Chennai Urban Horticulture and Rooftop Gardening Initiative

26 July 2018

RESILIENT CHENNAI

Project Snapshot

The Resilience Challenge

To cultivate ownership and meaningful engagement in Chennai citizens with civic issues like garbage segregation and water conservation.

The Intervention

Use rooftop gardening to create awareness of the values and benefits of waste segregation at source (composting, recycling), and water conservation (drip irrigation, rain water harvesting).

The Scale

Initially within two localities with strong Resident Welfare Associations & 15 Corporation Schools (one per city zone). Eventually, the entire area covered by the Greater Chennai Corporation.

RESILIENCE CHALLENGE

CIVIC ENGAGEMENT

How do we get the citizens of Chennai to care about and engage with civic issues such as **solid waste management?**

THE BACKGROUND

- Dumping in waterbodies
- Clogging storm water drains
- Littering
- Minimal segregation at source

THE PROBLEM

Segregation at source can reduce waste by 70%.

How do we encourage citizens to **share responsibility** with the government to achieve a Zero Waste city?

What buttons do we push to move a Chennai citizen from
Passive Resilience to Active Resilience?

Awareness? Pride? Identity? Safety? Loyalty?
Religion? Love? Proof? Better infrastructure?
Belief?
Carrot? Stick?
(How big?)


“No large scale, meaningful change can happen in Chennai without the active support of our citizens.”
- Social Activist
Namma Chennai,
Lift a finger, before you point a finger!

THE INTERVENTION

Chennai Urban Horticulture and Rooftop Gardening Initiative

- Utilize 1000s of acres of rooftops to scale-up vegetable gardening through a citywide strategy involving stakeholders such as residential welfare associations.
- To encourage students of 200 corporation schools to take up vegetable gardening and rooftop farming in order to promote a value-based education and supplement the Govt of Tamil Nadu's Nutritious Meal Program.
- Conduct training and awareness programs in Chennai's parks to educate citizens.

Benefits of Urban Horticulture

- **Food and nutrition security:** Growing fruit and vegetables in and around cities increases the supply of fresh, nutritious produce and improves the urban poor's economic access to food.

  In **El Alto, Bolivia** (70% poverty) 500 families were trained to grow a wide variety of vegetables, herbs, medicinal plants and fruits in small, low-cost greenhouses. The result was a general **improvement in child nutrition** (one in five were malnourished) and family **savings of US$30**, which was spent on eggs and meat.

- **Sustainable livelihoods:** UPH provides livelihoods that are resilient to economic downturns and food price hikes, and contribute to cities' economic development.

  In **Dakar, Senegal** micro-gardens are popular with women. **35%** of produce is kept for home use, while the rest is sold. Typical income from a family micro-garden of 10 sq.m. ranges from **US$15-30 a month**.

- **Safe, clean environment:** Linking waste management to horticulture helps to keep the urban environment clean, reduce health hazards and boost production of fresh food. It also lowers temperature and reduces the need to transport produce, thereby saving fuel and lowering CO2 emissions.

  In **Cairo, Egypt**, rooftops planted with vegetables are **7C cooler** than next door.

UPH = Urban & peri-urban horticulture (FAO)

Benefits of Urban Horticulture

- **Good governance:** Building a sustainable UPH sector provides a lab for innovative approaches to urban development, and examples of good governance in action.

Kigali, Rwanda has sought FAO advice on measures aimed at **integrating UPH** into the **city's master development plan**. **Nairobi** and **Accra** have created **municipal agricultural departments**.

- **Healthy communities:** Orchards and vegetable gardens provide excluded groups with food, income, a focus for shared enterprise and a constructive channel for young people's energy.

In one **Nairobi, Kenya** slum, young men with a past as petty thieves now earn a decent living growing and selling vegetables for their community. Income helps pay for them to attend school.

In **Bogota, Colombia**, a community programme extends the benefits of vegetable gardening to former combatants, the elderly, female prison inmates, the disabled and people affected by HIV/AIDS.

Source: FAO, 2010, and FAO Factsheet

Kerala

- In 2011, **35,000 families** were part of a novel project launched by the State Horticulture Mission-Kerala (SHM-K) under the **Vegetable Initiative for Urban Clusters (VIUC**), a project launched by the Union Ministry of Agriculture and funded by the Rashtriya Krishi Vikas Yojana.

- Beneficiaries were selected through **residents' associations**. Each household was provided **with 25 grow bags and potting mixture**. More than **15 lakh high-yielding seedlings** of tomato, chilli, amaranthus, cluster beans, brinjal, cabbage and cauliflower were supplied to the families. **Organic manure** and **biocontrol agents** for pest management were provided along with a **handbook in Malayalam** and **training programmes** by the Agriculture Department.

- Most families **generate 500g to one kg of each vegetable every two days**, enough to meet the domestic requirement. Excess produce is given away free or sold to the neighbourhood.
- **2,000 farmers' groups** in the suburbs are part of the VIUC. The Kerala State Horticultural Products Development Corporation has a **buy-back arrangement** with these clusters. About **3,000 kg of vegetables** are procured daily from the farmers and sold through **Horticorp's retail outlets**.

- A few private apartment buildings have gone one step further by **integrating rooftop cultivation** of vegetables with **kitchen waste conversion to organic manure**.

Source: The Hindu – Eden on the roof, full of greens

"The primary objective of the project is to enhance the production of pesticide-free vegetables through organic methods. Terrace gardens are the natural choice in an urban environment where space is at a premium."

-- K. Prathapan, Director, SHM-K

Survey

To gauge interest amongst Chennai residents in an urban horticulture initiative, an online survey consisting of 18 questions, targeted towards the lower/middle income groups, was conducted.

Sample size: 304

Survey Insights

72%

Residents who identify as needing training on terrace gardening

83%

Residents who would like to maintain a terrace garden

61%

Residents who currently garden at least once a week

Sample size: 304

Survey Insights

5 out of 6

Residents would prefer to spend time growing produce instead of shopping for vegetables at the local market

Sample size: 304

QUESTIONS

Resident Welfare Associations

- How do we work with RWAs to advance urban horticulture?
- Do we need permission from every flat or household to develop rooftop gardens?
- How much will citizens / building associations be willing to invest? What should a 'kit' cost be?
- What subsidies can be offered to incentivize adoption?
- Who should manage the effort?
- Would RWAs be open to contract farming?
- How should the produce be divided between the residents?
- If the produce is being sold, how should the pricing be fixed?
- How should the money be distributed?

Other

- How do we bring about behavioral change using rooftop gardening as a tool?
- How do we use rooftop gardening to encourage people to segregate waste and compost?
- How do we encourage the setting up of rainwater harvesting / solar panels?
- Should the produce be sold to farmers markets locally or should we tie up with retail vegetable shops?
- How do we protect the livelihood of the door to door vegetable vendor? Can the vendor be integrated into the contract farming process?

Technical issues

- Are there any building guidelines or regulations that we need to adhere to? Do we need any clearances?
- How much area is required to grow a rooftop garden to meet one family's domestic requirements?
- How do we address water needs for rooftop gardening?
- How can we solve the issue of water permeability from rooftop gardens?
- What are the other infrastructure challenges?
- What would be the right crops to grow in Chennai?
- What is the best way to account for seasonality?
- What kind of approach would suit rooftop gardening – organic or chemical?
- Would focusing on 2-3 crops be better, along with plants that complement these crops?
- Should the focus be strictly on native species or can plants that are gaining market attention such as basil be produced?
- Is a kit-based approach suitable or should we localise the solution based on factors such as water availability?
- How can vertical farming be integrated?
- How should the rooftop garden be maintained in terms of nutrition and pest control?

Key Project Challenges

- **Civic consciousness** levels are relatively low for Chennai; The challenge is to **drive a behaviour change**.
- **Infrastructure challenges:** Most roofs for housing apartments in Chennai are permeable, adding to the complexity of maintaining a roof garden. **Terrace surface water-proofing**, **drip irrigation systems** and **heat protection** will also have to be explored.
- **Water shortage/quality:** Chennai does not have a stable monsoon. **Dry spells from Jan - May** may lead to challenges in maintaining rooftop gardens. Incentivising homeowners to water the garden in dry spells can be a challenge. Water quality in certain localities is poor due to **salt water intrusion, ground water pollution**.
- **Residential Associations:** To get the buy-in of the residential associations is key. The challenge is to understand how these associations will respond to this idea, as well as their **willingness to install the necessary equipment.** Further, implementation may be affected by **opposition from some members in a locality.**
- **Support & Guidance:** Crop failure through **lack of expert guidance**, **poor quality of saplings / seedlings**, and **pest and disease attacks** can affect success.

Proposed Recommendations

Recommendation #1:

Focus on developing clusters of adoption

Start with two model localities.

Criteria for RWAs

To cultivate ownership and meaningful engagement in Chennai citizens with civic issues like garbage segregation and water conservation

Criteria for Corporation Schools

To cultivate ownership and meaningful engagement in Chennai citizens with civic issues like garbage segregation and water conservation

Recommendation #2:

Create a civic brand to engage community

A unique brand

Pachchai Chennai /Green Chennai Roof Tops – Creating holistic futures!

Successfully established terrace gardens could **paint the logo on the side of their building** (or **put a sign on their terrace visible to neighbors**), alerting their community to the residents' involvement in the program.

This creates a **physical brand** that individuals would see and photograph, creating a **memorable impression** on those who see it.

It also adds an element of **exclusivity** to the program, encouraging others to investigate if they would like to join the initiative.

Finally, future Resilience projects could be branded with the same logo to connect the overall resilience efforts in Chennai.

Comprehensive – Covers roof top veg gardens, Solar and RHW.

Recommendation #3:

Partner to increase awareness and accessibility of starter kits

ROOFTOP GARDEN KIT

What components should a successful terrace garden kit contain, considering costs, Chennai climate and rooftop conditions?

Drip Irrigation

IRRIGATION

Rainwater Harvesting

Seed Packets

CROPS

FERTILISER/ PEST CONTROL

Panchakavyam

Neem Oil

Grow Rolls

CONTAINERS

Grow Bags

GROWING MEDIUM

Smart Bins

Potting Soil

ROOF PREP

Water Proofing Paint

Shade Nets

Partners

- Involve NGOs and Local Nurseries in the project.
- Tie up with Amazon/Flipkart to deliver elements of the TVG to the households: Drip irrigation systems, Seed packets, Grow Rolls, Grow Baskets.
- The State Horticulture Department to provide guidance and support. Subsidies where required.
- The State Department for the Empowerment of Women to provide trained staff where required. Also Organic fertilisers and pesticides.
- TANGEDCO for Solar roofs.
- Rain Centre for RHW guidance.

Recommendation #4:

Leverage civic life on active terrace rooftops to increase social cohesion

Activities

- Demos in locality parks
- Nurseries in the Parks to provide seedlings.
- Composting in the Park.
- Farmers’ market.

Greater Chennai Corporation Education Department

Printed from
THE TIMES OF INDIA

Chennai: 100 corporation schools to grow vegetables for noon-meal

TNN | Jul 3, 2018, 08.14 AM IST

CHENNAI: Nearly 100 city corporation schools will soon be equipped with gardens that grow vegetables for their mid-day meal scheme.

A self-help group which acquired expertise in terrace gardening under the National Urban Livelihood Mission will train the corporation teachers and students.

"Members of the SHG will train nearly 40 students who are part of eco clubs and the national green corps. These children will be provided with seeds and pots for 25 plants. They will grow the plants either in pots in terraces of the schools or in a small patch of land available inside the school premises," said deputy commissioner, education, Mageswari Ravikumar.

Commitment to schools

- Greater environmental awareness
- Respects tradition
- Health and nutrition
- Increases social responsibility
- An increase in overall interest in learning
- Children understand “Farm to Table” journey of food
- Segregation of waste in schools

Greater Chennai Corporation Solid Waste Management Department

Schedule- V

Schedule of Fines

1. Non-segregation / littering / burying / burning of Solid Waste / domestic hazardous waste / Mixing Construction & Demolition waste with Solid Waste & domestic hazardous waste..

SlNo		Categories	Fine in Rupees applicable for each and every time of violation
1		Residential	1000
2		Non-Residential	2000
3		Event organizers	25000
4		All type of traders	1000
5		Street Vendors not keeping suitable garbage container	100
6		Dumping Garden Waste on public streets	1000
7		Defacement of public places inclusive of littering/ urinating/ Open Defecation/ spitting etc.	100
8		Non clearance of litter created by pet animals on street / public place	100

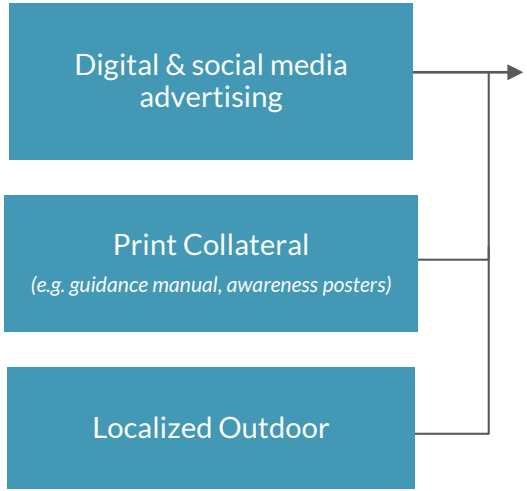
Draft solid waste management by-laws ensure composting practiced across the city.

- Households will be expected to segregate and store the waste generated by them in three separate streams: biodegradable, non biodegradable and domestic hazardous wastes in suitable bins.

- All resident welfare and market associations, gated communities and institutions with more than 5,000 sqm. area and hotels and restaurants will have to ensure source segregation of waste and provide for composting or bio-methanisation within the premises as much as possible.

Stricter enforcement expected.

Budget/Funding Resources and Commitments



Targeted at creating awareness and generating registrations for TVGs in Model localities.

Design & Media Costs	**Rs. 5.0 Lakhs** per month	*In bursts of 3 months*
Cost of adopting one Corporation school	**Rs. 1.3 Lakhs** initial investment	*Includes one trained staff and cost of organic fertilizer, pesticide etc. Maintenance cost to be borne by the school.*
	Rs. 30,000 recurring monthly	

	STAKEHOLDERS
OWNERS	• The Greater Chennai Corporation. • The State Horticultural Department. • Tamil Nadu Corporation for the Development of Women (TNCDW) • The Smart City Mission.
APPROVERS	• The Greater Chennai Corporation. • The State Horticultural Department. • The Slum Clearance Board. • The Chennai Metropolitan Development Authority (CMDA)
PARTNERS	• Chennai City Connect: CSR fund raising • M.S. Swaminathan Research Foundation: Advice on what vegetables to grow, organic fertilizers and pesticides. • Magic Bean, Indra Gardens, My Harvest: NGOs already practicing Terrace Gardening/UH. • Future Farms: Hydroponics • National Urban Livelihoods Mission: Access to trained women workers. • University of British Columbia: Research and fine tuning the UH final offering.
BENEFICIARIES	• The urban poor (especially women and children) • Citizens of Chennai in general • State Govt. Departments dealing with Water & Solid Waste

THE VISION

Growing Resilience Gardens: The 2030 Vision

We see a Chennai where every terrace has a vegetable garden.

Where concrete spaces blossom into green spaces cooling the city.

Where rain water harvesting results in mitigating the effects of water scarcity.

Where our citizens learn to be responsible for their city and start believing that they too can make a positive difference.

Where ‘reduce, reuse and recycle’ becomes a way of life.

Where we work together and join hands to create a better, more livable, RESILIENT Chennai!


1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
THE GLOBAL GOALS
For Sustainable Development
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE AND JUSTICE STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS