedback systems, providing solutions to challenges being faced and motivating the beneficiaries through a continuous exchange of information on gardening techniques and practices.

- CRC conducted a virtual refresher training for more than 120 ICDS centres on 3rd October 2024. The purpose of the training session was to re-emphasise the need for Anganwadis to maintain their gardens and to provide quick tips on how they can do so using organic farming techniques.

- In July 2024, during the second sowing season, an awareness and repotting session was conducted at a corporation school in Adyar with children from 7th and 8th grades. This school garden is being managed with help from the Residents Association of Kasturba Nagar (ROKA). This session involved guiding the children on how to identify and remove weeds, sow seeds and water the existing plants.

The following section presents stories from some of the Anganwadis and Model Farms. These ***thottams*** were selected because of their commitment to the cause of gardening and their ability to inspire.

Thottam Stories

Garden of Persistence

Location : Anna Nagar

Size : ~150 sq. ft.

Despite numerous challenges like water stagnation during rain, the teachers and students at this ICDS centre have truly taken the idea of nurturing a terrace garden and run with it. When the CRC team visited the centre in 2022, the garden had not been set up and the teachers lacked motivation to do so. At that time, the CRC team had gently nudged the teachers to set up a garden and to actively participate in the monthly competitions. Since then, the centre has come a long way. The centre's staff, comprising of teachers Ms. Devi, Ms. Prema and helpers Ms. Parimala and Ms. Manimegalai, have built a small tight knit community around their roof-top edible garden. They regularly involve the centre's students in maintaining the plants and have been able to instil a sense of duty and responsibility towards nature in these young minds, so much so that several children who have graduated onto primary school still visit the centre during weekends to spend time caring for the garden.

The centre also uses the greens harvested from the garden in the children's midday meals, and has never had to buy greens from outside since setting it up. This centre has won several awards from team CRC and the teachers also mention being invited to display their plants and present their garden as a model set up in meetings with colleagues from other centres. Here is what Ms. Devi had to say about her garden :

"We have been growing many vegetables in our terrace gardens and have especially not needed to purchase spinach from outside as the gardens provide us with adequate greens for our use in the midday meals. In the last repotting and sowing cycle, we were able to harvest 34 times from the same plant! We gain a lot of satisfaction from tending to the garden as we are able to provide such healthy organic food for our centre's children."

Garden of Positive Persuasion

Location : T. Nagar

Size : ~ 150 sq. ft.

Avid gardener and teacher at an ICDS centre, Ms. Nirmala, was able to fulfil her long-term desire to nurture a garden in her Anganwadi when she joined the CUFI programme in 2021. Since then, she and her helper, Ms. Savithri have been slowly promoting pro-sustainable behaviour among the student's parents by advising them to grow plants at home and donate saplings to the school instead of giving conventional gifts on special occasions.

Being the passionate individual that she is, she also diligently 'pays it forward', extending a helping hand by sharing knowledge and regularly advising her colleagues from other centres with gardening tips and tricks for healthy, plentiful growth. For instance, her solution on how to keep bandicoots out of the garden has been quite useful for other centres.

Here is what Ms. Nirmala had to say about her experience :

"I have always wanted to create awareness and share the benefit of kitchen gardens to my community. Now I am able to fulfil this through my centre's garden. Now, parents have started to show interest in nurturing their own garden at home and some of them have asked me for seeds to get started. I have promised them seeds during the next harvest cycle."

Garden of Mutual Support

Location : T. Nagar

Size : ~ 150 sq. ft.

The impact that localised, nature-based solutions like edible rooftop gardens have on a marginalised community can be directly observed in this Anganwadi in T. Nagar.

The garden is lovingly cared for and maintained by Ms. Anjalai (centre's teacher), the centre's helper and the community's residents. They have been utilising the garden as a source of organic subsistence, sharing vegetables / greens like Karamani, Drumstick Greens and Drumsticks with the community and adding them regularly to the children's midday meals. Ms. Anjalai also mentioned an uptick in admissions to the centre as parents are getting impressed by the garden and want to provide their children with the benefits of the organic produce harvested from it.

Here is what the mother of one of the centre's children had to say about her experience :

"My children are students at this centre. From the beginning when this rooftop garden was started, I have been helping the teachers. We harvested Keerai as the first produce and cooked it in the mid-day meal which was very tasty. Then we harvested Okra, Eggplant, Tomatoes and used it for the mid-day meals which was delicious. The teachers also gave us some produce to cook at home which was very good."

Here is what Ms. Anjalai had to say about the garden :

"The kitchen garden is very useful for us. We can never know the origins, use of chemicals etc in the greens bought outside so since we grow the Keerai ourselves in the centre, we feel very happy. We cook the organic Keerai and give it to the children (as part of their mid-day meal). Some of their parents also happily share these meals. These parents specifically tell us that they cannot access the organic greens (in the market) and they would also be very happy with the opportunity to eat the organic produce. Many parents also come up and see the garden and then enroll their kids for the mid-day meal."

Garden of
Sustainable Endeavours

Location : Valmiki Nagar

Size : 1500 sq. ft.

This rooftop edible garden is unique in that it is shaded by solar panels, installed at a height of around 8 ft. This is an important intervention that reduces the competition for space between solar and green roofs and allows them to co-exist. This roof top garden also boasts of a drip irrigation system and a misting system that is electronically controlled and set to water the plants at different times during the day. This reduces the quantity of water used and cools the temperature on the terrace surface via the misting system. Santosh and his wife Aarti have a great deal of interest in the garden and have been open to visits from residents in the neighbourhood.

Garden of
Community Sustainability

Location : Kasturba Nagar, Adyar

Size : 1500 sq. ft.

Even before CRC stepped in to help, an edible garden already existed in this building, set up by two residents with a passion for gardening. Their enthusiasm and dedication prompted CRC to help them transform the space into a model for the local community to witness and visit. Further, bio-degradable waste from the building residents is composted in a lane composter outside the building, set up through the Urban Ocean project. The compost is used in the garden, showcasing the effectiveness of a decentralised and holistic food waste management system. The garden also attracts visitors from across India and abroad to witness this circular system with visits from students of the Urban Fellows Program conducted by Indian Institute of Habitat Studies (IIHS) and delegates from the Urban Ocean Summit.

Garden of
Relief & Well-being

Location : Anbagam Homeless Shelter
Size : 1000 sq. ft.

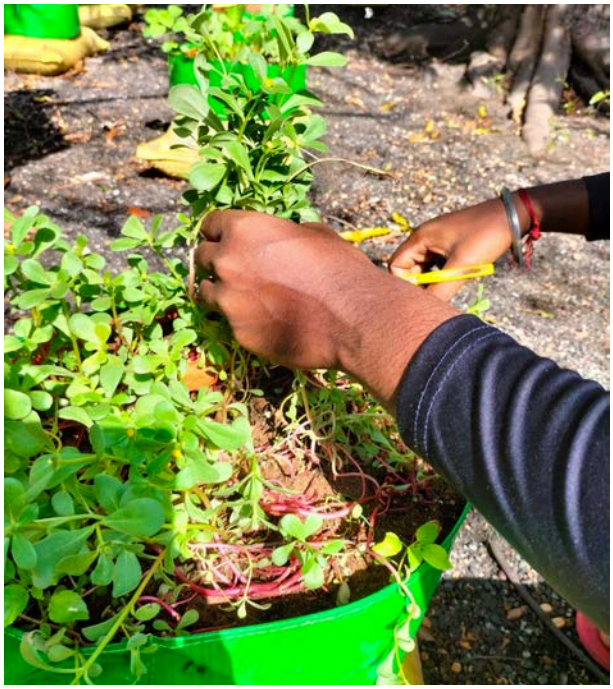
In January 2022, the edible rooftop garden was set up at Anbagam Home. The garden is being maintained by the caretaker with help from residents who are rescued women with psycho-social disabilities. Till date, the shelter has harvested more than 200 kg of greens (Keerai) and vegetables including Red Spinach (Ara Keerai), Tropical Amaranth (Siru Keerai), Common Purslane (Parrupu Keerai), Spinach (Palak Keerai), Ladies Finger, Long Beans, Tomatoes, Radish and Flat Beans. Nearly half of the produce was harvested in the first 6 months of setting up the garden as a result of which they have saved nearly Rs. 9,600 in their grocery bill and stopped buying greens from outside. The garden continues to flourish with the residents taking more interest in daily upkeep and in planting fruit trees. Further, the doctor who regularly visits the shelter said that he is noticing an improvement in the mental health of residents since the garden was set up.

Garden of
Solace & Vitality

Location : Andhra Mahila Sabha, Chennai's oldest charitable organization serving senior citizens and children with mental health disabilities by offering health care and vocational training.

Size : Two gardens have been set up at the Andhra Mahila Sabha, one directly on the ground of about 2500 sq. ft. and another using grow bags covering an area of 500 sq. ft. This 500 sq. ft. garden has been created in a reclaimed space where oil cleared from a nearby oil spill was dumped.

Since the gardens were set up in August 2022, more than 100 kg of produce have been harvested and used for cooking meals for children with physical and mental health challenges studying at the I.P.D special school on campus. These children are also being guided to water the plants in the garden.



Creating Green Livelihoods

CRC has been working with the Tamil Nadu Urban Livelihood Mission (TNULM), housed in the Tamil Nadu Women's Development Corporation (TNCDW), to provide training in organic kitchen gardening and connect women who have been trained to residents requiring garden help. The women are members of self-help groups, registered with TNULM. Since 2022, when an MoU was signed with TNCDW, 245 women have been trained and around 50 women were provided with the edible garden kits for practise at home before providing help to others.

The organic kitchen garden training for women is conducted by Sempulam Sustainable Solutions and facilitated by CRC. This program involves two sessions – a basic and an advanced workshop. Women who have attended both sessions receive a completion certificate.

The first session introduces the concept of organic vegetable gardening and the need for it, in relation to urbanization and climate change. Then, participants are taught the basics of organic edible gardening including topics like soil preparation, creating a garden layout, sowing techniques, organic pest control, water and sun management. Finally they engage in practical activities to try out some of the concepts they learnt.

The advanced session begins with a recap of topics covered in the basic session and then delves deeper into each of the topic for detailed understanding. It also covers maintenance of non-edible plants like flowers which residents would typically have in their garden.

In Nov 2023, CRC and Sempulam facilitated a residential training program for 21 women at the Sempulam (CIKS) farm in Vedanthangal where they received first hand learning experience in organic farming.

More details on the training program can be accessed here : https://tinyurl.com/TNULMTrain

Residential Training Program at the Sempulam CIKS Farm in Vedanthangal

Watch a video on the residential training program here : https://tinyurl.com/CIKSFarm

MoU with Tamil Nadu Women's Development Corporation

In 2022, an MoU was signed with TNCDW to conduct skill training sessions on organic kitchen gardening for women from local Self-Help Groups (SHGs) registered with the Tamil Nadu Urban Livelihoods Mission (TNULM). This MoU provides CRC with reach to ~100,000 women from SHGs within Chennai, and 5 million women across the state of Tamil Nadu (relevant for any women-centric initiative, even beyond CUFI).

In August 2023, CRC was honoured by Minister Udhayanidhi Stalin and TNULM for Empowering Self-Help Groups through training in Kitchen Gardening. A significant highlight of the function was the conferment of a certificate of appreciation to CRC, for its efforts to train women in Kitchen Gardening and connecting them to potential customers.

AUG

Madras Mali

The collaboration with TNULM was always envisioned as something beyond just training women in organic edible gardening. Through the collaboration, CRC wanted to support vulnerable population groups, in this case, women from low-income communities, with green jobs that would supplement their existing livelihoods to begin with and eventually could become their primary livelihood. This resulted in the Madras Mali brand through which CRC wishes to connect the women trained in organic edible gardening to potential customers seeking garden help. Two online campaigns were launched in 2023 and 2024 to understand residents' uptake regarding organic edible gardening (first campaign) and hiring trained women as gardeners (second campaign).

The first campaign was launched in January 2023, where CRC aimed to promote organic edible gardening among residents of middle and upper middle-class localities. For the campaign, CRC collaborated with resident welfare associations (RWAs) in southern Chennai such as Residents of Kasturba Nagar Association (ROKA), Valmiki Nagar, Radhakrishnan Nagar, Gandhi Nagar and AGS Colony. The campaign used existing relationships that the RWAs had with residents in their locality to promote edible gardens on the roofs, balconies, and backyards. The campaign offered to deliver mobile vegetable garden kits to residents' doorstep at a price and link them to support systems such as water proofing services, drip irrigation vendors etc. to help them set up their kitchen gardens. More than 67,000 residents viewed the campaign.

As a follow up to the first campaign, a series of five online workshops on how to grow and nurture an organic, edible garden at home was held between March and July 2023. A total of 169 people participated in these sessions. In August 2023, CRC held an in-person training session in one of its model farm in Valmiki Nagar for 25 interested residents to see and hear from the family that has set up an edible rooftop garden.

Malis at work

The second campaign was launched in January 2024, coinciding with the planting season to promote the work of the trained Madras Malis and to encourage residents to set up edible gardens. The campaign utilized search ads, YouTube videos, and display ads across Google's networks resulting in approximately 893,000 views leading to 57,500 clicks. These results indicated a positive response from the community especially for hiring trained women as gardeners.

CRC continued to provide work opportunities for the Madras Malis in 2024, by hiring them to help in model gardens and gardens at ICDS centres and by connecting them to residents who sent enquiries for garden help. The Madras Malis (specifically 16 women) have earned around INR 60,000 in total through the work opportunities created by CRC till now.

Promotional material developed for the Madras Mali online campaign

For several of the Malis, this was their first time working outside of their homes independently and it gave them confidence in themselves. Here is what they had to say :

"The program and training I received have been a big help in boosting my income, providing valuable financial support for me as a housewife. While I had reservations initially about the training, I found the classes to be quite useful. I appreciate being a part of the community and hope that more women can benefit from this project, gaining financial independence and building their confidence!" - ***Dhanalakshmi, Jan 2024***

"Gone are the days when women never used to come out. Now we are in the era of women can do anything and any work. For me, joining the self-help group has given me the opportunity to learn gardening and actually work. This has been very useful for me. I never thought I would come out of my home and am very thankful to the CRC team for pushing me." - ***Adhilakshmi, Feb 24***

SHG women engaged in peer discussions at a gardening refresher workshop in Aug 2024

The garden training that I received was very useful. I did not know that I would be able to earn Rs 500 for myself. It means a lot that I am able to earn for myself and contribute to the household.

Geetha

Feb 2024

Madras Malis at work

In 2025, CRC is planning to launch a full-scale online campaign to spread the word on this service and increase uptake across the city.

Monitoring, Evaluation & Incentivisation

Monitoring & Evaluation

Since the launch of CUFI, monitoring and evaluation has been a critical component of the programme to understand the impact it is having on the ground, and to improve, course correct, and scale the programme. A combination of tools are used to measure parameters including yield, impact on general physical and mental well-being, impact on heat mitigation, innovations and challenges. These include the following :

- ***Surveys*** conducted earlier into the programme to understand kitchen garden practices, challenges faced and the impact of kitchen gardening on physical and mental health.
- ***Focus Group Discussions (FGDs)*** conducted to gather in-depth information on the experience of beneficiaries in gardening, garden practices, yield, challenges faced, possible impact of kitchen gardening on physical and mental health and involvement of the community in the gardens.

The monitoring & evaluation report can be accessed here : https://tinyurl.com/CUFIMEReport

Read the full report detailing the FGDs here : https://tinyurl.com/CUFIFGDReport

Anganwadi children taking part in gardening activities

- ***Engagement through WhatsApp :*** CRC has created WhatsApp groups to track progress and monitor the participation of all beneficiaries such as homeless shelters, Anganwadis, women SHG members and resident welfare associations. While the number of posts each day varies, on an average the team receives up to 20 messages every day. Participants regularly post updates in the group by sharing images of their gardens, highlighting progress, celebrating harvests, and clarifying doubts.

- ***Weekly Visits :*** In 2024, the focus has been on weekly visits with the CRC team visiting around 3 - 4 Anganwadis / shelters every week to understand on-the-ground intricacies and build a rapport with the beneficiaries. These centres / shelters were rated based on certain criteria including current state of the gardens, interest shown by staff, and problem-solving ability. The ratings allowed CRC to select the centres and shelters that can be provided with further support in the future.

- ***Heat Monitoring :*** CRC has been working with Earthonomics Engineers to monitor heat mitigation impact of one of CRC's 1000 sq. ft. model farms since 2022. At this site, a 1000 sq. ft. garden, heat related parameters were analysed and interpreted for the period between April 1st to June 6th 2022. Key findings reveal that, on an average, during sunshine hours (i.e. 6am to 6pm), the room below the rooftop garden is 2 - 3°C cooler than the room below the exposed terrace space with the maximum temperature difference going up to 7°C.

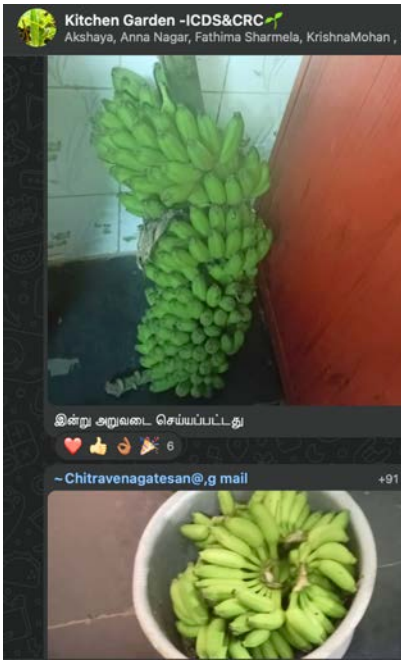
A detailed report on the heat study can be accessed here : https://tinyurl.com/CUFIHeatStudy

Additionally, towards the end of 2023, CRC decided to study the impact, costs and benefits of different types of popular cool roof solutions such as high albedo white paint and tarpaulin covers. The purpose of this exercise is to compare impact, costs and benefits of these popular options to present to policy makers.

Preliminary results from the other sites are as follows :

- ***Roof painted with high albedo paint :*** Surface temperature on the roof painted with high albedo paint is around 6°C cooler than a roof without any coating during the peak times of the day.

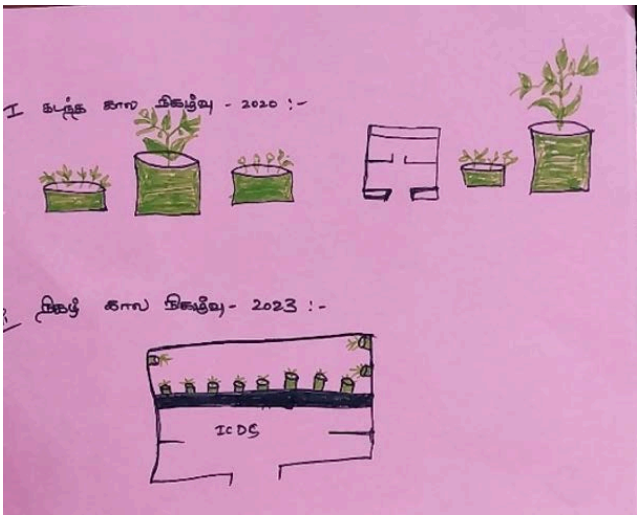
- ***Roof with tarpaulin cover :*** Temperature in the room below is ~7°C cooler and the number of electricity units consumed, drops by eight units when the roof is covered with tarpaulin.

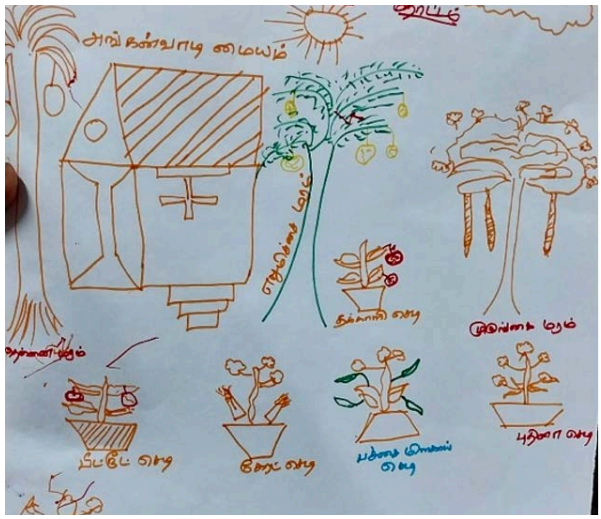


Clockwise from top left : WhatsApp group for daily engagement ; Visit to Anganwadi gardens ; FGD with Anganwadi teachers

Anganwadi Teachers' Vision for Their Gardens

CRC team asked the Anganwadi teachers to create a vision for their garden and to illustrate their thoughts through drawings. Nearly all of them said that they had a fun time doing this exercise and that it took them back to school. Several of them also had interesting illustrations which are presented below.





Incentivization

Fairly early on into the program, CRC team realized that, to ensure the gardens sustain across all Anganwadis, there was a need for some amount of motivation / incentivisation. Therefore in 2022, to keep up engagement levels till gardening becomes a habit, CRC introduced the ***Monthly Garden Champion*** competition. The friendly competition, which had a certificate as a reward, was meant to nudge teachers at the different Anganwadis to maintain their gardens well. The competition also provided an opportunity to involve the local community, including children who come to the centre, in garden related activities. It was quite a success with 30 centres being awarded the certificate over the course of 9 months.

Awarding teachers who have won monthly competitions




Awarding teachers who have won monthly competitions

In 2023, the ***Monthly Garden Champion Competition*** was replaced with the ***Composting Champions Competition*** which sought to nudge teachers into composting their bio-degradable waste so that they become self-sufficient with respect to soil. This competition was held over a year where centres had to compost for a minimum of three months and motivate the mothers in their area to assist in their efforts and segregate waste at home.

Teachers and helpers from 18 Anganwadis have been awarded thus far. As a gift, winners were provided with garden tools, a composting bucket made from old paint containers and a certificate.

In 2024, after the second planting season in June, another ***competition was started to nudge the teachers to teach their students*** about the plants. Teachers were encouraged to share videos of themselves teaching the children in a dedicated WhatsApp group and six Anganwadis have been selected as winners thus far. Winners received a set of six books on nature and gardening for children. The competition is ongoing.

The competitions have motivated the teachers and helpers to garden more enthusiastically and is ***nudging the larger community*** of mothers and families to practice more sustainable behaviours. They have also ***increased peer to peer learning*** on the WhatsApp group. However, it does fall on the CRC team to keep the motivation levels up and to think of new activities with to engage the centres. A noticeable challenge lies in the fact that the same centres win multiple times and those who are not particularly active remain less responsive despite the incentivisation efforts

Awarding teachers who have won monthly competitions

Way Forward

In 2025, CRC would like to focus on influencing public policy and community practice to include urban farming as a resilience-building strategy by leveraging robust and scientific evidence from CUFI work focused on production, heat mitigation / energy savings, and job generating benefits of urban farming. Here is a list of activities that CRC would like to engage in (contingent on support) for this year :

Add CUFI gardens at 35 to 40 more ICDS centres which would take the total number of centres supported by CRC to 10% of the total ICDS centres in Chennai District.

Continue to support existing gardens across centres, schools, shelters in the city by developing and distributing ***a handbook on how to set up & maintain an organic edible garden***.

Continue with awards that recognise the efforts of the ICDS centres. This year, CRC would like to introduce ***Kitchen Garden Recipes*** and ***Home Remedy Competitions.*** The recipes will be collated, designed and printed into a cookbook which can be displayed at the participating centres or given as gifts.

Set up ***sensors to monitor the impact of the gardens on mitigating heat*** across different geographies in the city. Use this data to build a scenario-based model to showcase how different coverage of rooftop edible gardens may impact energy savings and urban heat island effect.

Set up a ***Green-Nutrition Lab*** in an educational institute where students can experiment / research on nutritional benefits and health impact of the greens / vegetables grown.

Launch Madras Mali – a social enterprise (housed within TNULM) providing organic gardening services in the city, run by women SHG members trained and supported by CRC. CRC will soon commence a training program for shortlisted women which will enable them to make plant sapling bags from banana fibre. CRC hopes ***to extend the Madras Mali Program to Chengalpattu District as well.***

Chennai Shore, Photo Credit : Travelophile on Pexels

Urban Ocean Programme

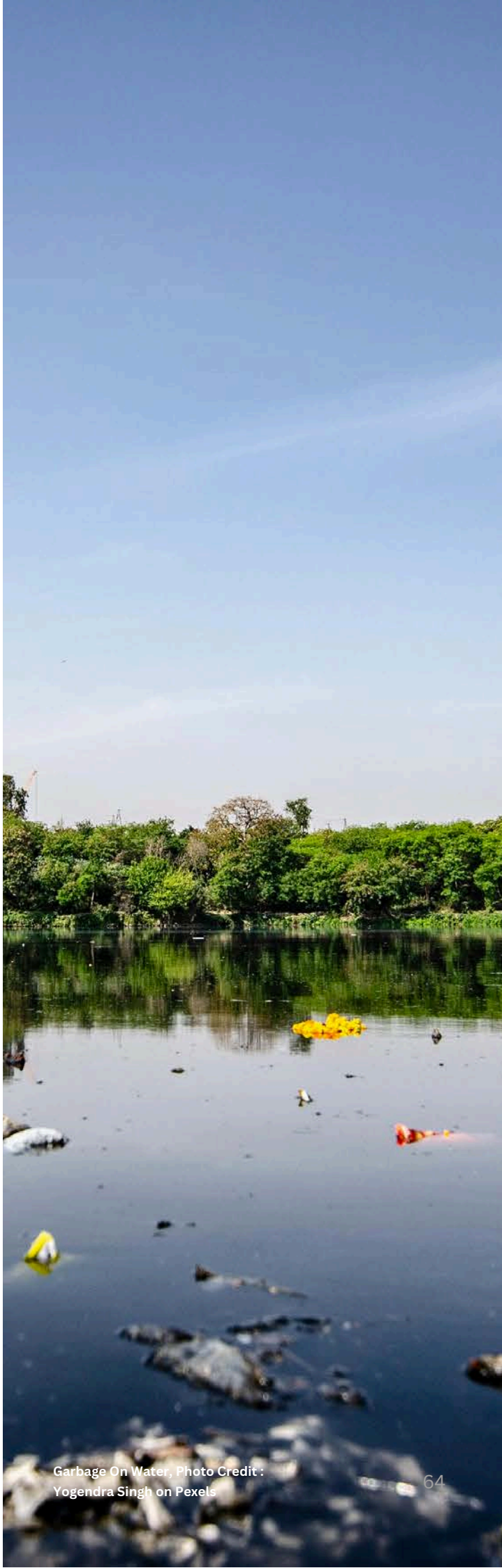
Urban Ocean Programme

Chennai Resilience Centre has been working with Okapi Research and Advisory to implement the Urban Ocean Programme, ***a collaboration between the Resilient Cities Network, Ocean Conservancy and The Circulate Initiative***. The programme helps cities identify gaps and vulnerabilities in their solid waste management systems leading to plastic leakage into the environment, specifically into waterbodies and oceans. It also helps cities to develop holistic solutions to address these gaps.

Read more about the Urban Ocean Programme here : https://tinyurl.com/RCNUrbanO

Watch a video on the Urban Ocean Programme here : https://tinyurl.com/UrbanOceanYT

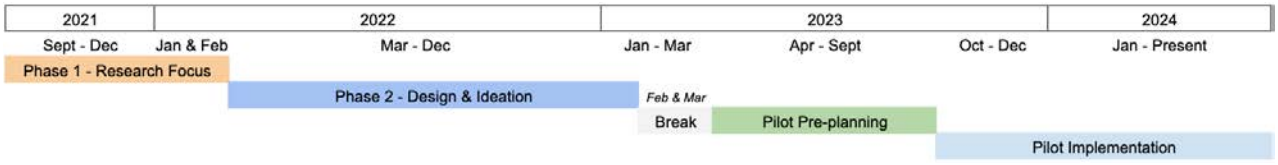
Read the Urban Ocean Programme - Project Pre-Release here : https://tinyurl.com/UOPreRelease



Garbage On Water, Photo Credit : Yogendra Singh on Pexels

The Urban Ocean Programme links to the following UN Sustainable Development Goals (as illustrated below) and to Goal 6 in the Chennai Resilience Strategy which seeks to address solid waste related challenges more effectively.

Urban Ocean Programme linkage to UN SDGs



Urban Ocean Programme Timeline

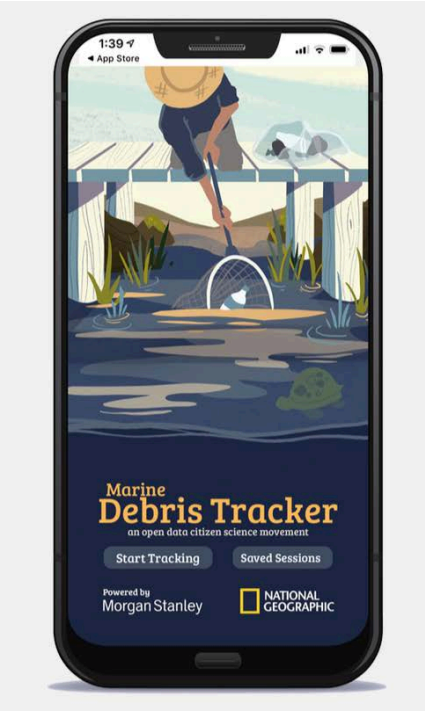
Phase I : Research Focus

Phase I of the programme commenced in September 2021, with Okapi Research and Advisory spearheading the research work that sought to assess existing gaps in the Chennai city's solid waste management system. Like other Urban Ocean cities, Okapi followed the ***Circularity Assessment Protocol (CAP)***, a methodology developed by the Circularity Informatics Lab (CIL) at the University of Georgia which enables research teams to explore the extent to which production, use, disposal / reuse of waste material follows a closed loop with minimal leakage. The methodology is structured around seven spokes that are input, community, material and product design, use, collection, end of cycle, and leakage. These spokes guide the comprehensive evaluation of waste management practices and their impact on the overall circularity of the system.

This methodology involved a combination of primary and secondary data collection including identifying and geo-tagging litter items (with the Marine Debris Tracker app) through 100 meter transect walks in nine 1 square kilometer grids across the city, collecting sample packaging material from eateries and shops, conducting stakeholder interviews across the solid waste system and a policy / literature review of secondary literature.

During this Phase, the team was also able to explore the economics, politics and governance aspects of Chennai's waste management system. The findings are compiled in a CAP report which lists material types, waste collection zones and other crucial information with respect to solid waste management in the city.

Screenshot of Marine Debris Tracker mobile application



Access the Marine Debris Tracker app here : https://debristracker.org/

Read the Circularity Assessment Protocol for Chennai, India here : https://tinyurl.com/ChnCAPReport

The team engaged in field work for Phase I

Phase II : Design & Ideation

Phase II of the project began in March 2022 by brainstorming with key stakeholders like RWAs, waste aggregators and others to identify potential opportunities which could be leveraged to design practical and fundable solutions for addressing the city's waste management challenges. The team also conducted several consultations, interviews and workshops with actors from local and state governments, academia, formal and informal waste collectors and aggregators, resident welfare associations and popular FMCG brands like Pepsi Co, P&G and ITC whose packaging litter was most commonly found. These discussions and Phase I's research resulted in two pilot projects, the first is an area-based initiative to demonstrate the building of a near zero-waste neighbourhood in Kasturba Nagar, Adyar in collaboration with the Greater Chennai Corporation, Urbaser Sumeet, and ROKA, a residential welfare association (RWA). While the second pilot focuses on better managing and strengthening the existing SWM system to trap and divert waste that is currently being dumped in Chennai's water bodies.

The combined work from Phases I and II is available in Chennai's Project Statement which can be accessed below.

Access the Urban Ocean Programme Project Statement here : https://tinyurl.com/UOProjectStmnt

Phase III : Pilot Pre-planning

In April 2023, a Roundtable Discussion was organized in collaboration with the Madras Chamber of Commerce and Industries (MCCI) to present these ideas to potential implementation and funding partners and fine tune them. Ms. Supriya Sahu, IAS, the former ACS, DoECCF Govt. of Tamil Nadu (GoTN) delivered the key note address and had an open dialogue with participants on the state government's efforts and how these can be strengthened. The discussion also explored potential space for future collaborations with the corporates, NGOs, and RWAs were also discussed to further strengthen these efforts. Key takeaways from the discussion included: the recognition of low segregation rates and the need to improve segregation behaviour among residents, the need to strengthen base line data on different waste streams, empowering informal workers and leveraging volunteer strength of companies.

The Urban Ocean Round Table with MCCI members and chief guest Ms. Supriya Sahu.

Phase IV : Pilot Implementation

In June 2023, TCI and RCN recognised the potential of the pilot idea to build a near zero waste neighbourhood in Kasturba Nagar and decided to support its implementation with an initial grant which could potentially inspire more future investment. Thus, ***We Segregate,*** was born.

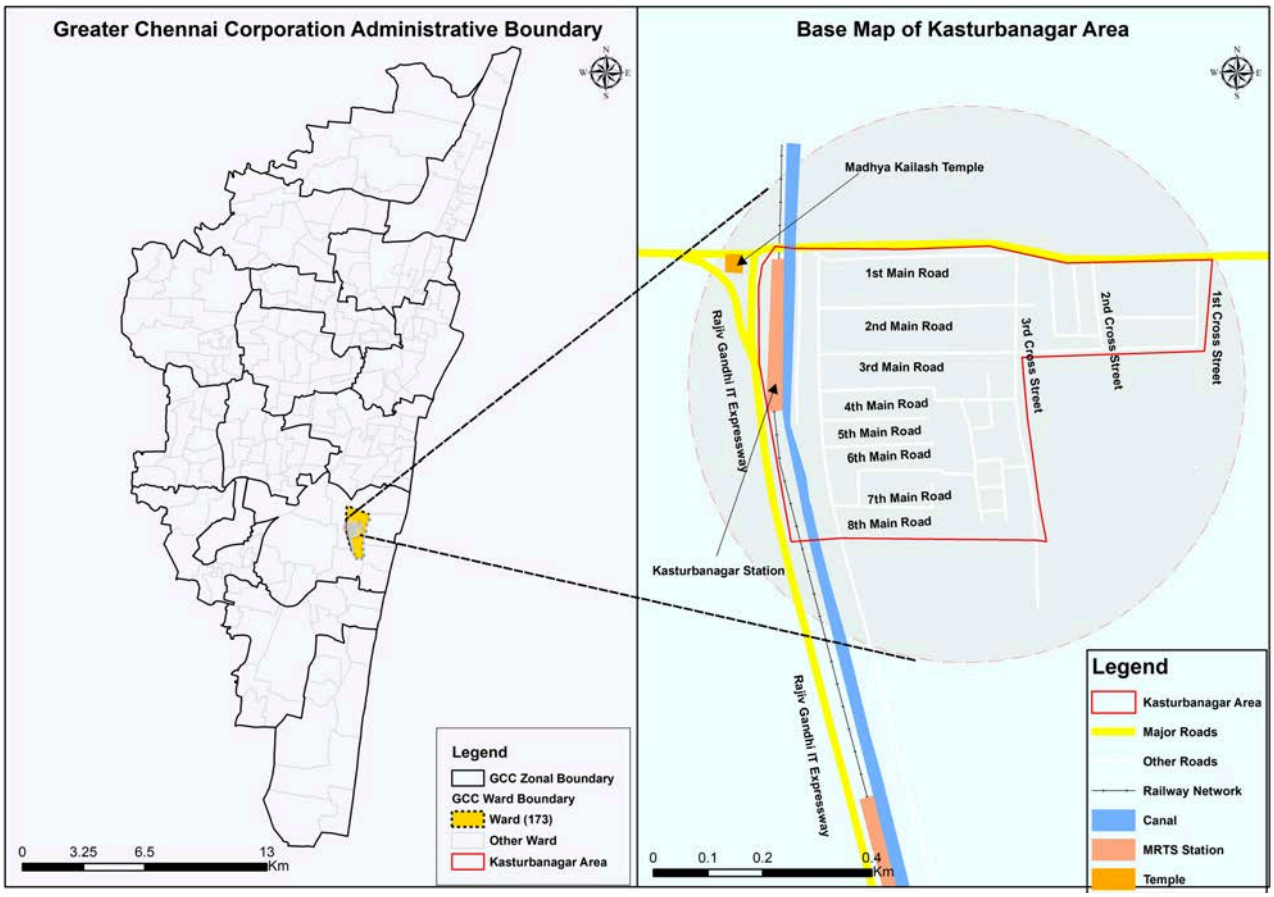
The We Segregate pilot project aims at improving waste segregation behaviour, in Kasturba Nagar, a residential neighbourhood in southern Chennai. The project is being implemented in collaboration with the Residents of Kasturbanagar Welfare Association (ROKA), Greater Chennai Corporation, Urbaser Sumeet and Bisleri's Bottles - for - Change initiative. It was conceived based on the Phase I academic and policy research work and the practical experiences of ROKA.

These experiences highlight the need to target residents both at the individual and community levels in order to achieve comprehensive and long-term behavioral change, making waste segregation second nature. Further, for sustainable behavioural transformation, there needed to be a focus on increasing people's capabilities (e.g. awareness / knowledge) and available opportunities (e.g. infrastructure) which can strengthen human motivation ultimately translating to pro-environmental behaviour.

Photo Credit : Julia M Cameron on Pexels

Therefore the pilot was aimed at maximising resource recovery and minimising the amount of waste going into the dump yards from Kasturba Nagar. This was done using multiple components with a focus on awareness building, sustainably managing / recycling different streams of waste such as organic waste and plastics, and developing public-private partnerships.

Map of Kasturba Nagar, Adyar



A version of the near zero-waste pilot project idea was recognized by NITI Aayog as one of top 75 global ideas to promote Lifestyle for Environment (LiFE).

The NITI Aayog list of 75 ideas for LiFE can be accessed here : https://tinyurl.com/NITILiFE

Pilot I : We Segregate

The main goal of We Segregate was to raise awareness on sustainable solid waste management practices in the three streets of Kasturba Nagar – 2nd, 3rd and 4th Main Roads covering approximately 1000 households and providing residents with opportunities to divert :

- some of their wet waste away from the dump yards by composting them using the three lane composters set up by the pilot project team and,
- their low value plastics, specifically Multi Layer Packaging (MLP) including single use plastic bags, through 40 Punch - the - Plastic (PtP) hooks designed by Indian Institute of Technology Madras and installed in various apartment buildings in the pilot area.

A woman throws kitchen waste, Photo Credit : Natallia Saksonova from Getty Images

We Segregate Components

Divert organic waste away from street dumspters and raise citizen awareness

Lane Composters

Metal hooks to collect food packaging waste separately for efficient recycling

Punch the Plastic Hooks

A door to door sustained awareness campaign to achieve high segregation at source

Door to Door Awareness

Waste Rally conducted in Kasturba Nagar - in collaboration with Bisleri

Lane Composters

After initial evaluation of the quantity of organic waste generated in the pilot area, it was determined that lane composters would be the right solution to divert a sizable amount of the organic waste produced.

Subsequently, the ***first lane composter was launched in October 2023*** followed by two more lane composters being installed in the following months, making a total of three.

Segregated organic waste like fruit peels, leaves and food / kitchen waste were collected from residents by ***Urbaser Sumeet sanitation personnel*** and deposited into the lane composters on a daily basis. The waste was layered with dry leaves (also collected locally) and coco-peat to ensure optimum conditions for composting. The team hired one dedicated personnel to mix and layer the different components and to generally maintain the lane composting units. Community volunteers from ROKA and other residents also graciously volunteered to monitor the units.

Resident handling compost

Each lane composter can process between ***600 and 750 kilograms of organic waste*** at a time operating in a cyclic manner to produce 200 to 300 kilograms of compost per cycle (compost is harvested once every 90 days).

The harvested compost was re-distributed for use back into the community in ***local gardens including a nearby CUFI terrace garden*** in a government middle school.

As an added benefit, the composting units also served as awareness tools, since they are publicly visible, becoming sources of continued conversations inducing a sense of curiosity in outsiders and pride in residents.

Watch a video showcasing compost harvest process here : https://tinyurl.com/CompostHarvest

Neighborhood kids helping with compost harvest

Punch - the - Plastic Hooks (PtP)

The findings from Phase I's litter transect walks, as mentioned earlier, revealed that food packaging was the most commonly littered waste - ***making up about 33% of all the litter documented***. This food packaging plastic includes soft clear plastic and Multi-layer Packaging (MLP) which is made of a composite material consisting of low density plastic layered with paperboard / aluminium to make it sturdy and leak proof.

Contrary to materials like metal, paper, cardboard or hard plastics like PET and HDPE, food packaging plastic is hard to recycle due to the composite nature of the material which needs multiple processing methods and also due to its lightweight making it a cost intensive endeavour, as the waste is often only available in small quantities and is neither clean nor dry. ***This makes this waste problematic and 'low value' and it is often not recovered by formal or informal waste recycling channels (sanitation workers / waste pickers) leading it to become a hazard for the environment.***

Plastic being punched into the hook

In order to collect these problematic, low value MLP and soft plastic, metal hooks were installed in 40 buildings across the three streets. Prior to the pilot launch in October 2023, the team interacted at length with residents and apartment associations both in person and through social media to promote the upcoming activities and garner support for installation of the pilot's various implements. These interactions brought forth an interested sub group of residents who agreed to have the PtP hook in their building complex. In addition, for the residents to understand what types of plastics to punch, an illustrative poster (as shown below) was designed and fixed near the hooks.

The 'hooked' soft plastic and MLP were collected by the ***Bisleri's Bottles - for - Change program***, door to door at first and later picked up once a month from a single location. ***Urbaser Sumeet*** sanitation personnel assisted with this operation by consolidating the MLP / soft plastics from the 40 hooks into one designated spot before Bisleri's scheduled pickups. The plastic was then transported to ***Spreco Recycling Private Ltd*** for baling and further processing.

'Punch the Plastic' poster depicting different types of soft plastics

Watch a video showcasing the hooks in action here : https://tinyurl.com/PtPHookReel

Door to Door Awareness Campaign (DtD)

While the physical interventions were designed to increase capabilities of the residents to segregate their waste, they wouldn't have been as effective if the residents were not gently and constantly coaxed / nudged, through direct and indirect communication, to adopt these habits as part of their regular routine. Thus, the team prioritised keeping a ***constant line of communication*** open with the residents involved in the We Segregate project. This was a means of social messaging and was done using both digital and in-person mediums.

Events conducted as a part of this exercise included ***a game of cricket, online quizzes, a waste collection drive, a waste rally, a crossword puzzle, a BINGO game, sustainability showcases, a children's skit, a street play and more***.

Participation was encouraged, with diligent residents who demonstrated exceptional waste segregation quality receiving certificates and event winners receiving zero-waste medals crafted from waste coconut shells.

Segregated dry waste at one of the apartments in the project site

In addition, apart from imparting awareness and garnering attention, these activities enabled the team to collect feedback from residents and clarify any queries / doubts. ***The face-to-face interactions acted as a humanising tool for the pilot project itself, fostering trust, transparency and approachability between the residents and the team.*** This camaraderie with the residents meant that the social messaging proved even more effective, with residents enthusiastically participating in the events and volunteering to take part in the pilot's activities along with their friends / families.

Top row : Resident handing over segregated waste (left); FGD with community residents (right);
Bottom row : DtD team conducting awareness session for residents on source segregation

Top row : *Waste Drive event - Street play on source segregation (left); Children participating in a skit (right);*

Middle row : *Segregated dry waste deposited at the Waste Drive event;*

Bottom row : *Cricket event for residents (left); Waste Awareness Rally conducted with Bisleri Bottles for Change (right)*

Watch a video showcasing a cricket game with the residents here : https://tinyurl.com/ROKACricket

Community Response for We Segregate

Kasturba Nagar residents have taken a keen interest in the project activities right from the beginning. This enthusiasm was evident, not just from the project's outcomes but also from interactions with residents during the DtD campaign and in person events. Here are some general feedback by the residents :

"Source segregation is key in achieving better waste management at the city level."

"To prevent clogging of drains, rivers and oceans, proper disposal of waste is important."

"By following 3 bin segregation, we can reduce waste going into the landfill."

Residents wearing garlands made out of soft plastic at the Waste Awareness Rally

ROKA's eco-friendly cloth banner advertising the Waste Drive event

"We can do it (source segregation) effectively if we start doing it at home and are strict about not using plastic and also use the veg and fruit peels as a manure for our garden."

"Well organised collection drive by ROKA. Every item had a designated collection spot to drop the same. Volunteers were helpfully guiding visitors. Children performed cheerfully in the skit, as did the folk artists. The event proved to be educational as well."

“I don’t feel guilty about my plastic getting to landfill and I can keep a count of the plastic used at my home and try to reduce it. My waste in the blue bin is almost negligible.”

- Dr. Hema

On the PtP hooks

We Segregate community events and the project's sites have also been frequented by organisations, individuals, students, corporate entities who seek to not only gain from the on-ground learnings of the project, but also to possibly replicate it in their communities.

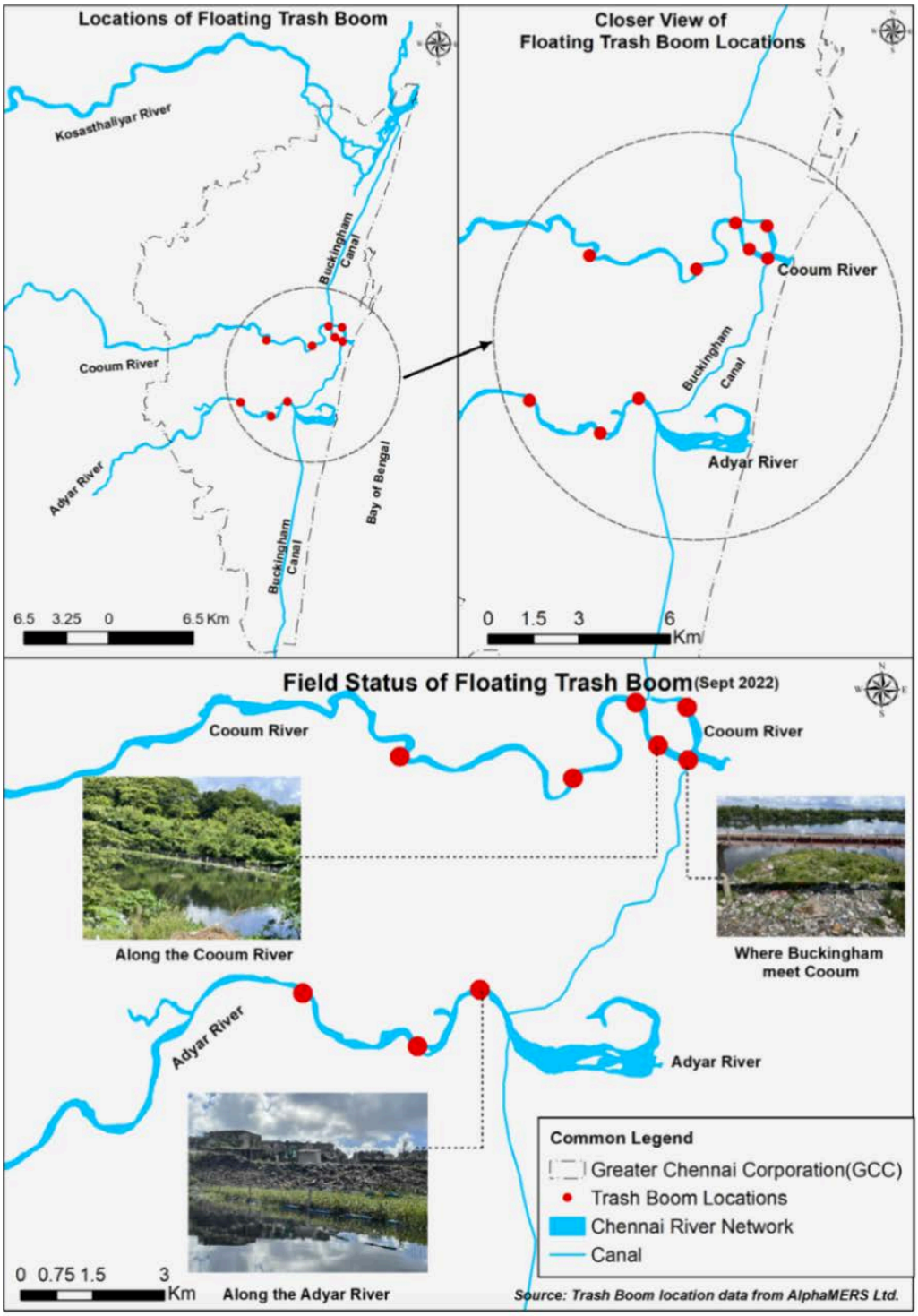
Pilot II : Clean Waterscapes for Healthy Cities

This project, centered around Chennai's water bodies, aims to :

- **Scale up the existing trash boom initiative, which was launched by the GCC and Chennai River Restoration Trust (CRRT) in 2017 to trap floating waste in the Adyar and Cooum rivers.**
- **Strengthen the operations and efficiency of the trash booms, while working towards sustainable processing of the collected waste**

Lake forest landscape, Photo Credit : fietzfotos on Pixabay

The team is working on ideating specific project components related to waste collection, waste characterization and waste processing of the solid waste collected by the trash booms. Currently, before the monsoons, the rivers are cleaned to ensure free flow of water. However, the waste collected from the process is dumped on the river bank and ends up in dump-yards, unprocessed. Research and stakeholder interviews are underway with the aim of developing solutions that involve a holistic approach to process the waste collected while also building the local economy through skill development and livelihood programs.



Map showing existing trash boom locations along the Adyar and Cooum Rivers

Way Forward

Garbage on body of water, Photo Credit : Yogendra Singh on Pexels

CRC and its partners would like to engage in the following activities for advancing the Urban Ocean Programme in Chennai :

Add three more Lane Composters and 40 more PtP hooks in Kasturba Nagar, to divert more waste away from dump yards

Continue awareness campaign and M&E to support behavior change.

Develop an illustrated and easy to understand guide on how to make your neighbourhood near-zero waste. The guide will be inspired by learnings and experiences from the We Segregate project.

Support similar efforts along with Urbaser Sumeet and other interested RWAs in the city.

Identify potential partners to kick start the Clean Waterscapes for Healthy Cities Pilot.

Water As Leverage

For Resilient Cities

Water As Leverage For Resilient Cities (WaL)

Water as Leverage for Resilient Cities Asia or WaL programme by the Netherlands Government brings together innovative financing, inclusive design, and multi-disciplinary teams to develop and implement projects that help in mitigating and adapting to climate change.

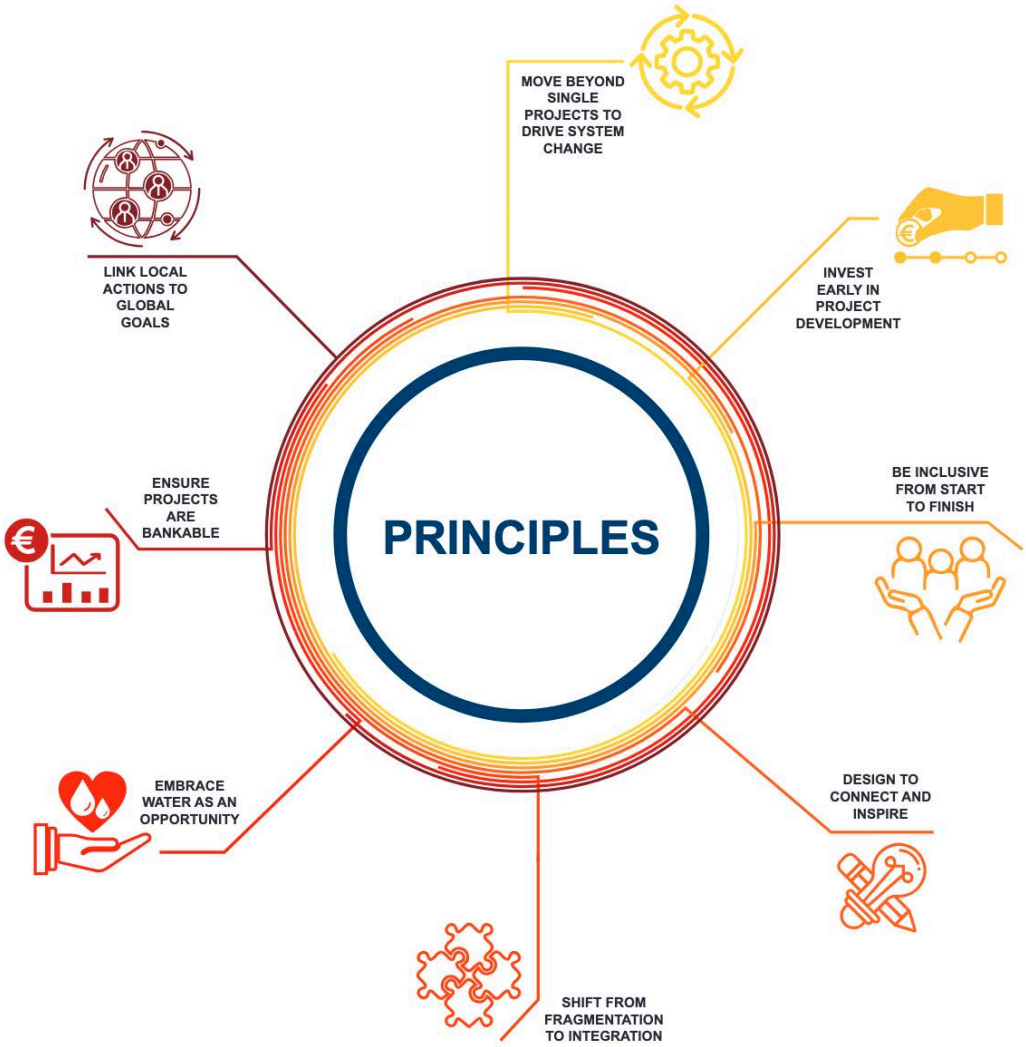
The programme, which began in 2017, was spearheaded by the former Special Envoy for International Water Affairs for the Kingdom of the Netherlands, Mr. Henk Ovink.

WaL Approach

The WaL approach is a project development approach designed to create transformative and inclusive projects for enhancing urban water resilience.

(Deltares et al. 2024)

This approach is centered around eight principles to foster resilience and drive inclusive change in water projects. These principles may be applied at every stage of the project development cycle and can help project designers / implementers perceive water as an opportunity, take an integrated lens, connect global to local, use the power of design, nurture a culture of change, and invest in the early stages of project development (Ibid.).



8 Principles of the WaL Approach. Source : Deltares

Read the full report Delatres et al. 2024. Advancing Urban Water Resilience, here : https://publications.deltares.nl/11209117_010.pdf

WaL in Chennai

In Chennai, the WaL programme is coordinated by the Chennai Resilience Centre and Care Earth Trust with the City of 1000 tanks and Neithal Muttukadu teams.

The following projects are under the purview of the WaL initiative in Chennai :

1. Water Balance Pilot Project – Nature Based Solution (NbS) showcased at Little Flower Convent
2. Water Basin Level Project - Neithal Muttukadu
3. Mylapore Heritage Project

Water Balance Pilot Project at Little Flower Convent

The City of 1000 Tanks' Water Balance Pilot, is a demonstration project showcasing the transformative capacity of the Water as Leverage programme, which envisions a water abundant Chennai. The 1000 Tanks team has created a closed loop, ecosystem based water treatment system which treats black and grey water at the Little Flower Convent, a school for 500 visually and hearing-impaired children in Chennai.

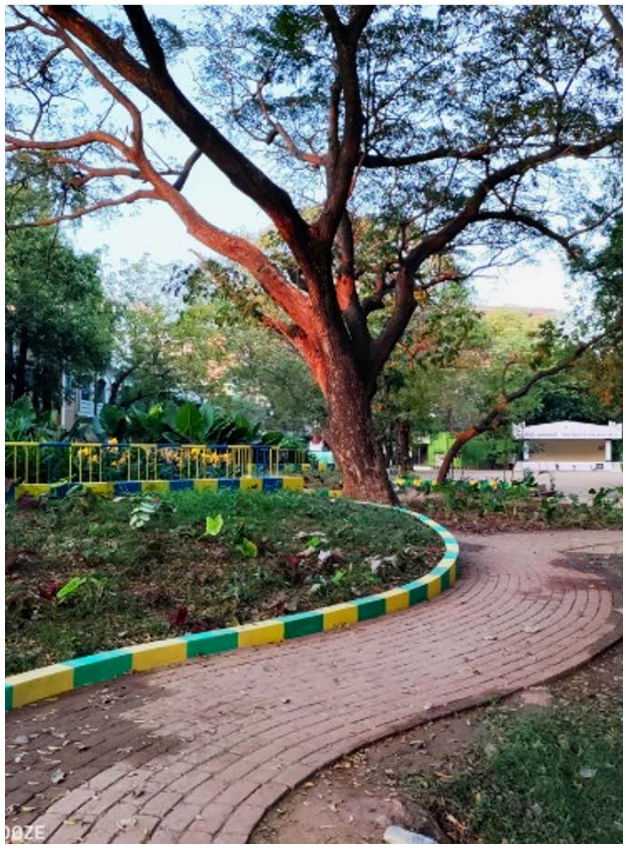
Current Status : ***In operation since August 30th 2023***

Water Balance Pilot Project Site

This system uses the root system of plants to establish a sustainable water balance model and increase climate resilience at the school. It does so by:

- treating 27,000 litres of grey and black water every day;
- repairing broken drainage infrastructure and increasing clean water discharge into aquifers;
- collecting and treating rainwater and channeling it to recharge wells thereby reducing flooding;
- creating a cooler and greener space which increases thermal comfort;
- ensuring all design of the space is multi-functional and accessible to the visually and hearing-impaired students of the school.

Water Balance Pilot Project Site



Since its inauguration in August 2023, the project has stopped the perpetual problem of sewage back-flow and improved water balance on site resulting in reduced water stress during summer and enhanced rain water management during the monsoons. The following impact has been observed :

- ***Increased waste water quality :*** The water quality after the final stage of treatment is well above the CPHEEO's standards for discharge of water into surface water sources and just below the drinking water standards.

- ***No more sewage back-flow :*** Since the project was implemented, the persistent problem of sewage back-flow has completely stopped at the school.

mg/l	Standard*	Oct/22
pH	7	7,8
BOD	30	5
COD	250	32
TSS	100	12
TN	100	24
NH3	50	17
NO3	10	BDL(DL 1.0)
TKN	50	21
TP	5	5,4
TDS		730

Water chemistry results from the project

CPHEEO manual 2013, Chapter 5, discharge of water into surface water source, which is the basis for the new revised secondary treated sewage discharge standards

- ***Depth of the water table and tanker dependency :*** The current depth of the water table is 65cm (Approximately 2 feet below the ground) which means the water table is high. During the peak summer of 2024, the water table dipped to 506cm (16.5 feet). While the data on ground water aquifers need to be analyzed in detail, a general increase in average ground water levels has been observed throughout the year since the project was implemented. Additionally, LFC have stopped buying water from private water tankers in summer since the implementation of the project. However more research is required to determine what factors have influenced this decision.

Watch a video on the project here :
https://tinyurl.com/LFCVideo

Learn more about the project here :
https://tinyurl.com/WaLPilotLFC

Water Balance Pilot

Inauguration

The LFC project was inaugurated by Thiru. K. N. Nehru, Minister for Municipal Administration, Urban and Water Supply, Government of Tamil Nadu in the presence of Henk Ovink, First Special Envoy for International Water Affairs for the Kingdom of the Netherlands, Ewout de Wit., Consul General, Kingdom of Netherlands and Michaela Küchler, Consul General, Germany. The Minister noted that the Municipal Administration and Water Supply department would be happy to coordinate on similar initiatives that can be replicated in waterbodies in Tiruvallur, Chengalpattu and Kancheepuram districts to ensure water supply to Chennai.

AUG

Minister K. N. Nehru interacting with the project team while touring the pilot project

Dutch Ambassador's Visit to Little Flower Convent

In July 2024, the Netherlands Ambassador – Ms Marisa Gerards, Deputy Consul General - Ms. Anne Cremers and Mr. Vijay Kumar from the Honorary Consul's Office visited the Little Flower Convent to interact with the students and staff of the school. Krishna Mohan Ramachandran from Chennai Resilience Centre and Archana from Madras Terrace Architects (the local project implementors) provided a brief description and tour of the water as leverage project in the school. Through the tour they showcased the effectiveness of nature-based solutions to treat waste water increase ground water recharge. The Ambassador was visibly delighted when she witnessed the vivid change in water quality before and after treatment.

Sr. Dominic and Sr. Saveria then took the group to the school for the hearing impaired and the school for the visually challenged, where Ms. Gerards interacted with the students.

JUL

Ms Marisa Gerards, Netherlands Ambassador and Ms. Anne Cremers, Deputy Consul General touring the pilot project and interacting with children at the school

Workshop for GCC Engineers

In August 2024, co-incidentally exactly a year after the inauguration of the pilot, a one-day workshop was held for GCC Storm Water Drains (SWDs) Engineers on ‘Integrating an Ecosystem based Adaptation Approach in Water Projects’ at the Little Flower Convent. Attended by 29 engineers the workshop was intended to exchange knowledge and introduce the concept of ecosystem based adaptation (EbA) solutions to the engineers who are involved in the construction and repair of SWDs in the city.

The list of topics covered included a detailed presentation on the pilot at LFC – how it helped address multiple challenges, whilst providing several co-benefits, how EbA systems can help reduce pollution load, how to identify the presence of certain plants in water bodies which are indicators of bio-health of the water bodies and the importance of understanding the hydrology of city and designing SWDs and EbA systems accordingly.

The Participants also got an opportunity to experience the multi-functionality of the pilot project as they walked through it and sat on benches above the settling tank! On the whole, the workshop was well received with the engineers wanting to know more about how they can integrate such kinds of systems in the existing storm water infrastructure.

AUG

GCC engineers interacting with experts during the theoretical session and touring the site

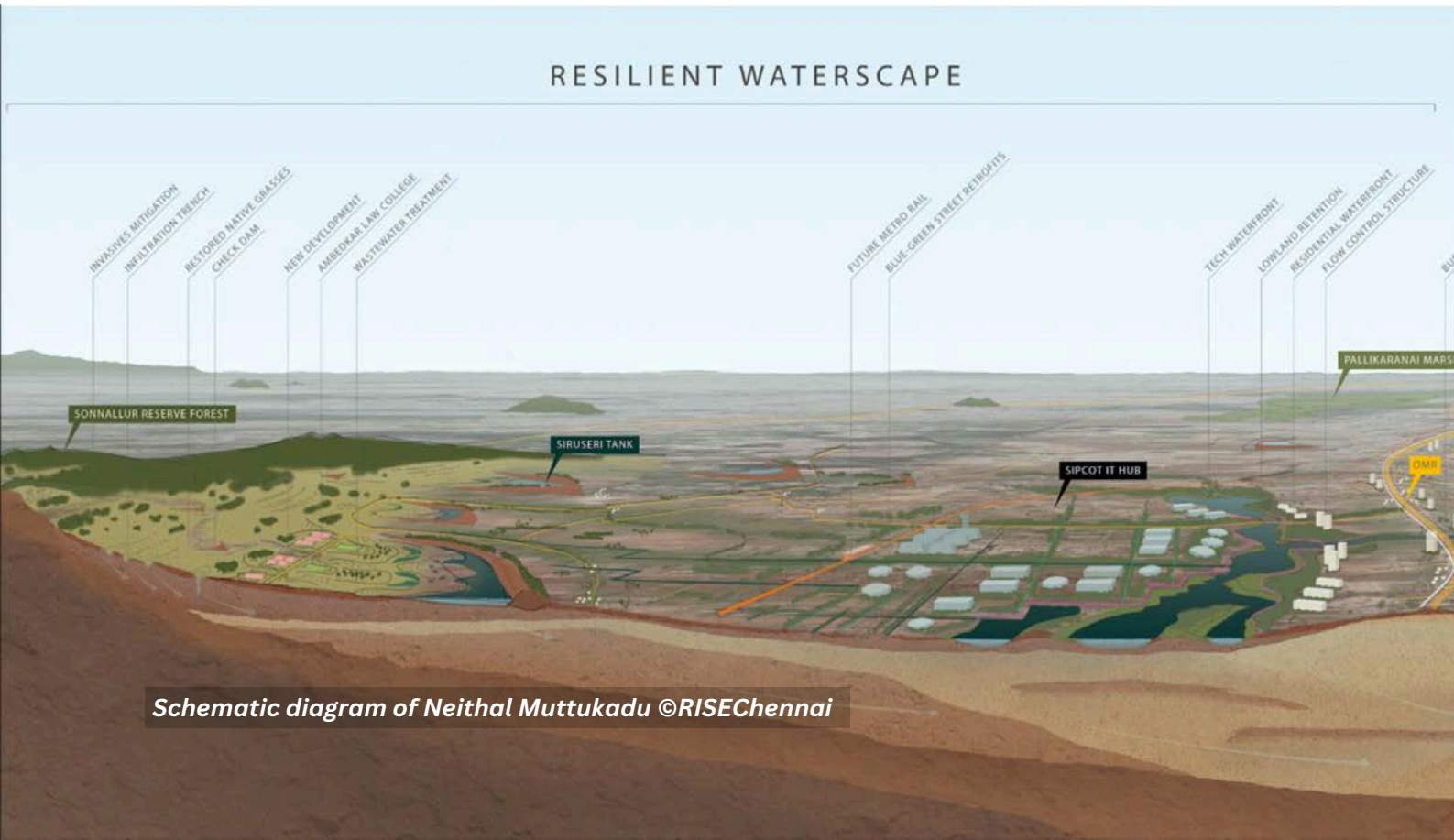
Water Basin Level Project - Neithal Muttukadu

This Water Basin Level project seeks to improve water management for the Muttukadu-Kovalam basin, a fast-developing landscape which has/is seeing billons of dollars of investments in industrial, residential and commercial real estate. It seeks to do so by deploying a hinterland-to-coast approach which allows for locale specific solutions that integrate green, blue and grey infrastructures to increase water resilience of the region. These solutions will reduce drought and flood risk, improve water availability, establish the connection between water supply systems and the water cycle, conserve and restore natural habitats necessary for meeting the challenge of future water based risks and enhance livelihoods of local communities (fishing, tourism, agrarian) by improving health of ecosystem services.

Current Status : ***The project has received official support from the Department of Environment, Forests and Climate Change.***

Learn more about the project here :
https://tinyurl.com/Neithal

RISECHENNAI



Schematic diagram of Neithal Muttukadu ©RISEChennai

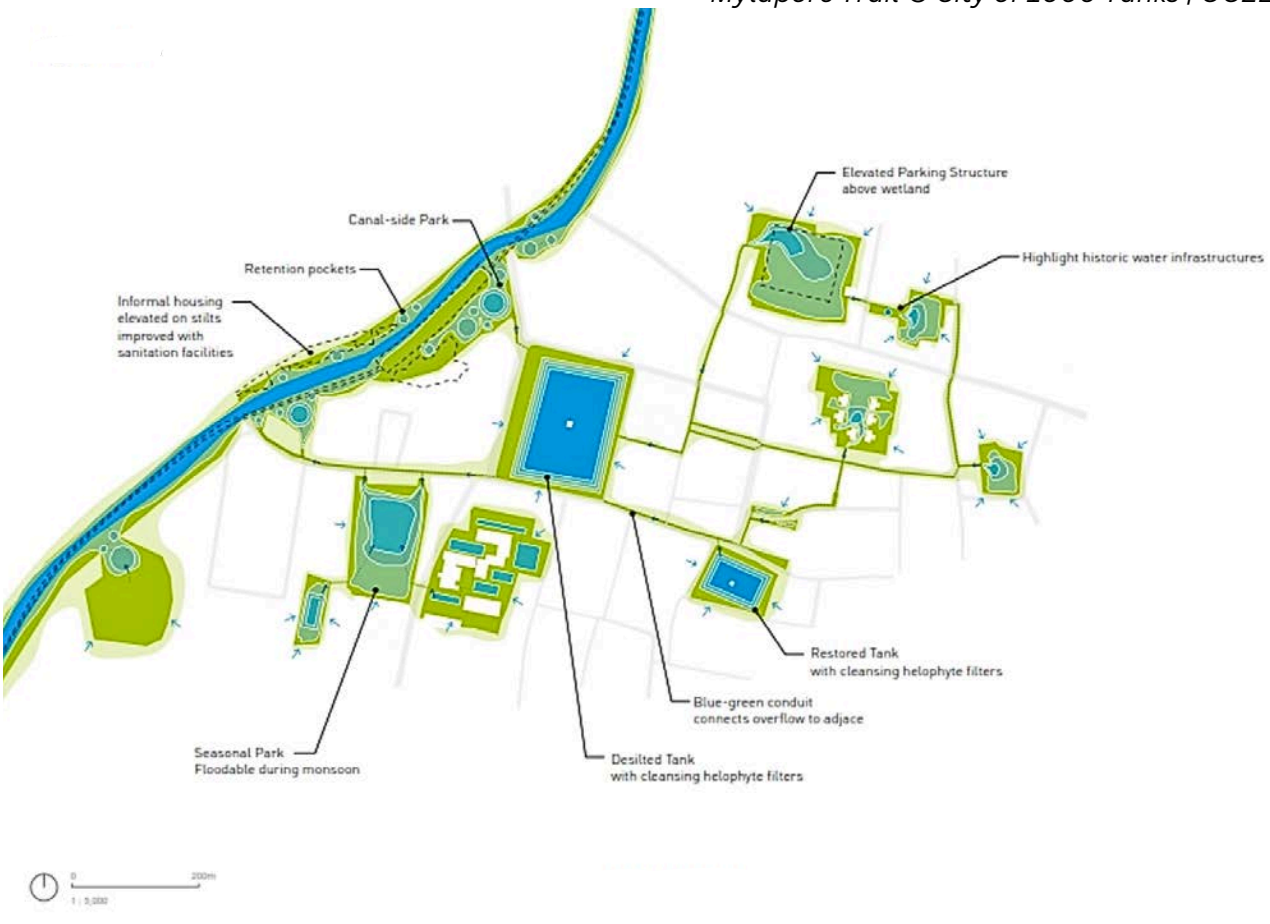
Mylapore Heritage Project

The Mylapore Heritage Project builds on the Little Flower Convent pilot project with the aim of creating a community-based water balance model at the neighbourhood / city scale which considers various livelihoods, vulnerable communities and public and private sector interests. Building upon the rich heritage of water management exhibited in the temple tanks of Mylapore, this project aims to shift the paradigm towards local low-energy and inexpensive ecosystem-based water storage and treatment systems. Specifically the project would include components such as :

- Restoring Kapaleeshwarar and Chitra Kulam temple tanks to improve the water catchment and recharge using nature-based solutions;
- Introducing constructed wetlands in the project site for grey water treatment;
- Creating detention areas and open spaces in the project site using bioswales which will collect, treat and recharge surface run-off;
- Conducting several interactions with local stakeholders at various stages of the project to ensure their support through implementation and for long term success.

Current Status : ***Application back from NABARD with comments.***

Mylapore Trail © City of 1000 Tanks | OOZE



Mylapore Heritage Project

Madras Terrace team explaining the project's vision to locals

Read the Mylapore Heritage Project's Executive Summary here : https://tinyurl.com/MylaporeHeritage

Water Matters : Collaborating on Water Projects in Chennai

On 10th Jan 2025, Chennai Resilience Centre, Okapi Research and Advisory Pvt Ltd and the U.S. Consulate General Chennai organized a meeting to bring together experts from countries and international financial institutions working on water infrastructure projects in the city and the larger metropolitan area. The meeting was conceived recognizing the increasing investment in water from several international organisations and the need to create a platform where representatives from these organisations can share their resources, relationships, expertise and experiences from their projects to address Chennai's water challenges more effectively, through increased coordination.

Participants included officials and experts from four countries – The United States, Japan, Germany and the Netherlands and two Multi-Lateral Development Banks – The Asian Development Bank and the World Bank. They highlighted initiatives in flood control, disaster management, flood mapping, public engagement, capacity building, wastewater treatment, and blue-green infrastructure. Key discussion points focused on bridging data gaps, enhancing data accessibility, unifying efforts on shared platforms, and leveraging local government expertise to strengthen Tamil Nadu's water resilience. The meeting ended with participants agreeing that there is a need to establish regular collaboration platforms for organizations to share updates and align efforts.

JAN

*The CRO presenting highlights on recent water related developments in Chennai, at the **Water Matters** meeting*

Ambassador Wong of ADB addressing the gathering

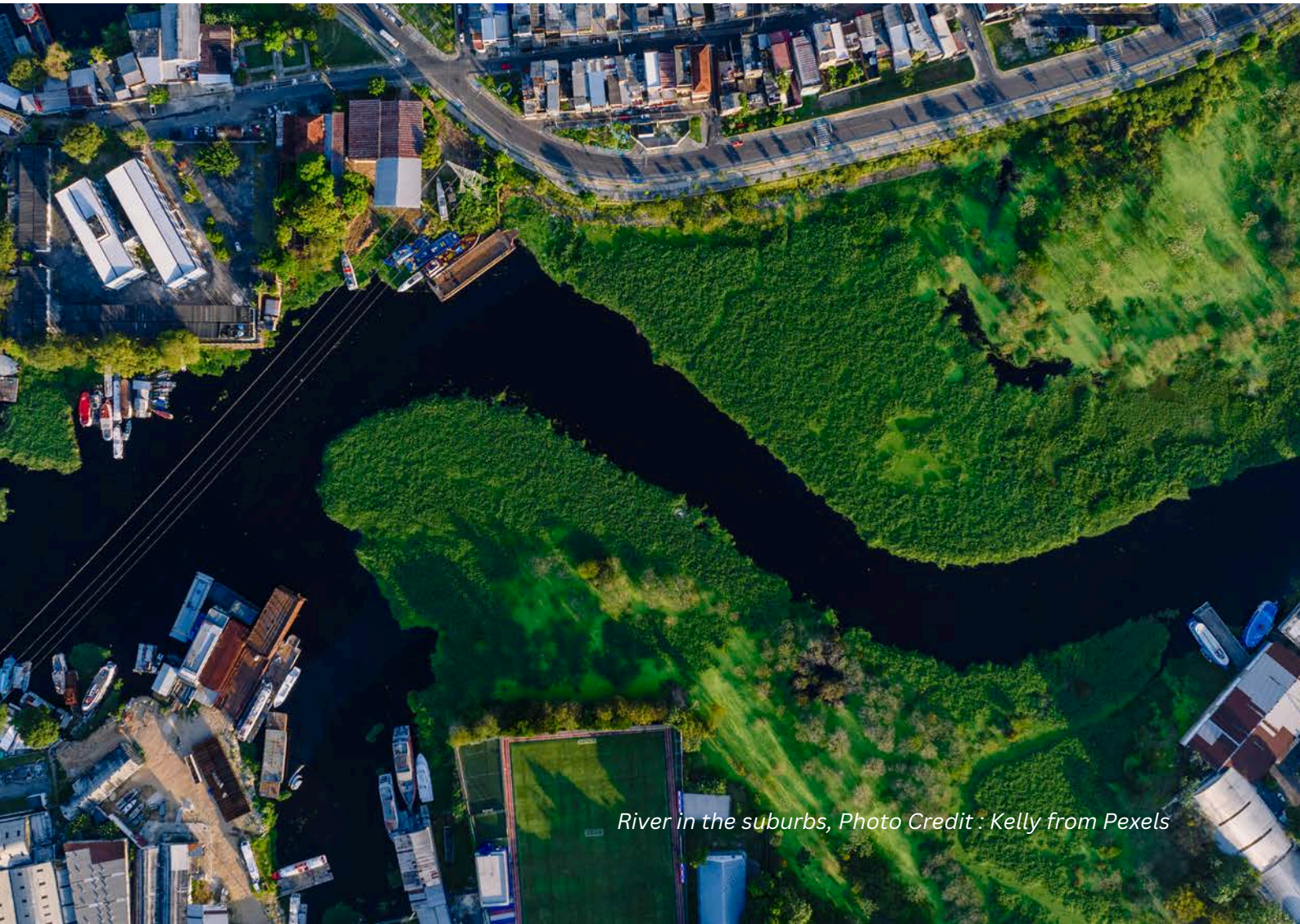
Water Matters : Collaborating on Water Projects in Chennai

Water as Leverage
For Resilient Cities

WaL - Way Forward

To develop an international standard DPR for the Neithal Muttukadu project.

To continue to conduct capacity building workshops for government departments on integrating nature-based solutions in water and drainage projects in the city.



River in the suburbs, Photo Credit : Kelly from Pexels

Media Coverage

Person reading newspaper, Photo Credit : Karolina Grabowska on Pexels

A terrace garden that helps cool frayed nerves

Padmaja.J@timesgroup.com

A Prathap

NOVELTY: The 1,000 sqft terrace garden of Anbagam in Otteri has helped cool the interiors by 7°C

Chennai: Mary B*, who suffered from schizophrenia and often faced hallucinations and disorganised speech and was abandoned by her brother and mother, wandered the streets of Tondiarpet in 2018. Now, the 51-year-old has come a long way.

Mary and her three friends, maintaining a roof garden of 150 veggies and flowering plants on the 1,000 sqft terrace of Anbagam, a govt-aided shelter for homeless mentally ill women in Otteri, have cooled the interiors by almost 7°C.

Her friends Rukmini S*, Fathima* and Jamila*, all between the ages of 40 and 47, have similar histories. Fathima, a resident of Anna Nagar, suffered from obsessive control disorder. Abandoned by her husband, she was brought to Anbagam by her sister and brother-in-law. Rukmini, a bipolar patient, would visit her family once or twice a year. In 2017, her brother signed her up for the shelter.

When they came to the shelter, all these women suffered with severe symptoms of the conditions they had. "They used to talk a lot, often without any sense. Their stress levels used to be high. Now, they have calmed down. They take medication in the mornings and evenings. Gardening has helped them. They also decide where their food comes from," says Vineetha, 32, Anbagam's coordinator.

The women share their routines. "We water the plants twice a day with water used to wash vegetables and pulses. Then we compost dried leaves in the pits downstairs. When I first saw the plants flower and bear fruit, I was on cloud nine," says Mary, as the rest of them tend to the plants in the roof garden. Her friend Rukmini is quick to add: "I look forward to when they will bear fruit so that we can pluck, cook and eat the vegetables and greens. Also, my friends in the shelter do not like to go outside in the sun because it is cool inside our dormitories because of the roof garden."

Even on days when the city sizzles at 40°C during peak summer, the 50-odd inmates of Anbagam feel only 33°C inside, as per the heat monitors installed by the Chennai Resilience Centre (CRC). The staff at the centre also helped them set up the garden with 100 plants of beans, tomatoes, brinjals, chillis, okra, radish, greens, herbs and flowering plants. The CRC also trained the women, apart from giving them grow bags, soil and cocopeat. "Since 2022, they have harvested around 200 kg of produce," says Srimathi B, CRC's community project director who monitors the Anbagam roof garden.

A psychiatrist who sees the women weekly says gardening is part of the rehabilitation process. "When other women in the shelter show more progress in treatment, they will be inducted into the activity too," she adds. (*names changed)

Several press publications and online blogs have featured CRC's projects including the Chennai Urban Farming Initiative, the Water Balance Pilot and the We Segregate zero - waste project, providing valuable visibility to the causes.

THE HINDU

Chennai

Organisations tie up to build green infrastructure for city

Chennai Resilience Centre will collaborate on its ongoing projects in Chennai, which align with the Tamil Nadu Green Climate Company's mission, to build resilience and provide region-specific designs for water and waste management

K. Lakshmi
CHENNAI

The nature-based water balance model adopted in Little Flower Convent Higher Secondary School for the Deaf in Chennai to treat wastewater will be replicated in two government schools. FILE PHOTO

The Chennai Resilience Centre, a voluntary organisation, has joined hands with the Tamil Nadu Green Climate Company to implement projects aimed at strengthening water and climate resilience in Chennai.

The organisation would collaborate on its various ongoing projects in the city, which align with the TNGCC's mission, to build resilience and provide region-specific designs for water and waste management. The CRC, which represents New York-based Global Resilient Cities Network in Chennai and a unit of Care Earth Trust, has recently signed a Memorandum of Understanding with the TNGCC to provide technical assistance and share knowledge on issues like urban heat mitigation and provide nature-based solutions for water treatment.

The collaborative efforts aim to expand CRC's ongoing programmes like edible rooftop gardens to reduce urban heat; nature-based solution to treat wastewater and Urban Ocean project to prevent plastic from reaching waterways, to other parts of the city and replicate it across the State.

"The MoU is a significant step in getting government support to scale up our flagship projects in the city and build green infrastructure along with the government," said Krishna Mohan, Chief Resilience Officer - Chennai Resilience Centre.

Besides some residential areas in south Chennai, the organisation has set up vegetable gardens in nearly 166 ICDS in Chennai. The gardens not only add to children's nutritious meals but are also used to teach colours and numbers to them. Rooftop vegetable gardens have been set up in six government schools and 10 more government schools would be identified along with the TNGCC. "In our pilot study, we observed that the mercury level had dropped significantly up to seven degree Celsius in rooms below the rooftop gardens during peak summer," said Mr. Krishna Mohan.

The nature-based water balance model adopted in Little Flower Convent to treat 27,000 litres of wastewater would be replicated in two government schools along with TNGCC. This project would reduce water stress and recharge groundwater.

Among the other projects is the attempt to transform localities like Kasturba Nagar into zero-waste area by increasing source segregation and setting up lane composters that could be diverted to vegetable gardens.

Water balance pilot project to treat wastewater and recharge groundwater inaugurated at Little Flower Convent

The idea is to improve groundwater table and arrive at a holistic solution to various issues affecting Chennai through nature-based and integrated solutions. The initiative will be upscaled to pioneer locations in coordination with Greater Chennai Corporation, says Eva Pfannes of Ooze Architects and team lead, City of 1000 tanks

Published - August 30, 2023 09:26 pm IST - CHENNAI

THE HINDU BUREAU

READ LATER PRINT

ROKA collects 7.6 tonnes of recyclable waste

Residents of Kasturba Nagar Association (ROKA) conducted its ninth waste collection drive on July 13 and 14 at KNRA Hall in Kasturba Nagar, Adyar. With a footfall of over 400, the drive racked up a collection of over 7.6 tonnes of recyclable waste, says a press release. E-waste, books, toys, divine pictures, unbroken glassware, pillows and mattresses, clothes, bags and footwear were collected at the event, organised by Urban Ocean in partnership with ROKA and recyclers, Wasted 360 Solutions and Recycle Mart.

Among the highlights of the collection drive were sustainable counters, which included a showcase of bio-enzymes by Miracle Enzyme. In its counter, Nilayaan presented a raft of composting options for visitors to choose from. Vaishnavi Venkatesh, a resident of Kamaraj Avenue set up a counter to start a 'Swap not Shop' group, where interested people can post about their requirement (especially for trendy clothes) or items that they want to give out, the release says. The Environmentalist Federation of India (EFI) also stationed the 'Lakes on Wheels' to raise awareness about water pollution and the necessity to save our water reserves, the release says. The highlight of the event was the street play put up by FEETS and a skit about solid waste management by the children of Kasturba Nagar. Other associations including RMSM in Thiruvanmiyur, SWM enthusiasts at Velachery and many apartment communities put in their sincere efforts to collect the materials and send it to Adyar centre, the press release adds. Contact ROKA at 86674 99835; roka.drives@gmail.com, to know more about the drive and get further notification about such drives happening in the city.

Lane composting project launched in Kasturba Nagar

Inspired by a community-based lane composting model established by residents of HSR Layout in Bengaluru, Residents of Kasturba Nagar Association (ROKA) set the ball rolling towards replicating it in their terrain back in Chennai. This effort has led ROKA to be associated with a larger project helmed by Okapi Research and Advisory and Chennai Resilience Centre (CRC).

"We Segregate", as the project is called, was launched on October 11, 2023 in Kasturba Nagar with three lane composters being placed on three streets. N. Mahesan, chief engineer, Solid Waste Management, Greater Chennai Corporation inaugurated the initiative. The gathering on the occasion included Subashini Durai, councillor of Ward 173 and officials from GCC and Urbaser Sumeet.

"The funding for the six-month project comes from The Resilience Cities Network and The Circulate Initiative," says Janani Venkitesh of ROKA.

A communication shared by Krishna Mohan Ramachandran of CRC with *The Hindu Downtown* identifies We Segregate as a component of the Urban Ocean program, "a world-wide initiative to end plastic pollution".

On the "We Segregate" project, the communication from CRC says: "The goal of the project is to promote source segregation among residents using lane composters and punch-the-plastic (PtP) hooks. Three lane composters are being introduced in Kasturba Nagar and several apartments will be given (PtP) hooks to segregate and store their multi-layer plastic (MLP) waste. The compost from the lane composters will be distributed among residents and feed into an urban farming program implemented by the Chennai Resilience Centre."

The communication adds that "the collected MLP will be sent for recycling through waste aggregators."

Making Kasturba Nagar a zero-waste neighbourhood and an example for replication in other neighbourhoods as the project's long-term goal. Photos: Prince Frederick

Here's how Kasturba Nagar keeps itself clean

1,200 Residents Turn Wet Waste Into Compost

Padmaja.J@timesgroup.com

Chennai: Greater Chennai Corporation asks people to hand over wet and dry waste separately for conservancy workers to easily take them to the corporation's composting centres and material recovery sites. But 1,200 residents of Kasturba Nagar in Adyar have not been handing over their wet waste since Oct 2023. Instead, they convert waste into compost.

They set up three 750-litre composting bins on the 2nd and 3rd Main Roads in Kasturba Nagar in Oct 2023. Around 30kg of wet waste, including meat waste, reaches the compost bins every day. They spread the waste in the bin and top it with dried leaves collected from the roads and houses, and keep it closed. By January, it yielded 225kg of compost. Helping the residents with the 'lane-composting model' was IIT M Okaapi Research Group.

"We got inspired by Bengaluru's HSR Layout's community composting," said Janani Venkitesh, secretary, Residents of Kasturba Nagar Association (ROKA). Vidya, GCC's Swachh Bharat Mission animator of ward 175, said, "Before the initiative, we got 130kg of wet waste daily. Now, we get 30kg less waste." Janani said they started lane-composting to make people segregate waste better. "Many in the city do not segregate waste, citing that even if they segregate, the waste gets mixed in the bins or trucks or the dumpyard. So, when people see organic waste getting composted, they are encouraged to segregate," she said.

The project is getting noticed. In Oct 2023, they got $10,000 from The Circulate Initiative (an NGO promoting circular economy) and Resilient Cities Network to kickstart the project. Every month, ₹10,000 is spent to run composting — ₹4,000 for cocopeat, which is mixed with wet waste before composting; ₹5,000 for labour and ₹1,000 for incidental expenses. Then, GCC and Urbaser-Sumeet inaugurated the project.

It wasn't easy in the beginning. "We had to get the system running like clockwork. Some residents said it would stink and attract mosquitoes. But we ensured that dried leaves and cocopeat were mixed with wet waste to remove moisture and foul smell," said Saranya, a Kasturba Nagar resident. The residents segregate plastic waste and keep them at common spaces in the apartment complexes. Once a month a dry waste recycler picks up the plastic waste for recycling.

Geo Damin, solid waste management researcher with Poovulagin Nanbargal, said: "Other areas too should do community composting. By pooling in a little money, anyone can convert wet waste into compost."

HOW TO COMPOST AT HOME

- Take a closed container that has an outlet or tap (like a water dispenser)
- Add cocopeat and dried leaves/ newspaper as the first layer in the container. **Crush dried leaves/ newspaper before use**
- Add wet waste generated at home after grinding it slightly, for faster composting. **Above the wet waste layer, add leaves or paper**
- Every day open the outlet or tap for moisture or leachate to exit. **This can be diluted and added as pesticide**
- In 30-50 days (during summer), compost will be ready to be dried and used. **During monsoon, it can take 90 days**

EXEMPLARY: Residents compost on street at Kasturba Nagar; plastic waste segregated for recycling

Composter installed by Adyar residents processes 800 kg of wet waste per month

TINISHA RACHEL SAMUEL

CHENNAI: Residents of Adyar have installed a three-lane composter with a capacity of 750-800 kg/month for solid waste management. Wet waste will be composed in the equipment, which has a capacity of making 20-25 kg of compost each day.

The wet waste will be deposited in the composter for a month, and manure will be distributed to the residents to encourage segregation at home.

In 2018, Janani Venkatesh, secretary, Kasturba Nagar Association (ROKA), started segregating and composting wet waste in her home, but it was not sufficient. So, she reached out to other residents on the Third Main Road.

Along with others who also faced the same issue, Janani formed ROKA for solid waste management.

Three-lane composter developed by Adyar residents

ROKA has been doing door-to-door campaigning and events based on solid waste management, and activities for children since its inception.

The lane composters were inspired by a community-based model constructed by the residents of HSR Layout, Bengaluru. The waste collected there was composed over there itself, with the help of Okapi Research and Advisory, which is a research company from IIT Madras, and the Chennai Resilience Centre.

The project was launched in Kasturba Nagar on October 11 by the chief engineer for solid waste management, N Mahesan, along with the ward councillor, Subashini Durai. The project is part of the 'We segregate' project, which is funded by the Resilience Cities Network and the Circulate Initiative. The funds were allotted for three-lane composters.

The project aims at segregating waste up to 90% in Kasturba Nagar and also inspire other communities to take it up.

Every day in Zone 13, the waste management contractor collects waste from each house in a battery-operated vehicle. The waste is being collected in three bins according to its classification – organic, dry, and hazardous sanitary waste.

"Students of IIT-M developed an equipment to collect separated multi-layer plastics. A first-of-its-kind in the city, it hasn't been launched yet. But along with students, we're introduced it in the area. Only multi-layer plastics like chocolate wrappers, chip packets, etc., are collected, which will be sent for pyrolysis to the cement factories, where it could be used as fuel," explains Janani.

Watch a documentary by Deutsche Welle featuring the We Segregate project here : https://tinyurl.com/WeSegregateDWd

Key Engagements and Awards

Key Engagements

CRC has been interacting with multiple government, private, civic and academic stakeholders via varied forums with the intention of a) seeking financial and non-financial support; b) sharing knowledge and disseminating learnings; and c) developing potential collaborative links. One important collaboration is with the Resilient Cities Catalyst.

Collaboration with Resilient Cities Catalyst (RCC)

CRC and Okapi Research and Advisory have recently collaborated with the Resilient Cities Catalyst for the ***Neighbourhood Small Business Climate Resilience Program (NSBCRP).***

Resilient Cities Catalyst is a non-profit that was founded in 2019 by members of the 100 Resilient Cities (100RC) leadership team. The NSBCRP will bring together local government, resident leaders, and micro and small enterprises to plan and implement projects that address short and long-term climate risks in commercial areas of neighbourhoods.

This program will also build the capacity of local leaders, accelerates project implementation, and strengthens communities' resilience to the impacts of climate change. Chennai joins a network of seven other cities working on similar projects with RCC.

Other engagements have involved face to face or virtual meetings between CRC team members and organizations like GCC, CMDA, WIPRO, NIKE and so on. In addition, the CRC team has made formal presentations and submitted grant proposals including :

- IGCS students visit : Students from Germany and India, who are part of the Winter School Programme at the Indo - German Center for Sustainability, Indian Institute of Technology, Madras visited a CUFI model garden in Valmiki Nagar and an ICDS centre. The students observed how these gardens were integrated into daily learning for children in the ICDS centre, becoming effective tools for nature-based education. Prior to the visit, the CRC team conducted a workshop on Integrated Spatial Planning for Resilience in the Chennai Metropolitan Region for the students of the IGCS Winter School 2023-2024.

Key Engagements

- University of Copenhagen Students' Visit : A group of students from the Masters of Disaster Management Programme at the University of Copenhagen visited Chennai in February and met with the CRO to understand the Chennai Resilience Centre's work. The CRC team discussed its flagship projects including CUFI's contribution as a heat mitigation strategy with food and economic opportunity at the center of the project design.

Students from the University of Copenhagen

- The 2nd CityFood Peer-to-Peer Exchange on Healthy Food Markets, 17th July 2024 : Members of the team presented the CUFI programme in this online workshop organized by ICLEI and GiZ. The workshop brought together speakers from across the world to share their experiences on urban food markets.

- Master Planning and Climate Action Plan Consultations : CRC participated in several stakeholder engagement workshops conducted by CMDA and GCC on the 2nd Master Plan and implementing the Chennai Climate Action Plan respectively.

- CRC organised at a meeting for NIKE where the hosts brought together a few key organisations to present project pitches for CSR funding. CUFI, We Segregate and the Water Balance Pilot were presented as possible projects that could be supported. NIKE reached out to CRC in 2025 stating their interest in supporting two projects : expanding the LFC water balance pilot project and supporting an initiative of the Madras Boat Club which takes rowing to low income communities.

Key Engagements

- CRC was invited to the ***International Seminar on Sustainable Urban Agricultural Systems and Community Resilient Cities***, organized by the College of Agriculture, Vellayani, Kerala. CUFI was recognized as a significant project that showcases the real potential of urban agriculture as a nature-based solution to address climate related challenges.

Dr. Parama Roy, shown here at the College of Agriculture, Kerala

- IGCS Summer School : Members of the Urban Ocean team were invited to present a lecture at the IGCS Summer School in RWTH Aachen, Germany in July - August 2025. The theme of the program was 'regenerative urban futures – circular economies and societies' and the CRC team's lecture was titled 'Building Circularity in Chennai's Waste Management System – A Collaborative Task for Public, Private, and Civic Actors.

- CRC participated in a workshop in October titled ***'Rising Heat : Convening for Building Heat Resilience'*** co-organised by the Ashoka Trust for Ecology and Environment (ATREE), WIPRO Foundation, and Azim Premji University in Bengaluru. The two-day workshop provided a platform for in-depth discussions, collaborative deliberations, and the development of shared strategies to address the growing heat risks that affect communities.

- WIPRO requested for CRC's support in facilitating a workshop along with Care Earth Trust to brainstorm call for proposals for their Small Grants Programme. This brainstorming session allowed for the team to present the CUFI programme which WIPRO were very impressed with.

Key Engagements

- ARiSE workshop : CRC, Okapi and IGCS co-hosted a workshop in November 2024, titled 'ARiSE (Agroecology for Resilience, Sustainability and Entrepreneurship)'. The workshop brought together practitioners and experts in Sustainable Urban and Peri-urban farming from in and around Chennai, to share their experiences in farming and to identify policy gaps in fostering urban and peri-urban agriculture.

Attendees engaged in a focus group discussion at the ARiSE workshop

Read the inaugural edition of the ARiSE newsletter here : https://arise.website/?page_id=1306

- CRC was invited to speak about CUFI at a ***workshop organised by The Group on Earth Observations (GEO) in partnership with the World Meteorological Organization (WMO)*** in Geneva from the 27th of Feb to the 1st of March 2024. There was good response to the project.

- A research grant proposal was submitted through Okapi to the ***Global Disaster Preparedness Centre (GDPC)'s Small Research Grants Program*** to assess if and how rooftop vegetable gardens can be an effective community driven and nature-based adaptation strategy for coping with heat. The application has been successful and the project will commence soon.

Key Engagements

- A research grant proposal was submitted through Okapi to the ***Tamil Nadu Land Use Research Board (TNSLURB***) to examine whether and how commercial organic urban / peri-urban agricultural practices may be leveraged as a pathway for sustainable development.

- A grant proposal was submitted to ***Novo Nordisk*** an international platform that brings together several funders to fund specific challenges. CRC submitted a proposal to the Healthy Cities Challenge. Unfortunately the attempt was unsuccessful.

Awards

Vocational Excellence Award – Environment : Honoring the work of the CRO, The Rotary Club of Chennai Towers presented him with the Vocational Excellence Award – Environment. The award was presented in recognition of excellence, result-oriented performance and commendable achievement.

Chennai Resilience Centre
www.resilientchennai.com

CHENNAI RESILIENCE CENTRE

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OKAPI