LOOPS AS LEVERAGE

Spatial Framework for Circular Neighbourhoods: Case of Koundampalayam, Coimbatore

rad OFFICE

Fig 1: Cover image: Scheme showing transcalarity of Circular Covai Vision
Fig 2: Concept view of a proposed people-friendly street in Koundampalayam

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Case of Koundampalayam, Coimbatore

Coimbatore has developed from a humble village along R.Noyyal to an energized industrial hub. While the pace of urban development in Covai has been exceptional in the last decade, improvements in social, ecological, and economic realms have not gone hand in hand. Furthermore, the Covid-19 global pandemic has emphasized the need to co-create resilient, adaptive, and liveable communities that are locally self-sufficient. Loops as Leverage puts 'urban circularity' at the forefront of urban development and presents a replicable and scalable spatial framework that leverages the loops of PEOPLE, WATER, FOOD, and ENERGY to drive a sustainable urban development. This report takes the reader through the design process and proposal to create India's first Circular Neighbourhood in Koundampalayam, Covai.

Fig 3: Concept view of proposed traffic-calmed street along Corporation park

Acknowledgement

rad OFFICE and the collaborators of 'Loops as Leverage' express our deepest appreciation to the Coimbatore City Municipal Corporation (CCMC) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH for providing us with the platform to conceive and develop the 'Circular Covai' vision. Our special gratitude to the Covai Urban Design Competition jury members for recognizing our work among the winning entries and offering insightful suggestions. We are also thankful to the local stakeholders, whose contribution through site-specific inputs, helped us comprehend the project.

We also thank the other partners—TARU Leading Edge, and Urbanista—for their consistent support throughout the project and valuable feedback across every stage. Our work relied on several precedent projects for reference and inspiration. We thank all authors who had done works on Circularity and made them available as open-source references. All citations have been duly added as part of this report.

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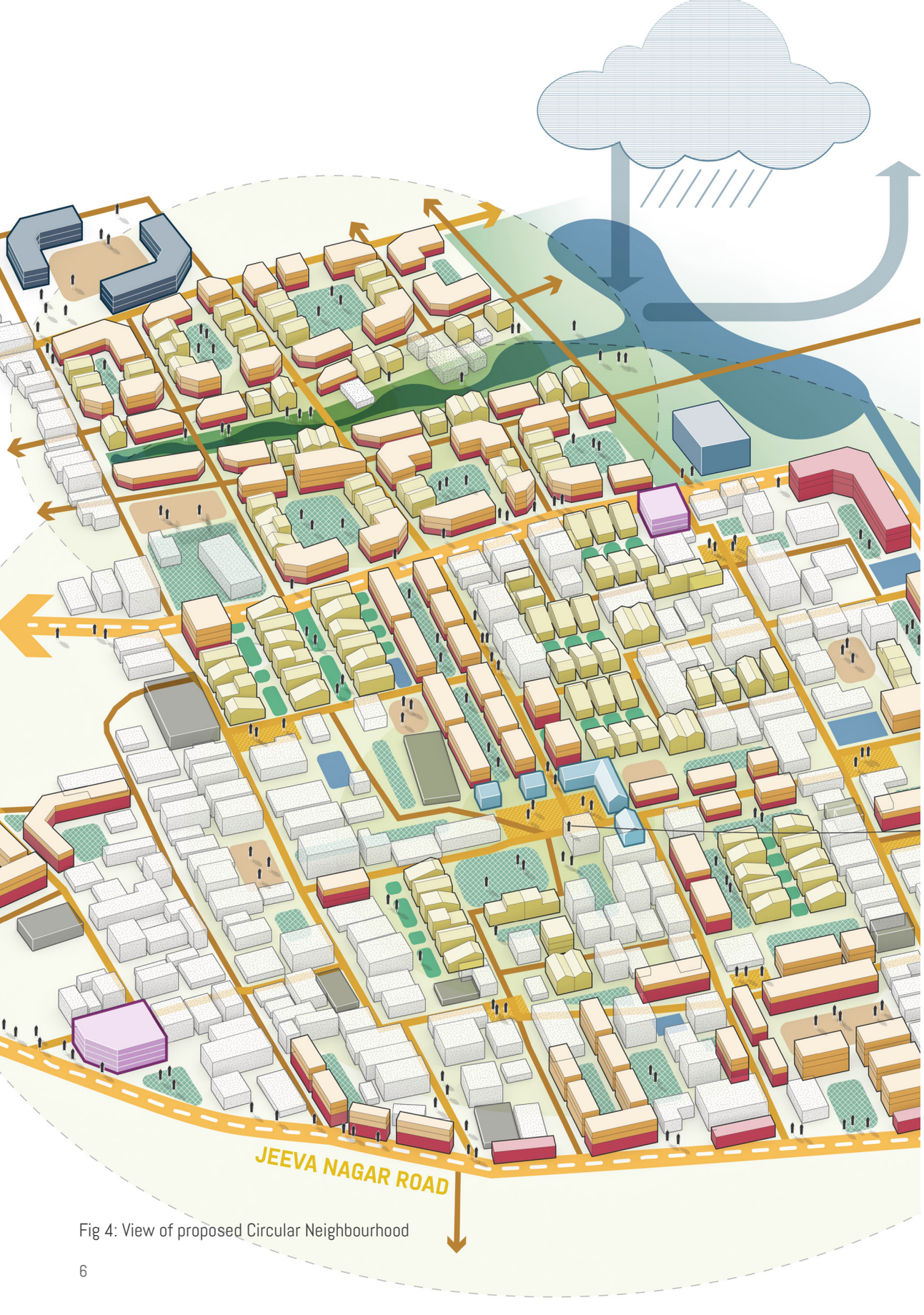


Fig 4: View of proposed Circular Neighbourhood

Team

rad OFFICE
Interdisciplinary design practice

rad OFFICE is an interdisciplinary design practice founded by T R Radhakrishnan, an architect and urban designer. rad OFFICE believes in collaboration and works with self-motivated professionals from various fields who collectively strive to make a positive impact in the world of architecture, urban design, planning, and landscape.

T R Radhakrishnan
Project Lead, Urban Design & Architecture

Radhakrishnan is an architect and urban designer based in Chennai. He has professional experience across multiple scales, community-driven approaches, public space planning, and urban systems thinking. Currently, he is pursuing a Master of Architecture in Urban Design at Harvard University with a 'Dean's Merit Scholarship'.

Bala Nagendran M
Co-lead, Landscape & Urban Strategy

Bala Nagendran is a landscape architect who graduated from SPA Delhi. He has worked across different sectors of urban development and has experience in research, planning, communications, and capacity development. As a passionate observer of cities and their landscapes, Bala strives to transform them for equity and responsiveness.

Preetika Balasubramanian
Collaborator, Urban & Spatial Strategy

Preetika Balasubramanian is an urban designer and architect, based in Rotterdam, Netherlands. She completed her Master's degree in Urbanism from TU Delft and has considerable experience in research and design of climate-adaptive cities, urban circularity and grassroots energy transitions in collaboration with local communities.

Ganesh Babu R P
Collaborator, Sustainability Strategy

Ganesh Babu is an urbanist and architect from Madurai. He has a masters in Urbanism from TU Delft and currently works from Rotterdam, the Netherlands. His area of expertise involves translating complex, systemic design strategies into bite-sized ideas to initiate action among diverse stakeholders.

Rohit Lahoti
Collaborator, Public Policy & Social Study

An alumnus of University College London and a recipient of Commonwealth Scholarship, Rohit Lahoti is an architect and urban development practitioner- presently practicing in Mumbai. His work & publications have ranged from designing to public policy analysis along with conducting in-depth research in the informal housing space.

Mona Vijaykumar
Collaborator, Urban Design

Mona Vijaykumar is a graduate candidate in the Master of Science in Architecture Studies and Urbanism program at the Massachusetts Institute of Technology. She envisions a society that collectively values diversity, ethnicity, and culture. She aims to tackle both social and environmental issues through design and collective thinking.

Yash Gogri
Collaborator, Architecture

Yash is an architect based in Chennai. He completed his Bachelor of Architecture from the School of Architecture and Planning, Anna University. He has worked on urban design projects in India which aim to improve accessibility. His interests lie in unravelling patterns that function cohesively in an urban setting to make cities livable.

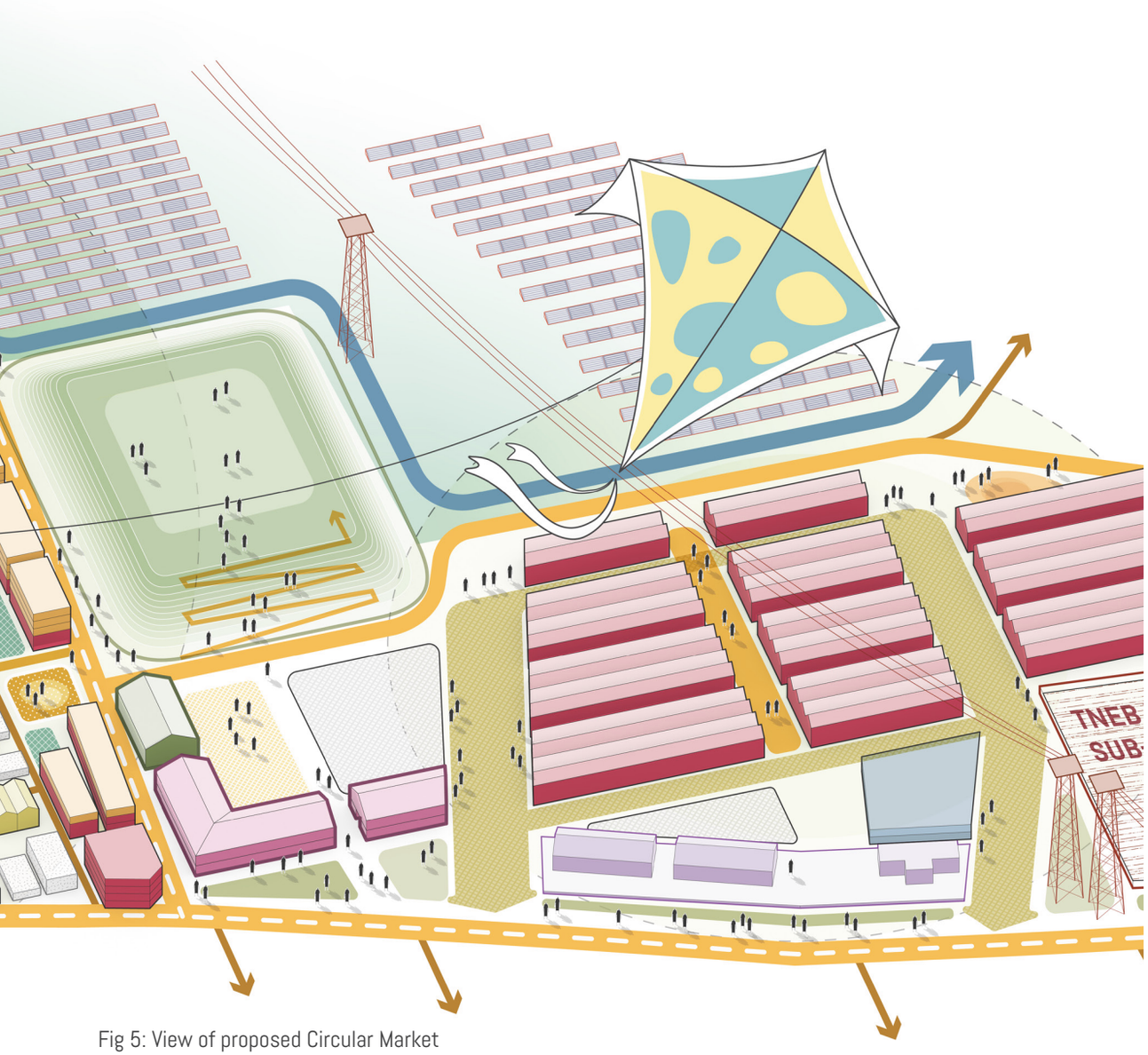


Fig 5: View of proposed Circular Market

Summary

The Co(Vai)-Design Competition was a national-level Urban Design Competition that aimed to jointly design and facilitate, with a diverse set of stakeholders, the implementation of integrated civic projects of key relevance to sustainable development in Coimbatore. The competition sought to foster integrated urban development of a site in Koundampalayam (Coimbatore), share its ecological heritage with the city and its immediate neighbourhoods, and improve the environmental, social, and cultural sustainability of the city neighbourhoods and its residents. The competition brief gave additional focus on making this a participatory process, which includes connecting various city stakeholders, understanding local context, opportunities, and challenges, and bridging technical, community-level, and institutional gaps across various sectors. In the competition phase, a framework plan for the entire ward, integrated design approaches for two key subsites were identified and developed.

Loops as Leverage, presents an integrated approach to realise the Circular Covai vision through a replicable and scalable urban circularity model that leverages the loops of PEOPLE, WATER, FOOD, and ENERGY to co-create a sustainable neighbourhood at Koundampalayam.

Our project aims to rethink how urban development happens in the city by placing **'Urban Circularity'** at the forefront. Urban Circularity as the core lifestyle and planning value can amplify synergies and accelerate the goals of regenerative ecology, inclusive society, and a productive economy. Furthermore, it is a step towards aligning with the United Nations sustainable development goals and Coimbatore SUD-SC vision.

The concept proposal by rad OFFICE and collaborators was judged the SECOND WINNING TEAM in the competition and were contracted to further develop our ideas along with the other winner. In the second phase of the competition process, our team prepared the Concept Master Plan for the Dr MGR Market & the surrounding public domain (Subsite C) and Detailed Project Report (DPR) for a pilot project.

In Section 1, the report elaborates on the concept of circularity, circular cities, and their relevance to Covai. Section 2 outlines the Circular Covai Vision, introduces the four resource flows considered for the project. Section 3 showcases the Toolbox for Circular Neighbourhoods and the proposed spatial framework for Koundampalayam. Section 4 elaborates in detail the design strategies for a Circular Market in Subsite C, and concludes with recommendations for further research.

Fig 6: Proposed Concept for various nodes within Koundampalayam

Contents

1

Introduction

Fig 7: Photo of Prabhu Nagar informal settement. Source: GIZ India.

i. Circular Covai

Covai has developed from a humble village along the Noyyal river to an energized industrial hub. The city has experienced growth in population due to rapid industrialisation and emerging educational institutions, both in the centre and the outskirts. It is surrounded by the Western Ghats mountain range to the West and the North, with reserve forests (Nilgiri Biosphere Reserve) on the northern side.

The Noyyal River runs through the city and forms the southern boundary of the corporation. Several lakes like Singanallur, Valankulam, etc, contribute to the ground water lifeline as well as preserving wetlands surrounding them. The CCMC, under Smart City Mission, have considered the cultural importance of these lakes and have initiated restoration along with recreational activities.

Key challenges faced by Coimbatore:

The city grew concentrically around the Town Hall and lakes, and expanded linearly along the arterials, inducing agglomeration and gentrification. The growth and development of the city have also placed a considerable strain on its resources such as water, food, energy, and people.

1. **Urban sprawl and climate change:** The rapid growth of the city towards ecologically sensitive zones like the western ghats and encroachments along water bodies causes a lot of stress to the green-blue systems of the city. The growing city needs an integrated vision that can prepare the city for issues related to climate change and urban sprawl. Urban governance, policies, schemes, and financing needs to be designed to incentivize the synergies between urban development and climate goals.

2. **Stress on utilities and services:** The growth of urban population has led to congestion in the city, which is imposing severe stress on civic amenities including water supply, sanitation, electricity, and transport.

3. **Lack of affordable housing:** Coimbatore city has a total of 319 pockets of informal settlements comprising a total 46,650 households, distributed among five zones (Tamil Nadu Slum Clearance Board 2006). The informal settlements are often along ecological sensitive zones of the city and lack good living conditions, accessibility to essential services, and are more vulnerable to extreme climate events.

There is an urgent need to rethink and reimagine what future urban developments in Covai will look and function like. The onset of the global Covid-19 pandemic has also reinforced the need to create locally self-sufficient, adaptive, and liveable neighbourhoods. *How can we co-create resource-efficient, climate-resilient communities that add ecological, economic, and social value to the city?*

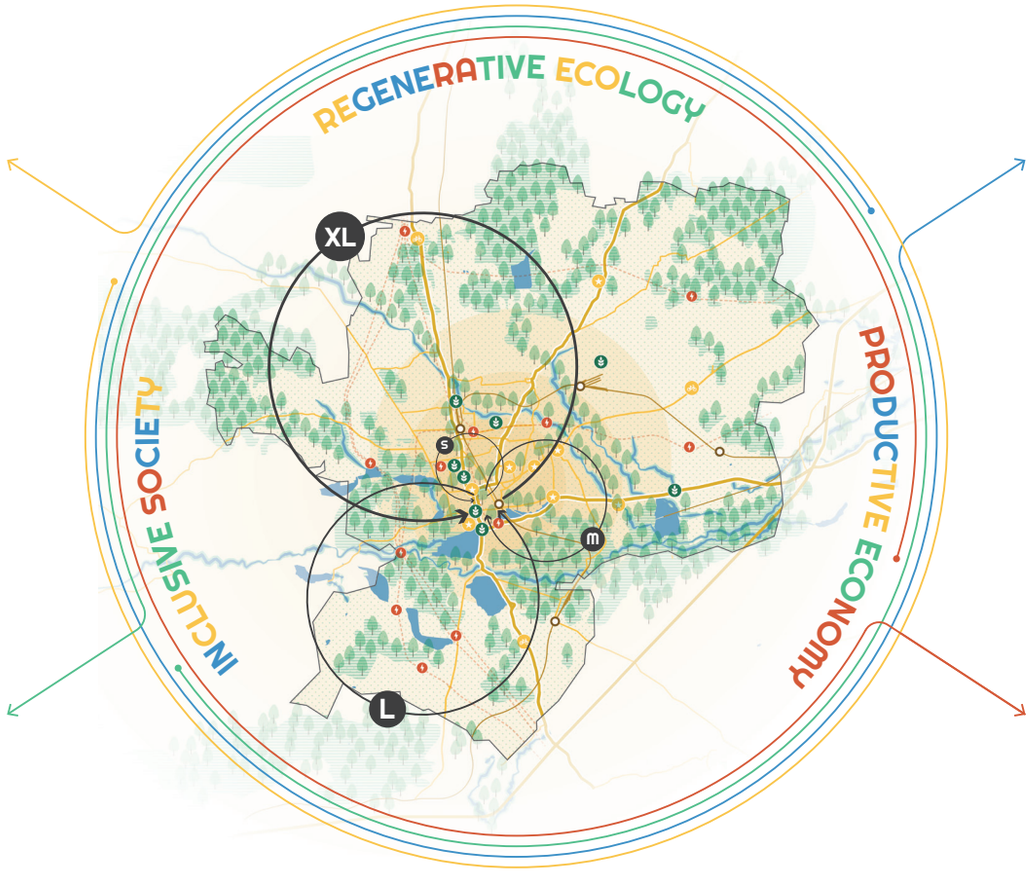


Fig 8: Goals and transcalarity of Circular Covai Vision

Our project aims to rethink how urban development happens in the city by placing 'Urban Circularity' at the forefront. Urban Circularity as the core lifestyle and planning value can amplify synergies and accelerate the goals of regenerative ecology, inclusive society, and a productive economy. Furthermore, it is a step towards aligning with the United Nations sustainable development goals and Coimbatore SUD-SC vision.

Loops as Leverage proposes an integrated approach to realise the Circular Covai Vision through a scalable urban circularity model that leverages the loops of PEOPLE, WATER, FOOD, and ENERGY to co-create a sustainable Covai.

ii. Glimpse into Koundampalayam

Koundampalayam ward is located adjacent to the Sanganoor Pallam in Ward No.9, West Zone of Coimbatore Municipal Corporation. The site has a size of around 105 acres abutting NH-181 to its east, connecting the city of Coimbatore to Gundlupet in Karnataka state via Mettupalayam. Koundampalayam area was added into the Coimbatore Corporation limits of the 100 wards in 2011. This area is strategically located close to the city centre of Coimbatore, the Coimbatore North railway station, and the state bus stand. The Sanganoor Canal that flows through the site is an important green-blue corridor that connects to the water systems of the city that feed into the Noyyal River.

The ward has a mix of private residential apartments, informal settlements adjacent to the canal, Tamil Nadu Housing Board Building Complex, vacant plots of the proposed Market Place, a capped landfill, and TNEB Solar park. The pattern of built areas is majorly residential with small- and medium-scale industries, while the commercial units including automobile showrooms, furniture showrooms, and eateries are located along the Mettupalayam Main Road. The site has a considerable amount of open spaces, out of which 45% are under government holdings. Based on these distinct features and potentials, the site has been recognised into five subsites.

1. Subsite A: Waste dumpyard that was converted into park and solar power plant (~17 acres)
2. Subsite B: Informal Settlements along Sanganoor Canal (~19 acres)
3. Subsite C: Open Land Parcels proposed for relocation of Dr MGR wholesale market. (~17 acres)
4. Subsite D: Predominantly residential Neighborhood connected to subsite-A through non-motorable narrow pathways. (~44 acres)
5. Subsite E: Tamil Nadu Housing Board with +1800 residential apartments (~10 acres)

The proposed urban development has the potential to transform it into a sustainable, self-sufficient community. The core strengths and potentials in each subsite can be integrated to mutually benefit each other. In other words, there exists a push towards energy transition in Subsite A, an ecological lifeline and allied informal communities living in Subsite B, a food source/market area to explore sustainable food practices in Subsite C, a typical neighbourhood where small scale circular initiatives can be implemented in Subsite D, and a dense residential area in Subiste E that can attract economic opportunities.

Can these be the stepping stones to creating India's First Circular Neighbourhood?

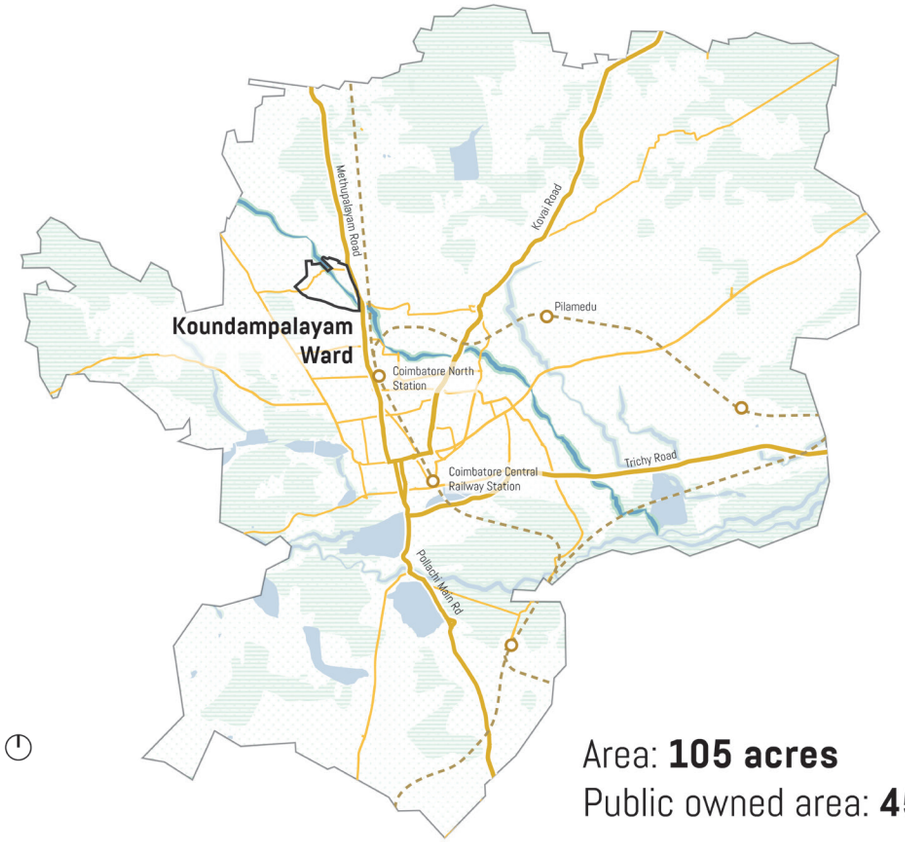


Fig 9: Location of Koundampalayam ward within Coimbatore Metropolitan Area

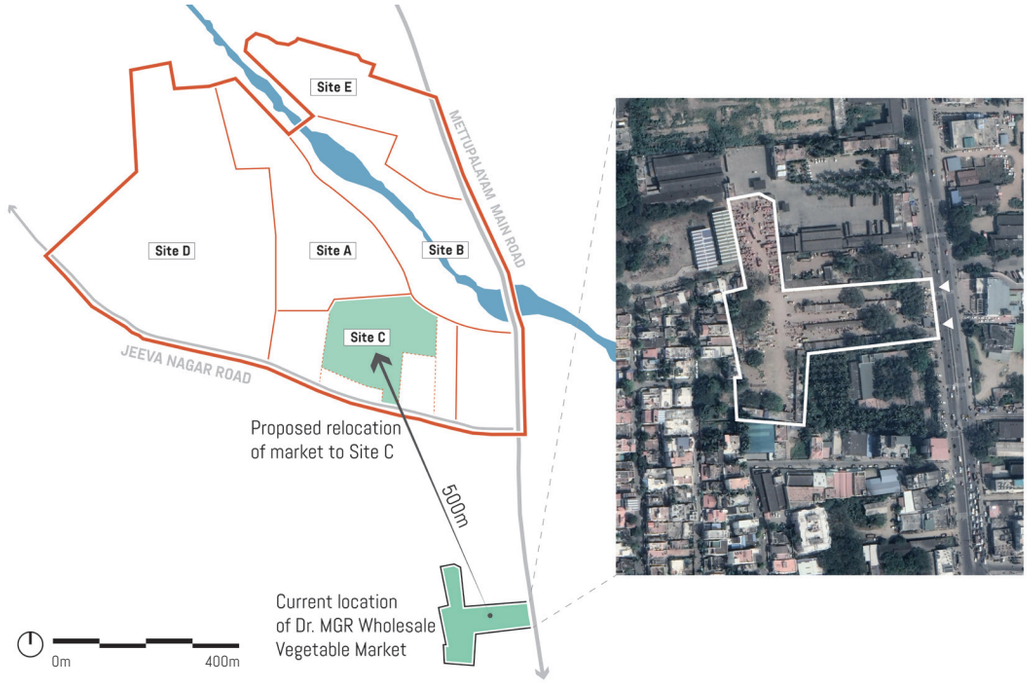


Fig 10: Proposed relocation of Dr. MGR Wholesale Vegetable Market

1. Mound
2. Solar Power Plant
3. Vacant Land (TWAD)
4. Land for Cemetary
5. MGR Nagar
6. Prabhu Nagar
7. Ambedkar Nagar
8. Anna Nagar
9. Govt. School
10. TNHB Apartments
11. Residential area
12. Informal Children's play area
13. Waste collection yard
14. TNEB Substation
15. Indira Nagar infromal settlement
16. Jeeva Nagar
17. Saibaba Colony

SANGANOOR STREAM

METTUPALAYAM MAIN ROAD

INDIRA NAGAR ROAD

JEEVA NAGAR ROAD

JEEVA NAGAR ROAD

METTUPALAYAM MAIN ROAD

0 50 100 150 200m

Fig 11: Satellite image showing the feature in and around Koundampalayam ward

Fig 12: View of drinking water infrastructure in Koundampalayam ward. Source: GIZ India

Fig 13: View of Solar plant and TNHB apartments from the mound. Source: GIZ India

iii. Urban Circularity

The concept of 'Urban Circularity' aims to redesign the flow of resources such as water, food, energy, waste, building materials, and so on, that drive urban activities. The overall goal is to transition from a linear model of resource flow (make, use, dispose) to a circular model of resource flow (make, use, reuse and recycle back into the system). In this model, the value of the resource is retained rather than destroyed, when we repurpose it. The circular cities approach studies the life cycle of resources where they originate, how they are processed, how they are used, where they go after use, to understand potential points of intervention to tweak the cycle.

Why do we need Circular Cities?

In an era where the urgency of climate change and the need to shift to sustainable means of resource production and consumption is of utmost importance, it is pertinent that the built environment reflects this.

The proportion of the global population living in cities and towns is expected to rise from 54 per cent in 2015 to 66 per cent by 2050, which will result in a significant expansion of existing cities, as well as the construction of new cities. Without a new approach to urbanization, material consumption by the world's cities will grow from 40 billion tonnes in 2010 to about 90 billion tonnes by 2050. Therefore, the resource use implications and environmental impacts of urbanization are significant. Resources should now become a central policy concern, in addition to concerns about climate change. (Swilling & Hajer, 2018)

The circularity approach is meant to increase the efficiency and effectiveness of city assets and products by extending either their own or their constituents'/ components' utilization and lifetime. This increase is achieved by applying targeted action items ... on city assets and products, such as sharing, recycling, refurbishing, reusing, replacing, and digitizing. In general, a circular economy is an economic system where products and services are traded in closed loops or 'cycles'. A circular economy is characterized as an economy, which is regenerative by design, with the aim to retain as much value as possible of products, parts, materials and resources. (U4SSC, 2020)

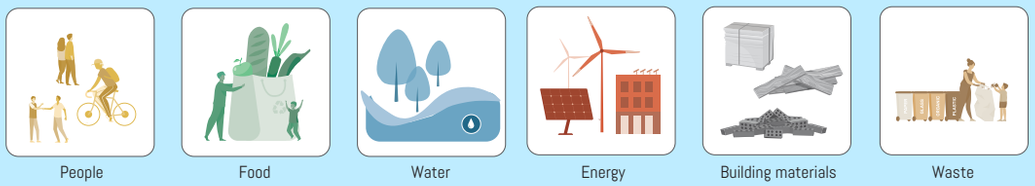


Fig 14: Resource flows that can be studied to apply the ciruclarity approach

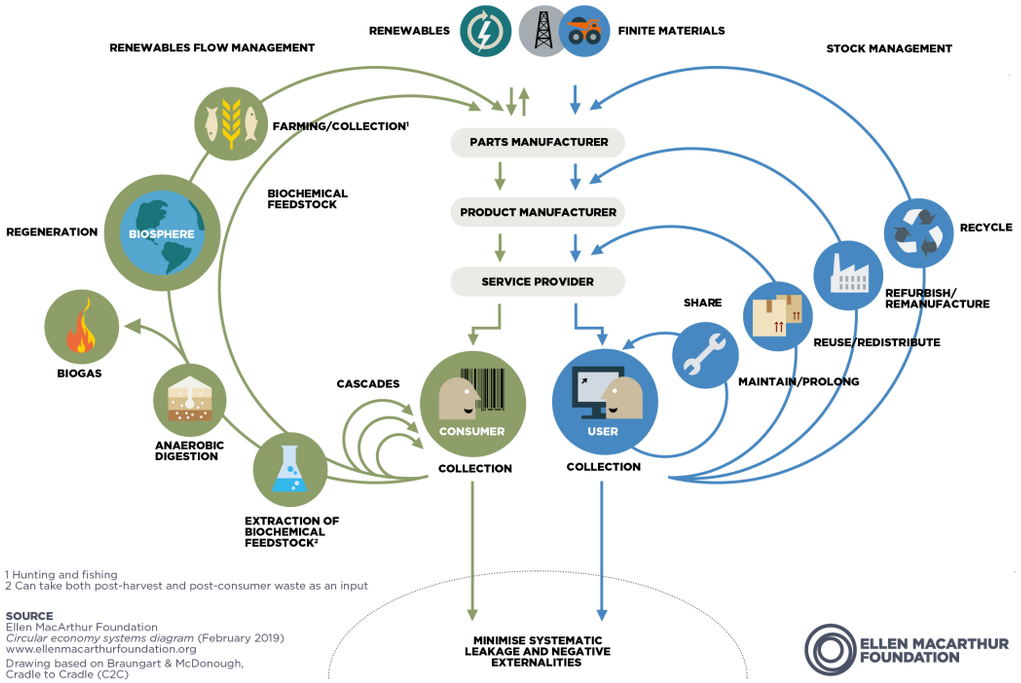


Fig 15: Circular Economy Systems Diagram Source: Ellen MacArthur Foundation, 2017

Building circular cities is one of the biggest challenges of this century and this requires fundamentally rethinking the way our urban systems are organised. It looks at potential interdependencies between flows such as water and food or food and waste, and creates pathways for mutual exchanges. For example, instead of letting organic food waste from urban areas be dumped in a landfill, it can be composted to be reused in food production. Implementing the circular approach in urban development can bring tremendous economic, social, and environmental benefits. It can foster the emergence of:

1. ***Thriving cities*** *in which economic productivity increases through reduced congestion, eliminated waste, and reduced costs. New growth and business opportunities support skills development and jobs.*

2. ***Liveable cities*** *with improved air quality, reduced pollution, and enhanced social interactions.*

3. ***Resilient cities,*** *reducing reliance on raw materials by keeping products in use and balancing local production with global supply chains.*

These benefits can be achieved by changing the way urban systems are planned, designed, and financed, and how they are made, used, and repurposed. (Ellen MacArthur Foundation, 2017)

iv. Global best practices in Circularity

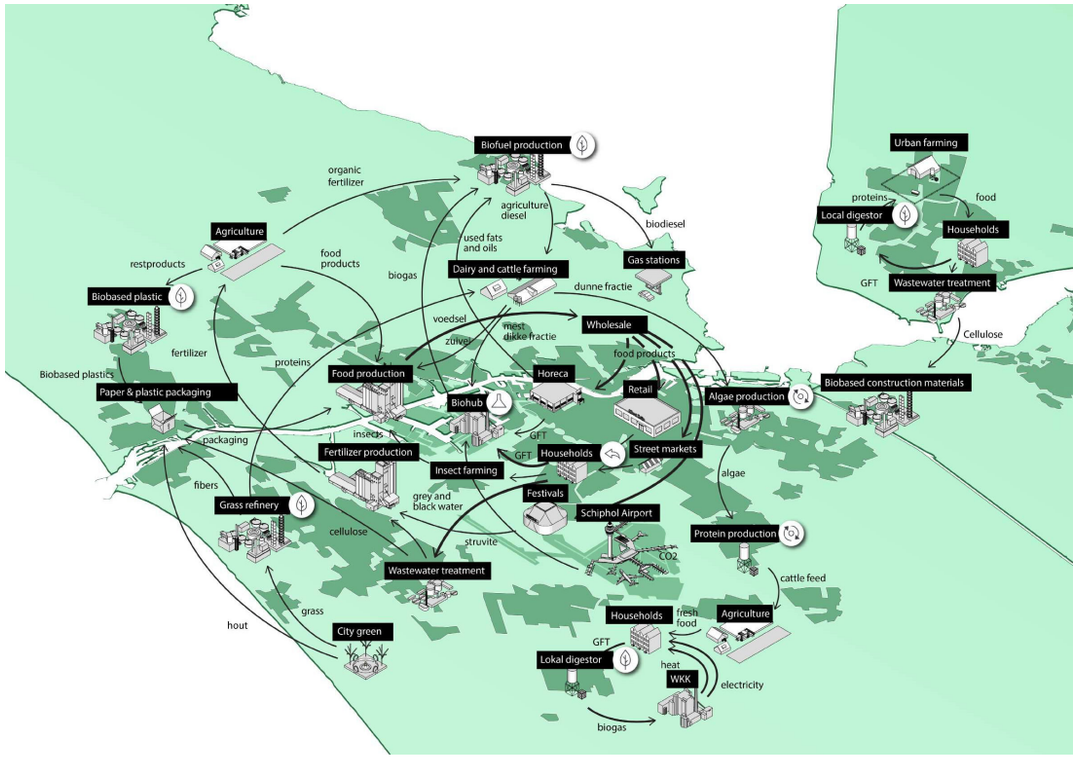
The goals and objectives of building circular cities align with the United Nations Sustainable Development Goals (UN SDG). The strongest relevance lies in Goal 6- Clean Water and Sanitation, Goal 7- Affordable and Clean Energy,
Goal 8- Decent Work and Economic Growth, Goal 10- Reduced Inequalities, Goal 11- Sustainable Cities and Communities,
Goal 12- Responsible Consumption and Production. Several cities in the world have already adopted the circular cities model like Amsterdam, Brussels, Capetown, Glasgow, London, San Francisco, and Toronto.

Brussels- BE Circular:
The Brussels Regional Programme for a Circular Economy (BRCPE), commonly referred to as Be Circular, is Brussels' central circular economy initiative from which all other circular economy activities emanate. It is designed to harness the opportunities presented by a circular economy, including reconciling economic and environmental objectives, supporting local production, optimising land use, and integrating transportation requirements. Be Circular is a four-year initiative, launched in 2016. The initiative focuses on five key economic sectors: retail, logistics, waste and resources, food, construction, and the built environment. BRCPE pursues 3 general objectives:

1. Transforming environmental goals into economic opportunities.
2. Relocating the economy in Brussels in order to produce locally where possible, reduce travel, optimize the use of the territory and create added value for the inhabitants of Brussels.
3. Contribute to job creation. (Ellen MacArthur Foundation, 2017)

Circular Amsterdam:
In 2015, the city of Amsterdam commissioned the world's first city-wide Circular Economy Scan 2015 to gain an overview of the key material flows in the city and understand the potential economic and environmental benefits of keeping these materials in higher-value uses. These included job and GDP creation, lower greenhouse gas emissions and waste disposal. The city focused on two concrete value chains – Construction and Food – to render the concept tangible. The City Scan method laid a roadmap for the practical implementation of circularity in the city and region. The method consisted of four phases:

1. Mapping of material flows and added value
2. Evaluation and selection of chains
3. Envisioning an ideal circular future project selection and formulation of action points.
4. The actions were also assessed on four main effects: value creation, CO2-reduction, material savings, and job growth. (Circular Amsterdam, 2016)



Healthy and sustainable food for the people of Amsterdam:

The Zuidoost Food Forest is an initiative of the residents of the K-district in Amsterdam. This forest is managed by the residents and includes berry bushes, herbs, fruit trees and vegetables. In addition, this initiative stimulates social cohesion between different generations and population groups, increases biodiversity and makes the neighbourhood more resistant to rising temperatures in the city.

A circular approach to developing the existing city:

By 2025, 50% of all renovations and building maintenance activities in Amsterdam will follow the principles of circular construction. In the coming years, Amsterdam will be renovating and replacing hundreds of kilometres of its canal banks. The canal bank along Rechtboomssloot is being replaced with a new bank made of circular concrete and will be maintained using emissions-free vehicles and equipment.

Fig 16: (above) Spatial Visions for Construction and Food Flows. Source: Circular Amsterdam, 2016
Fig 17: (below) Case studies from Amsterdam Circular vision Source: Circular Amsterdam, 2016

v. Circularity in Indian Cities

India is undergoing a rapid urbanisation trend with the number of towns and cities increased drastically over the last two decades. India's total population has increased from 238. 4 million in 1901 to 1210 million in 2011 (Census India, 2011). The urban population has gone up by 40%. The growth is expected to continue in the years to come and India is setting up its game to catch up with this change in a sustainable way. In order to drive the nation's sustainable urban development goals and accelerate better livelihood, including all perspectives of urban life and envisaging an inter-sectoral approach is paramount.

The United for Smart Sustainable Cities (U4SCC) identifies circularity as one component of a smart city that could embrace an inter-sectoral approach, and therefore, one may broadly interpret a Smart City as an umbrella version of a circular city. The Smart Cities Mission of India identifies some features of a Circular City, such as mixed land-use, reduced resource depletion and pollution, and digitization to improve overall well-being and reduce the vulnerability of residents. These are echoed in indicators to measure a city's circularity. Furthermore, the Ministry of Environment, Forest and Climate Change (MoEFCC) is successfully promoting the use of NAMAs (Nationally Appropriate Mitigation Actions) as one of the mechanisms to mitigate greenhouse gas emissions in India.

Under the Smart City Coimbatore Vision (2017), the city is envisioned to be an inclusive, secure, and effectively governed metropolis that offers the highest quality of living by providing universal best-in-class civic services, enabling seamless mobility, fostering a dynamic economy and nurturing clean, resilient, and sustainable environment. These national-, state-, and city-level programmes provide a valuable platform to integrate the principles of circularity and seek mutual synergies.

Fig 18: Relevance of the project to UNSDG and National Smart Cities Mission

Fig 19: TNEB Electrical sub station viewed from jeeva nagar road. Source: GIZ India

2 Circular Covai Vision

Fig 20: Sanganoor stream running from North towards South east. Source: GIZ India.

i. Loops as Leverage

Circularity attempts to rethink and redesign the flow of resources such as water, food, energy, and building materials that drive urban activities, in a circular manner towards the reuse of resources and thus closing the loop, rather than disposing of them as waste.

> ***Loop (noun):*** *a structure, series, or process, the end of which is connected to the beginning. Within this project, we refer to circular flows as opposed to linear flows as loops.*
>
> ***Leverage (verb):*** *use (something) to maximum advantage. Within this project, we aim to maximize the benefits of existing assets.*

In the case of Koundampalayam, some of this rethinking of resource usage is already happening in the form of solar plants, mound parks, and waste management units. The idea of rethinking resource usage as circular loops are not only beneficial from the infrastructural and environmental perspectives, but also the social, economic, and cultural perspectives.

Through skillful rethinking and integration of circular loops in the market area and the surrounding public domain, we can leverage the same loops for wider societal benefit economically, socially, culturally, and environmentally.

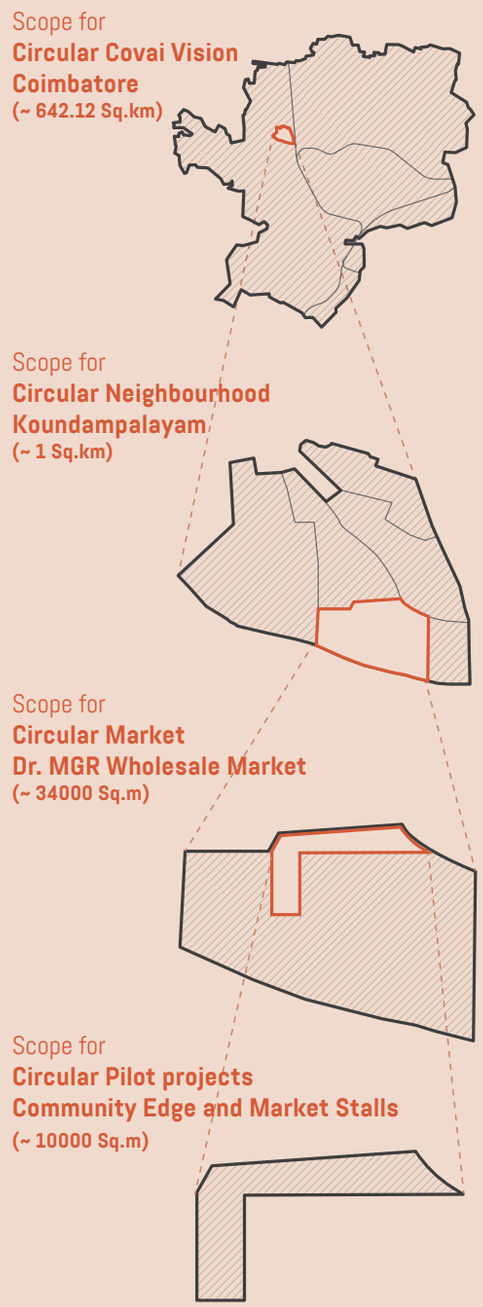


Fig 21: Scheme showing transcalarity of the project

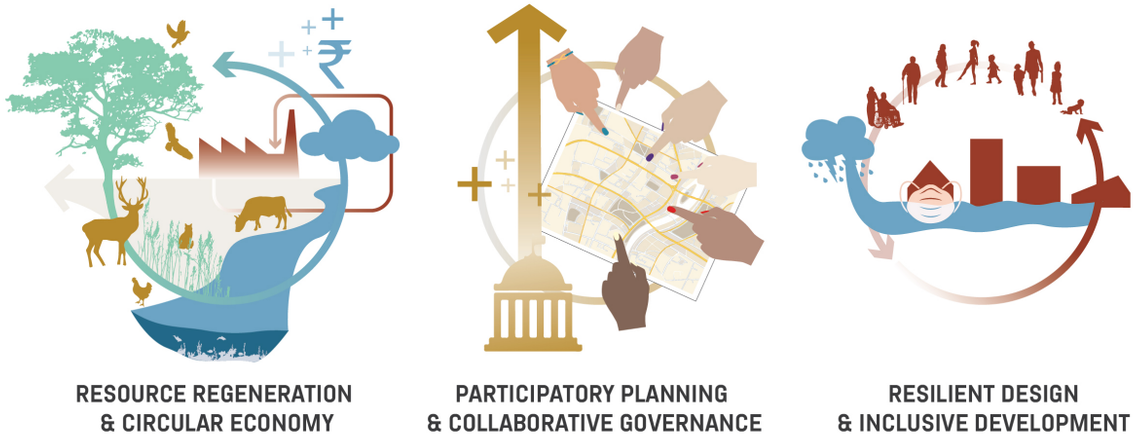


Fig 22: Pillars of Planning and Design

To give an example in the market area, if we are to rethink unsold produce from ending up in landfills, we could propose a food bank that connects unsold products to the needy communities or an organic waste compost pit that converts unsold produce to manure or waste to energy biogas digester that converts unsold produce to energy. In each of these examples, unsold produce is looked at as a resource that is not to be thrown away as waste, but reused, closing the loop and in the process leveraging the loop for additional societal benefits as mentioned above.

To rethink the resource flows, three overarching pillars for planning and design were outlined in alignment to the vision and goals:

1. Resource Regeneration & Circular Economy
2. Participatory Planning & Collaborative Governance
3. Resilient Design & Inclusive Development

The project aims to implement the circular vision across four scales: city, neighbourhood, subsite, and pilot projects. The transcalarity of the proposal thus tests the validity of circular concepts and its impact on the local scale as well.

ii. Circular Vision for Covai

Based on the lessons learnt from global practises in Urban Circularity, a Circular Covai Vision was formulated that states the goals and pathways for achieving circularity in Coimbatore.

Circular Covai Vision imagines Coimbatore as a pioneer and national leader in developing circular cities in India, complementing the city's Smart Cities Mission and Solar Cities Mission. The city is envisioned to be a resource-efficient, robust and resilient urban agglomeration of the future, with specific emphasis on the resource flows of people, water, food, and energy. The quality and interdependencies between the resource flows are augmented through specific tools or guidelines, in order to create locally self-sufficient LOOPS. The loops can be scaled up or scaled down to build city-wide or regional resource networks.

Three broad goals that align with the United Nations SDG and National Smart Cities Mission were identified to guide the Circular Covai Vision, namely:

1. **Regenerative Ecology:** Circular Covai Vision aims to regenerate the city's ecology and blue-green networks by rethinking resource loops like water, food that affect the natural ecosystem. The overarching goal is to increase the city's climate resilience and biodiversity.
2. **Productive Economy:** The resource-efficient and optimised loops can boost the local economy, creating new connections between complementary resource loops. A productive economy is a key motivator to drive the agenda of circularity in Covai and finance ecological and social transformations.
3. **Inclusive Society:** The benefits of any large scale socio-technical transition must filter down to the local communities and stakeholders. Circular Covai Vision puts people at the driving seat of circularity with the Circularity Toolbox, which enables and equips them with the knowledge to implement small scale systemic changes.

These goals aim to be the foundations for creating India's First Circular City, an unique distinction for Coimbatore, which is already part of pioneering initiatives like the National Solar Cities Mission and Smart Cities Mission. However, while this project outlines a vision for the city, adopting this vision into law and policy will require additional studies to understand resource flows, economic interdependencies, and spatial requirements to transition to a circular society.

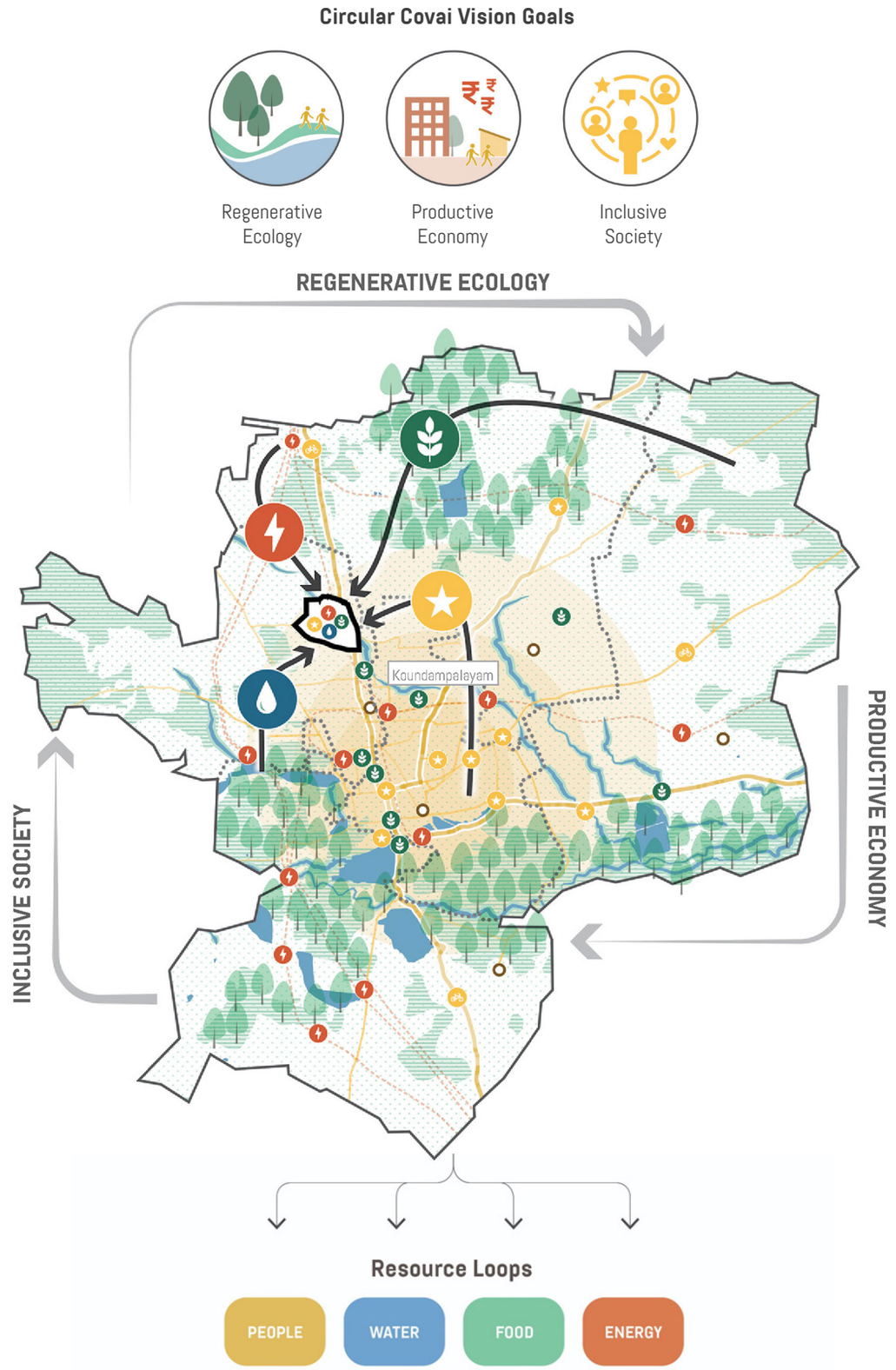


Fig 23: Circular Covai Vision and the link between project goals and the chosen loops

iii. Circular Neighbourhood

The project aims to translate the Circular Covai Vision in Koundampalayam Ward, by outlining a Circular Framework that comprises 4 loops (people, water, food, energy) in order to translate the larger regional vision on the local scale. The Circular Vision for Koundampalayam reimages the ward to be a model circular neighbourhood that can serve as a guiding example for the rest of the city. The existing spatial infrastructure, programs and assets on site that correspond to the four loops will also benefit from the circular initiatives on the site.

Strategic loops for Koundampalayam:

Each loop is broken down into four distinct stages or actions, and potentials and challenges were identified, in order to propose specific solutions at each stage of the loop lifecycle. The below listed are the assets present within the sites for leveraging circularity across all 4 loops:

1. **People Loop:** Informal settlements, TNHB Apartment, Residential neighbourhood in Subsite D, Mettupalayam Road, Jeeva Nagar Road
2. **Water Loop:** Sanganoor canal, Govt. owned Open spaces
3. **Food Loop:** Proposed MGR wholesale market, Residential communities
4. **Energy Loop:** Solar Park, TNEB substation, Small- and Medium-scale industries

The schemes on this page show how the resource loops can be closed/connected on the site to mutually benefit each other.

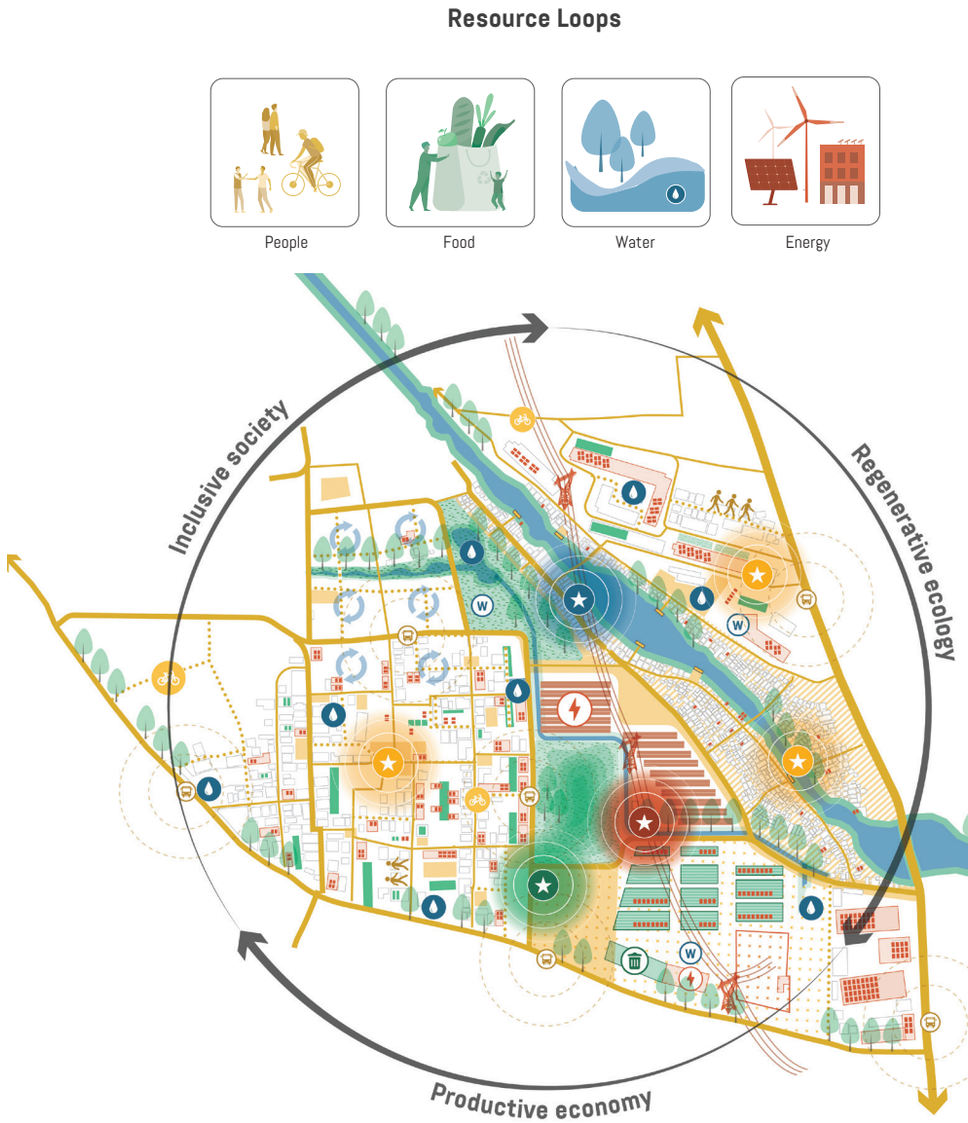


Fig 25: Schematic section showing how resource loops can be closed across the project site

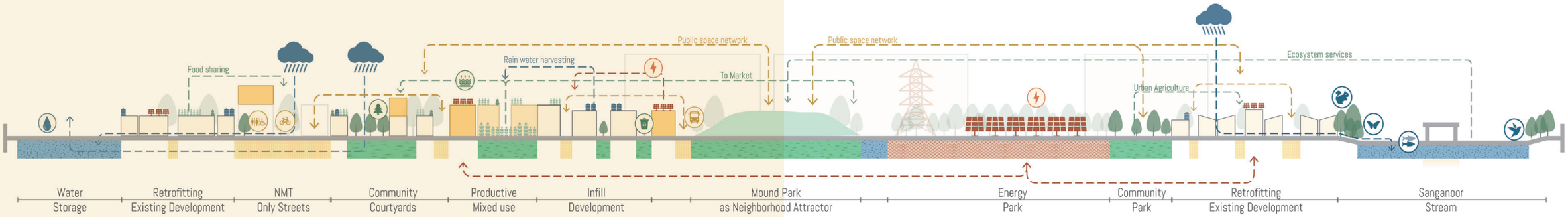


Fig 24: Schematic section showing how resource loops can be closed across the project site

Toolbox for Circular Neighbourhoods

Fig 26: Waste collection and composting plant polluting surrounding residential colonies. Source: GIZ India

i. Circularity Toolbox

Circularity, though the most relevant philosophy in today's world to fuel our growth in an equitable manner, is not a common concept in the spatial planning and design domain. Hence, in order to simplify the complex boundaries of circularity, burst the myths around it, and make it part of the regular planning and design vocabulary, the Circularity Toolbox has been developed.

The Circularity Toolbox could offer the following benefits:

- Simplifies complex inter-relationships between different resource systems and identifies potential synergies.
- Enables uniformity and consistency across different stages of works through the simple numbering and naming system.
- Makes communication with citizens inclusive and effective.
- Embeds Scenario Building exercise as a planning process
- Facilitates capacity development for governmental and non-governmental stakeholders

The four loops and their guiding actions structure the Circularity Toolbox

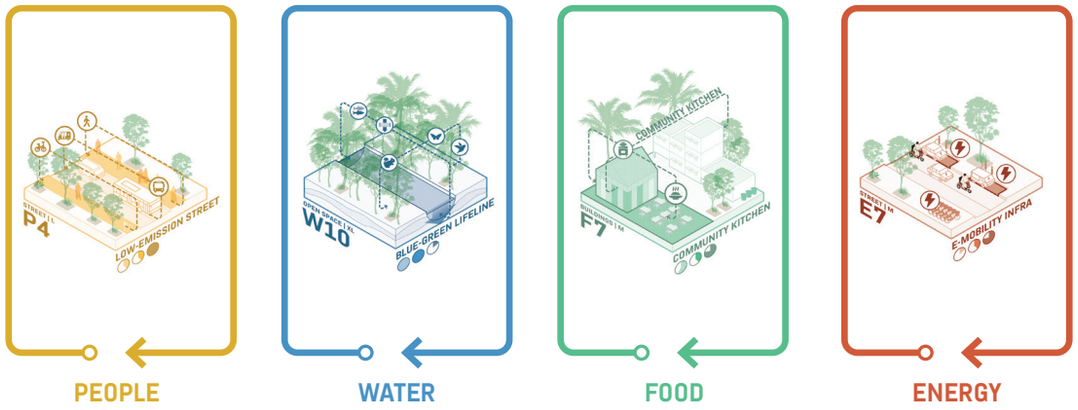
- **People**: Live-Move-Work-Engage
- **Water**: Collect-Treat-Release-Restore
- **Food**: Produce-Trade-Consume-Compost
- **Energy**: Generate-Distribute-Utilize-Conserve

In order to leverage circularity through the four loops, the parts or pieces that can complete circularity have been broken down as simple tools. Each loop has four guiding actions which inform how circularity could be achieved. Each guiding action is provided with three tools which collectively form the Circularity Toolbox with 48 tools. A tool here stands for specific planning or design intervention.

Each tool block is mapped with:

- Tool number that serves as a unique identification code
- Tool name
- Spatial unit or nature of intervention - Open Space, Street, Building, Programming
- Scale of intervention (XL, L, M, S)
- Representative ecological, social, and economic values cumulatively represent the circularity coefficient.

In addition, each tool is also strengthened with rich information through icons and circuits to represent the functionalities of the tool. In the following pages, each loop is explained in detail with the tools that help in its implementation.



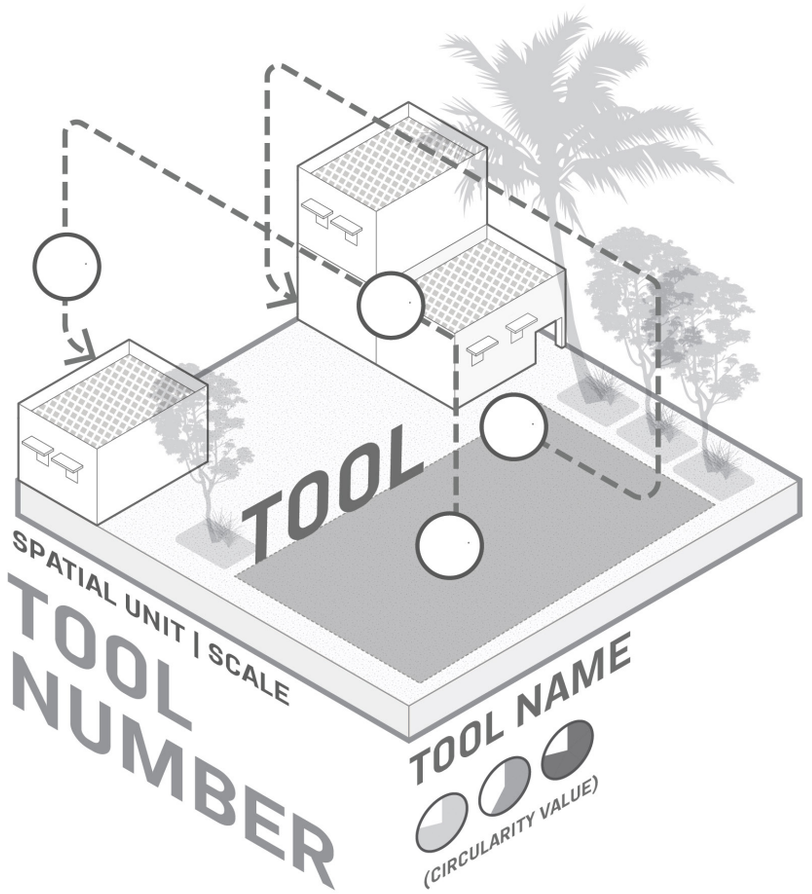


Fig 27: Scheme showing how to read the tools illustrated in the following pages for every loop

ii. People Loop

People Loop interlinks the common actions of Live - Move - Work - Engage. The primary focus areas here include enhancing livability, promoting sustainable mobility, improving economic viability, and sharing social amenities. The People Loop aims to tie together the day-to-day activities of citizens through strategic tools. In an overarching context, the tools are meant to enhance the liveability of neighborhoods and improve the lives of people.

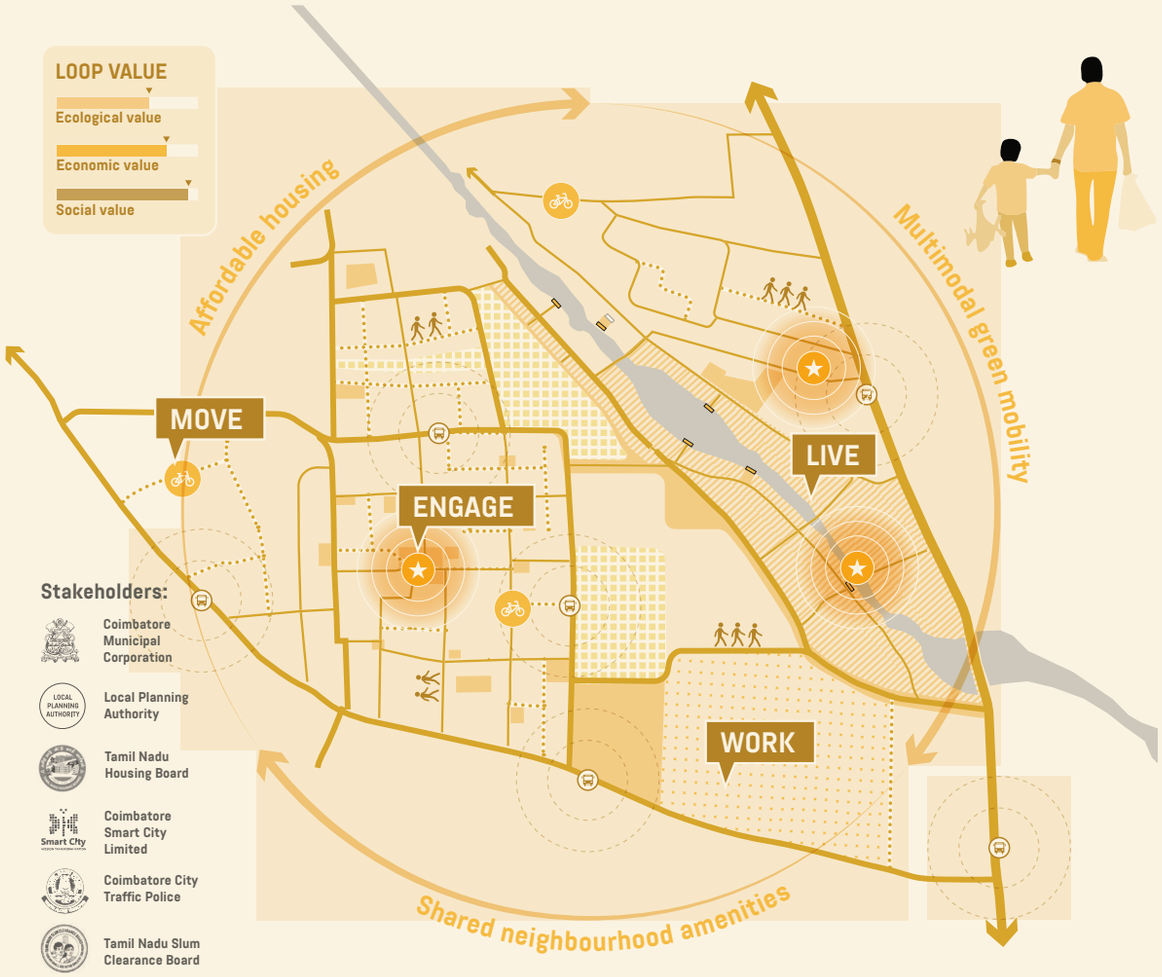


Fig 28: Scheme showing the spatial implementation of the tools from People loop and stakeholders involved

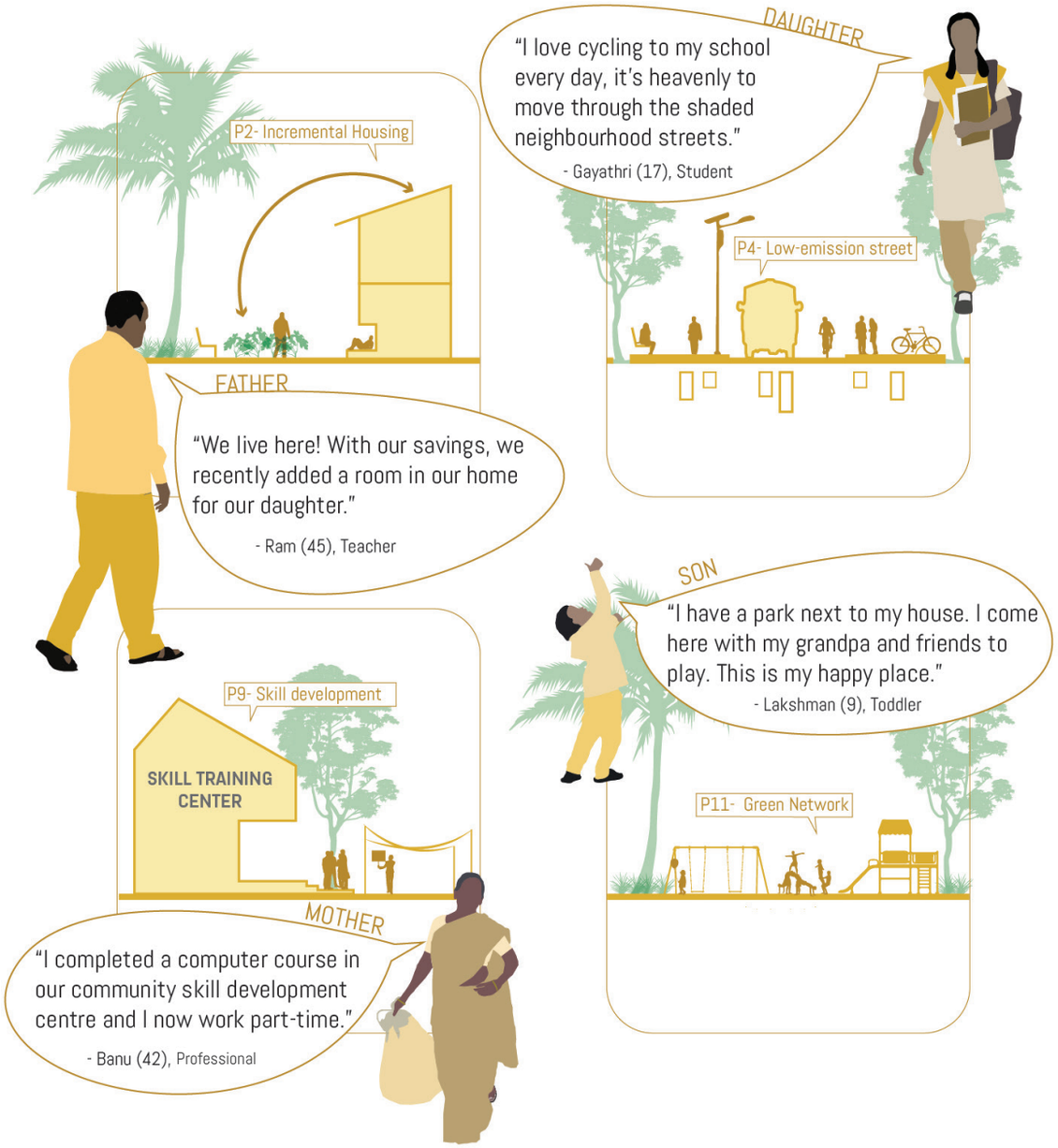


Fig 29: Storyboard showing how the People Loop will have an impact on everyday lives

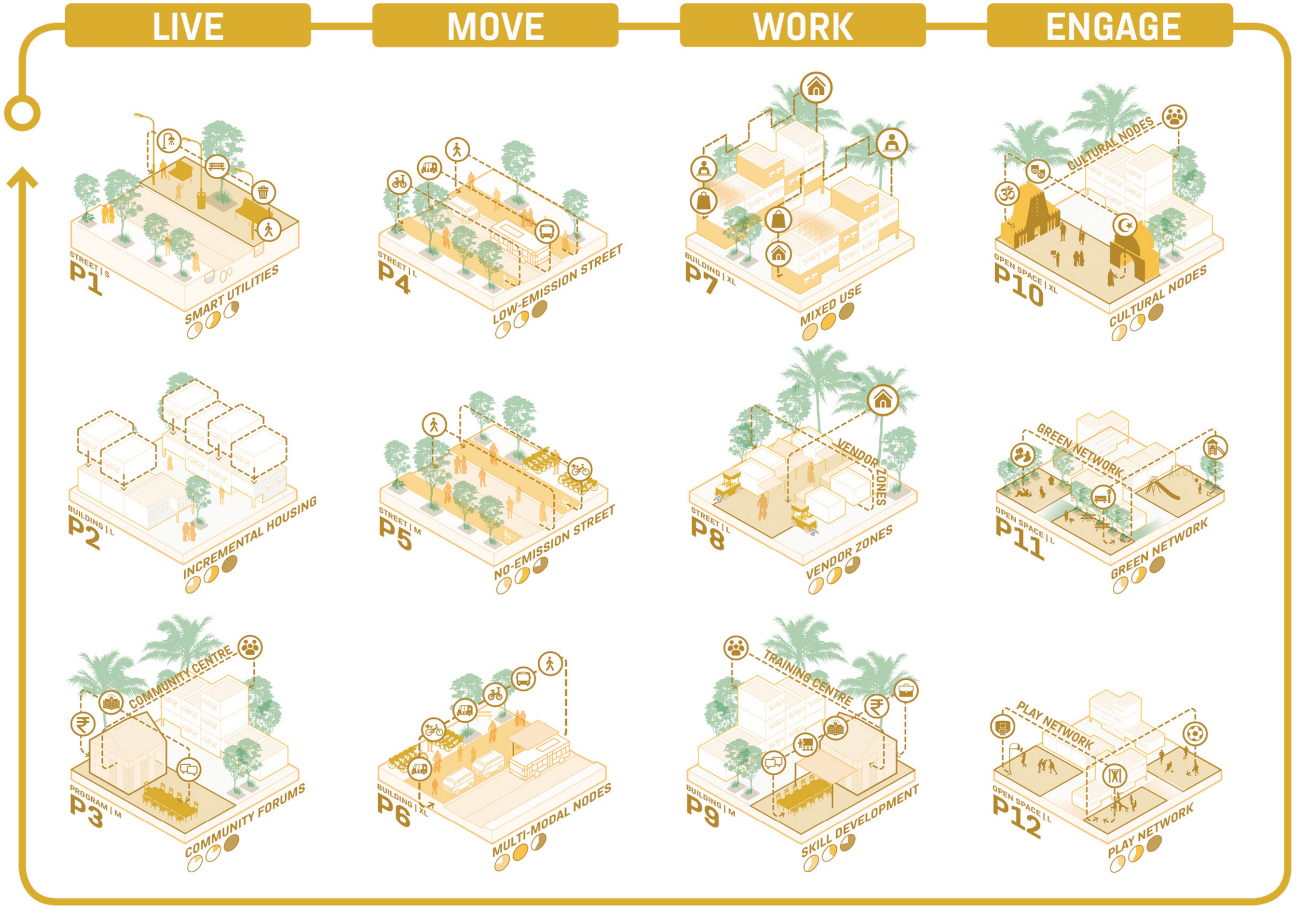


Fig 30: Tools for People Loop

iii. Water Loop

Water Loop articulates the actions of Collect - Treat - Release - Restore. The primary focus areas here include harvesting rainwater, optimizing resources, restoring biodiversity, and rejuvenating natural systems. The Water Loop aims to prolong the presence and use of water through strategic tools. In an overarching context, the tools are meant to regenerate natural resources and nurture water-sensitive communities.

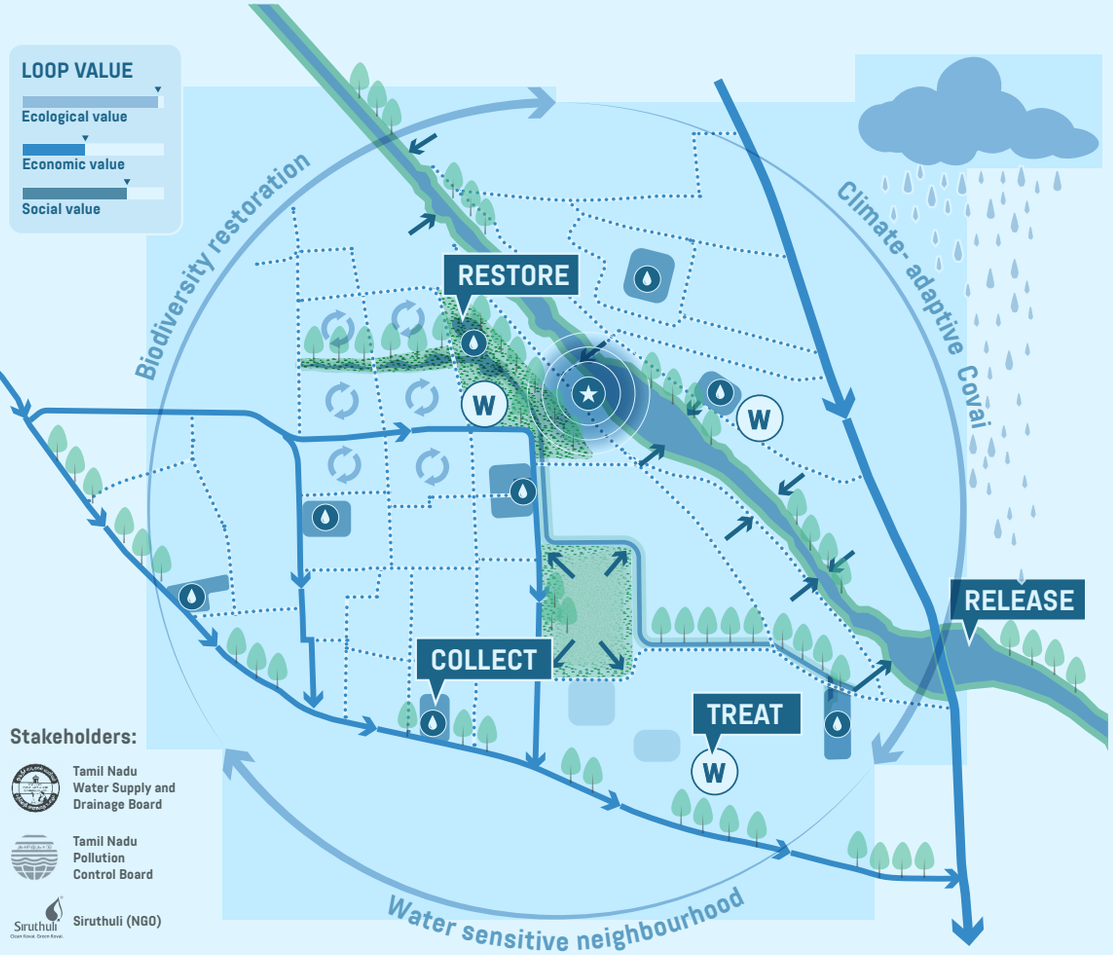
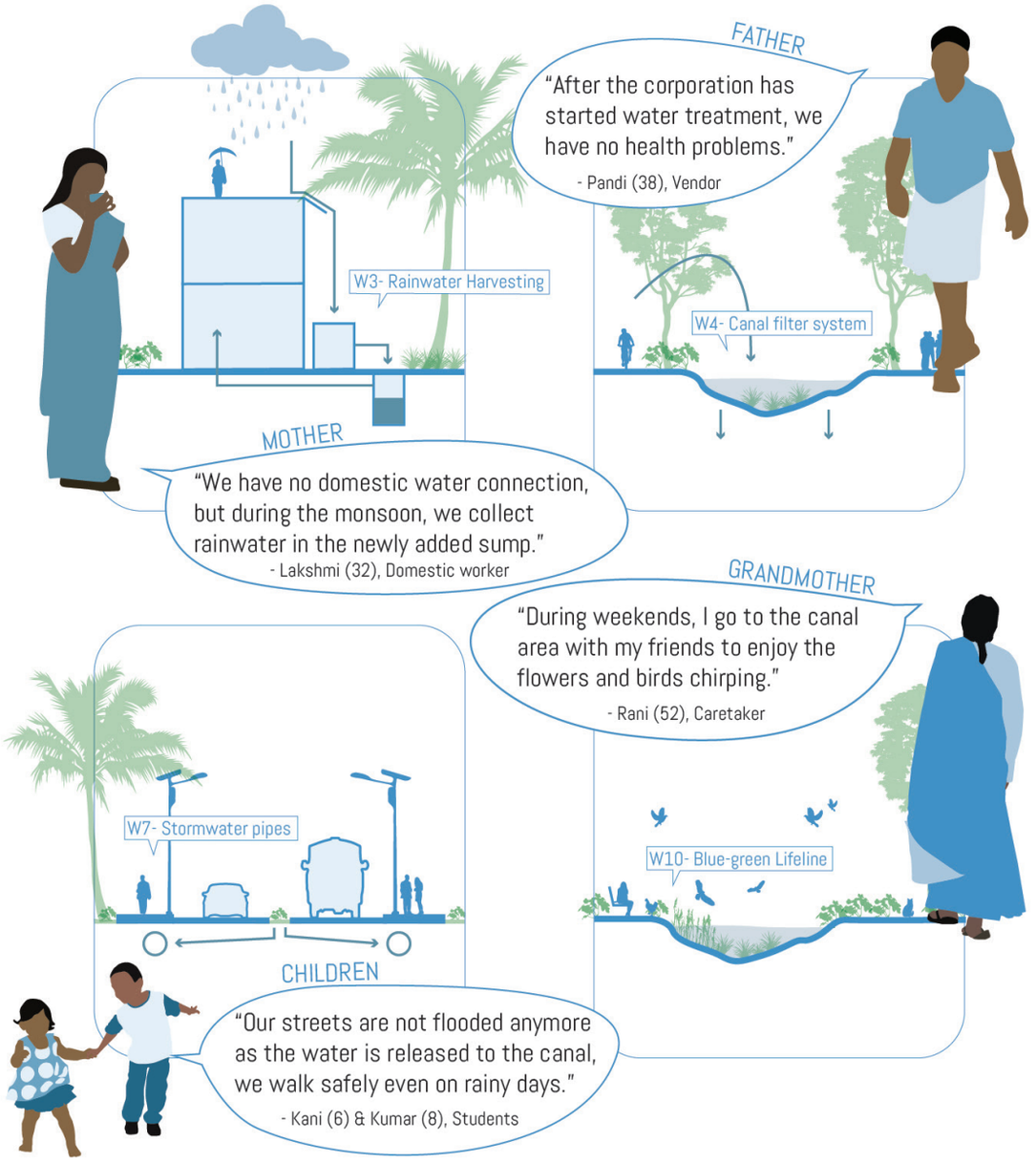


Fig 31: Scheme showing the spatial implementation of the tools from Water Loop and stakeholders involved



Collect. Treat. Release. Restore

Fig 32: Storyboard showing how Water Loop will have an impact on everyday lives

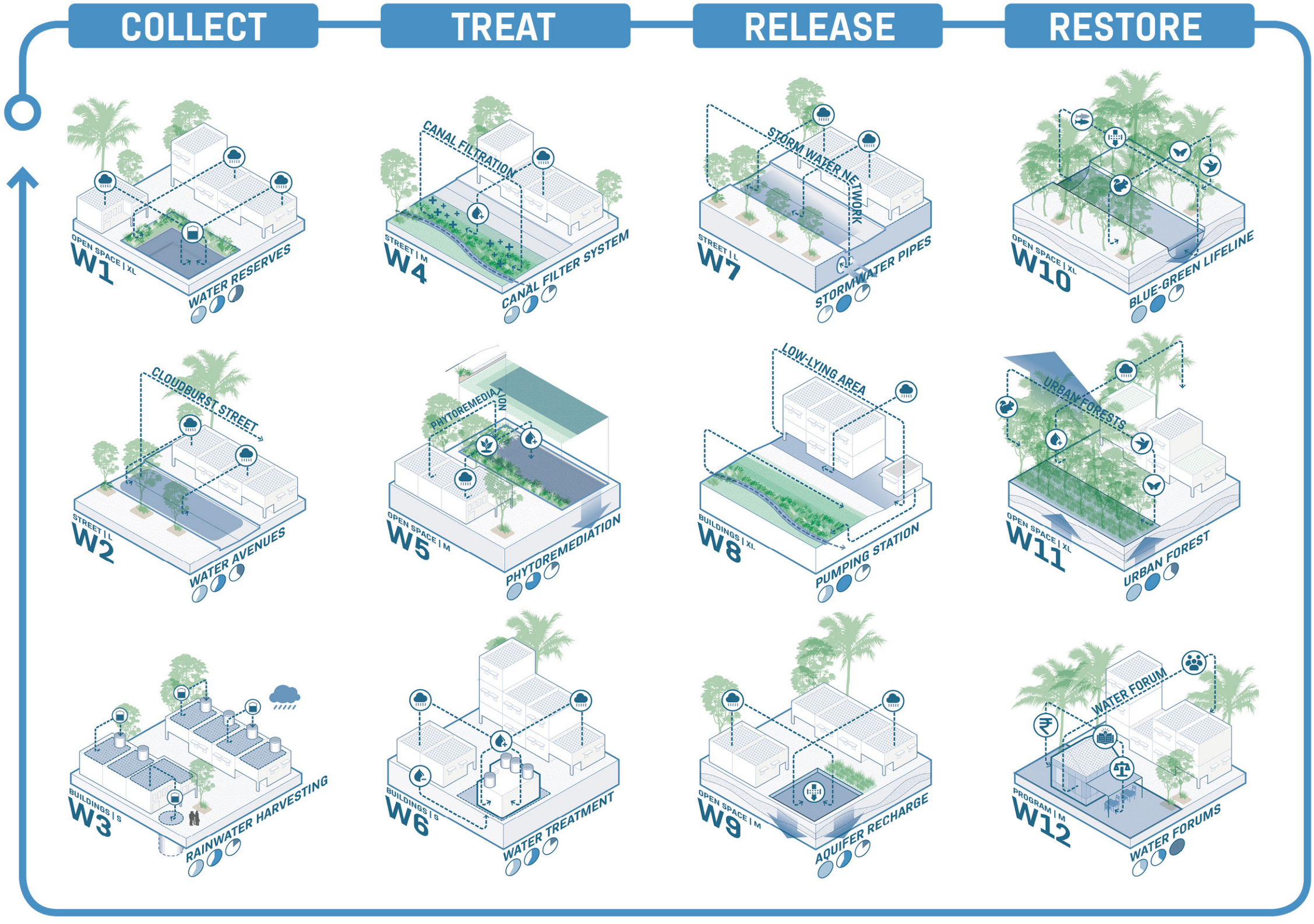


Fig 33: Tools for Water Loop

iv. Food Loop

Food Loop articulates the actions of Produce - Trade - Consume - Compost. The primary focus areas here include enabling self-sufficiency, managing produce, monitoring health, and managing waste. The Food Loop aims to test model neighbourhoods that focus on local production as well as city-level distribution and management through strategic tools. The tools for the food loop are structured to kindle a self-sufficient community that is sensitive to the entire food cycle.

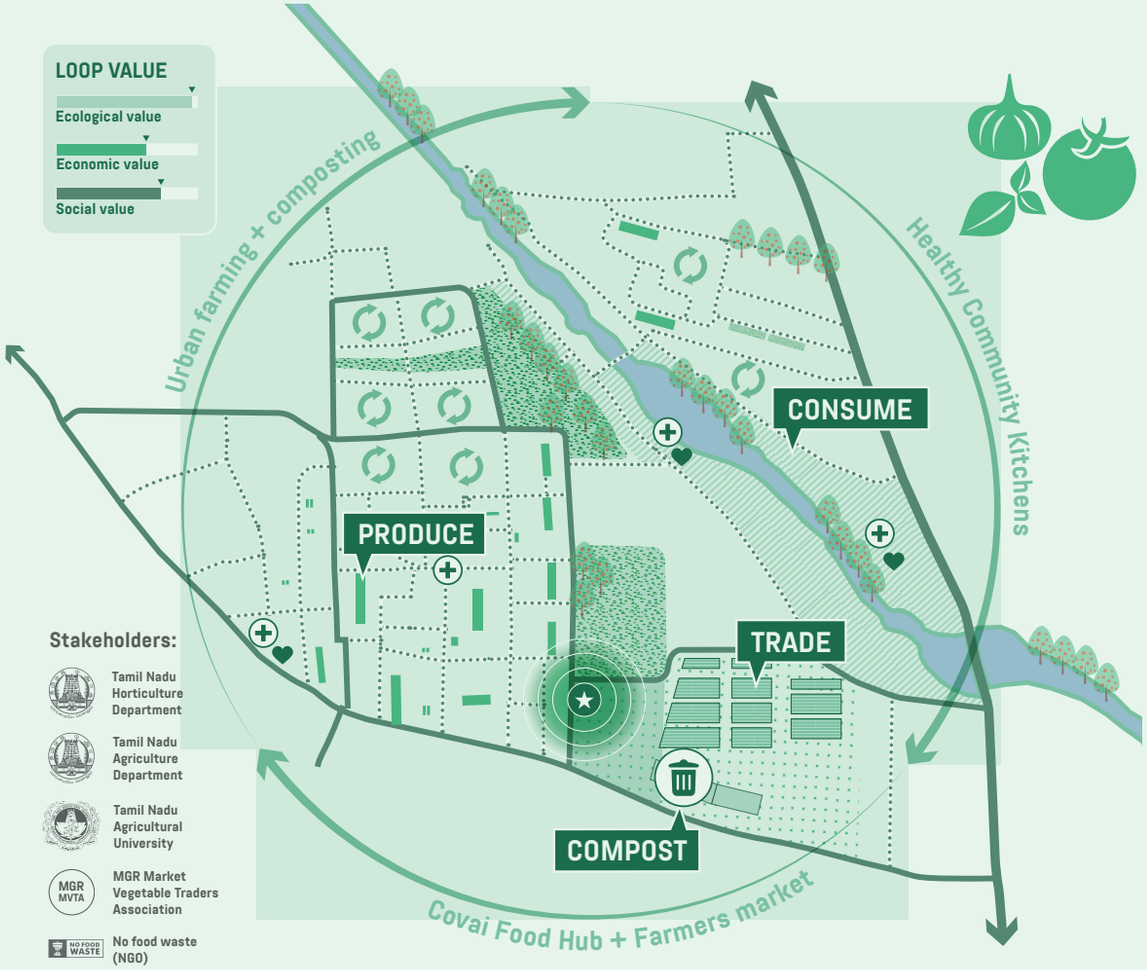
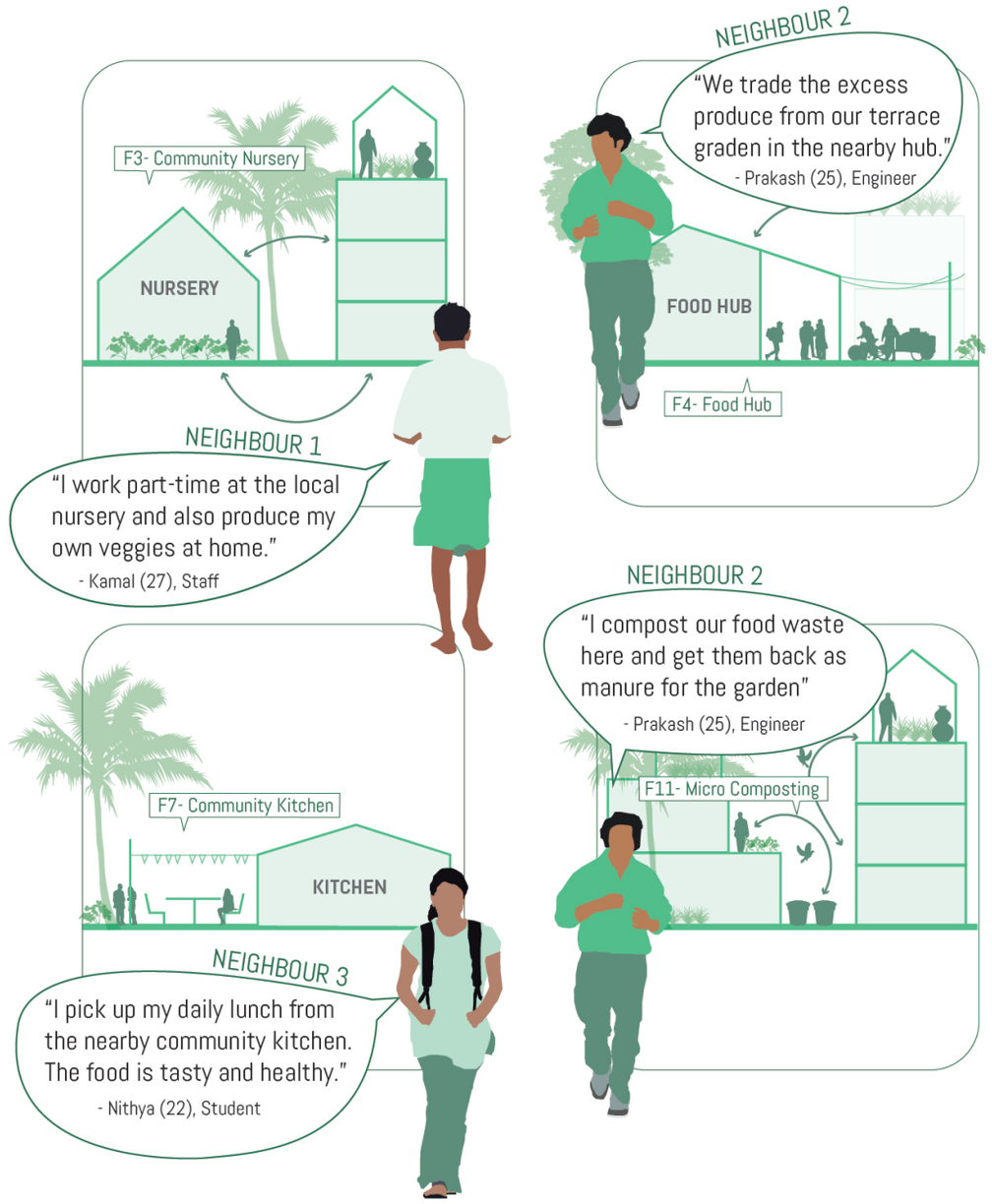


Fig 34: Scheme showing the spatial implementation of the tools from Food Loop and stakeholders involved



Produce. Trade. Consume. Compost

Fig 35: Storyboard showing how Food Loop will have an impact on everyday lives

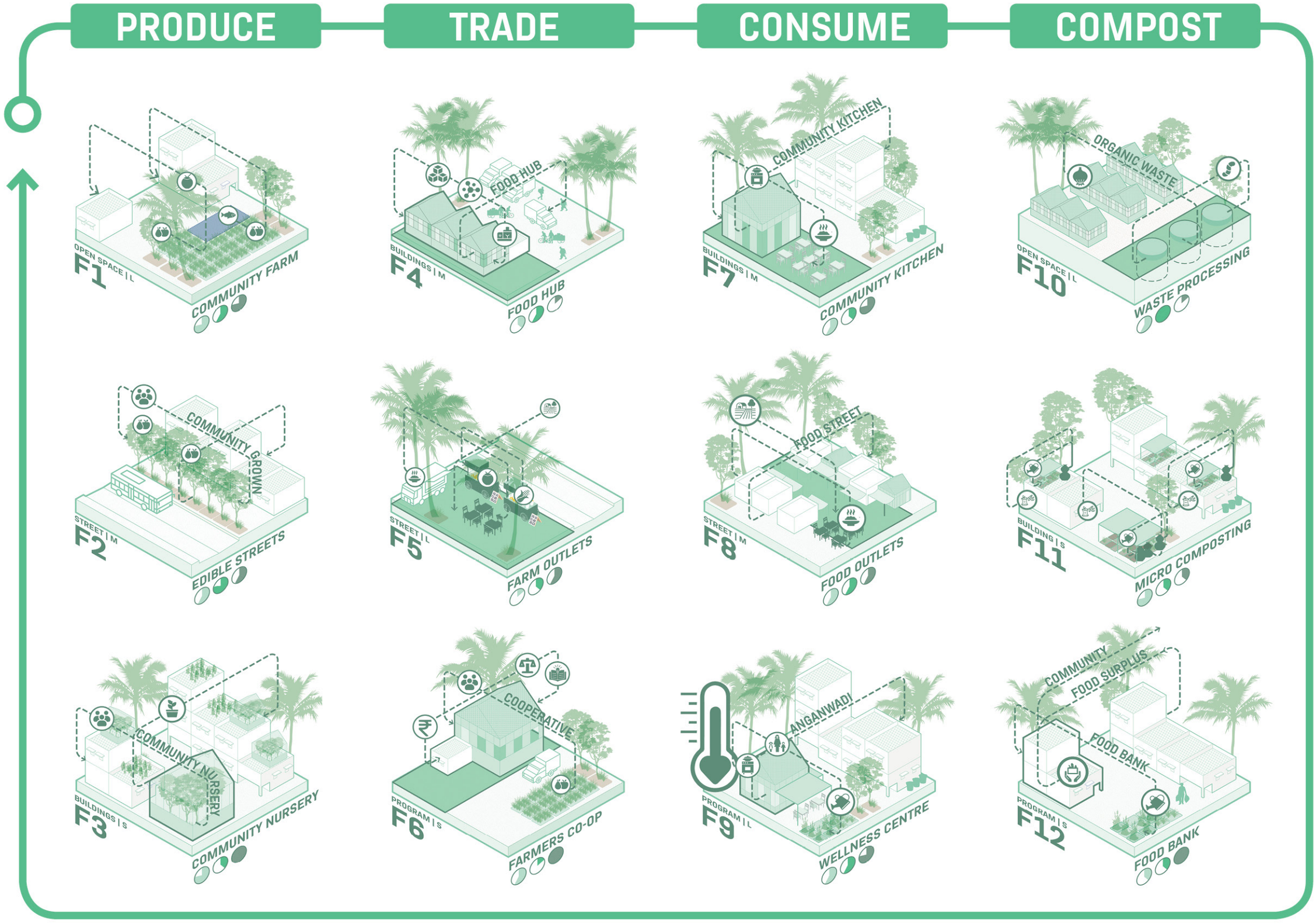


Fig 36: Tools for Food Loop

v. Energy Loop

Energy Loop articulates the actions of Generate - Distribute - Renew - Conserve. The primary focus areas here include maximising the use of renewals, ingraining efficiency, choosing right products, and integrating passive natural systems. The Energy Loop aims to bring energy as an integral part of urban spatial planning and design through strategic tools. The tools for the energy loop are structured to insert spatial and institutional attributes of energy systems within conventional urban thinking.

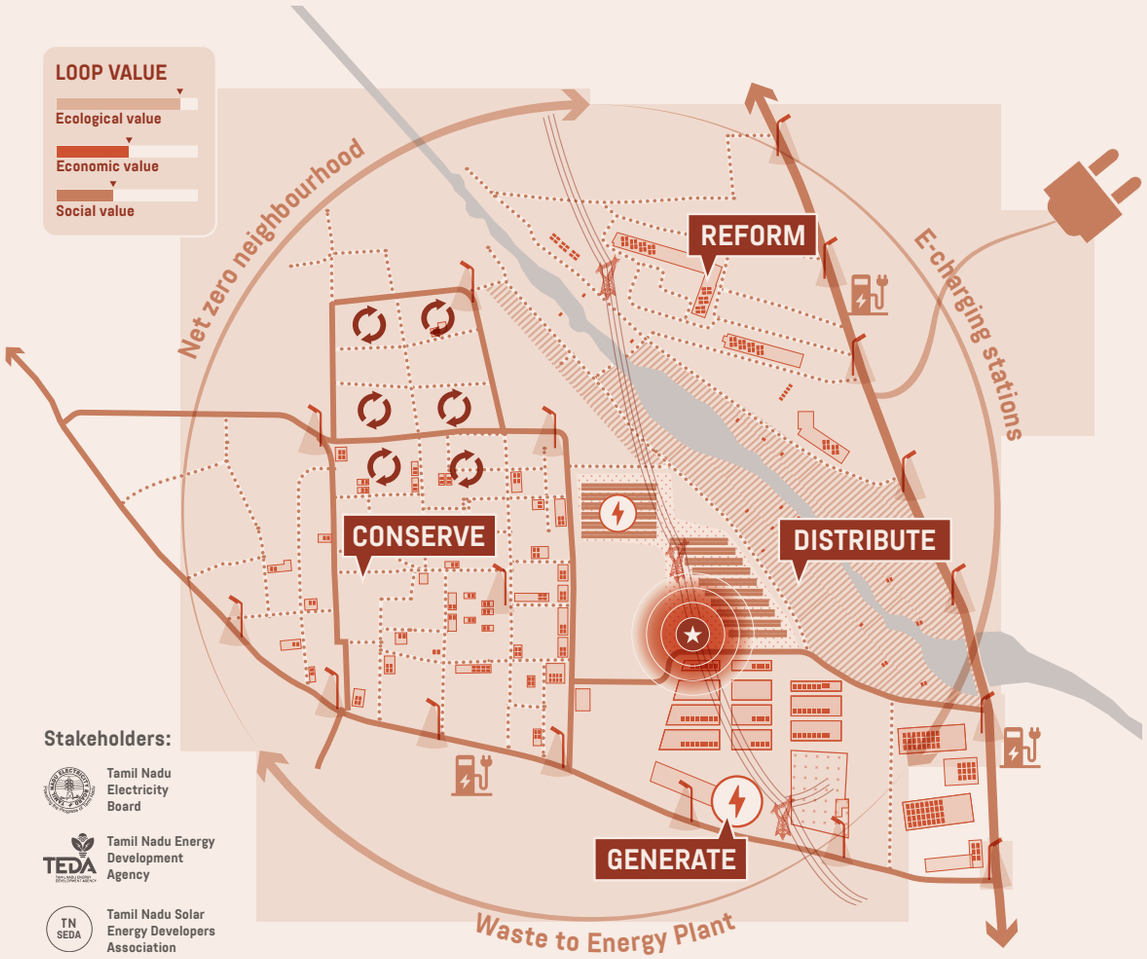
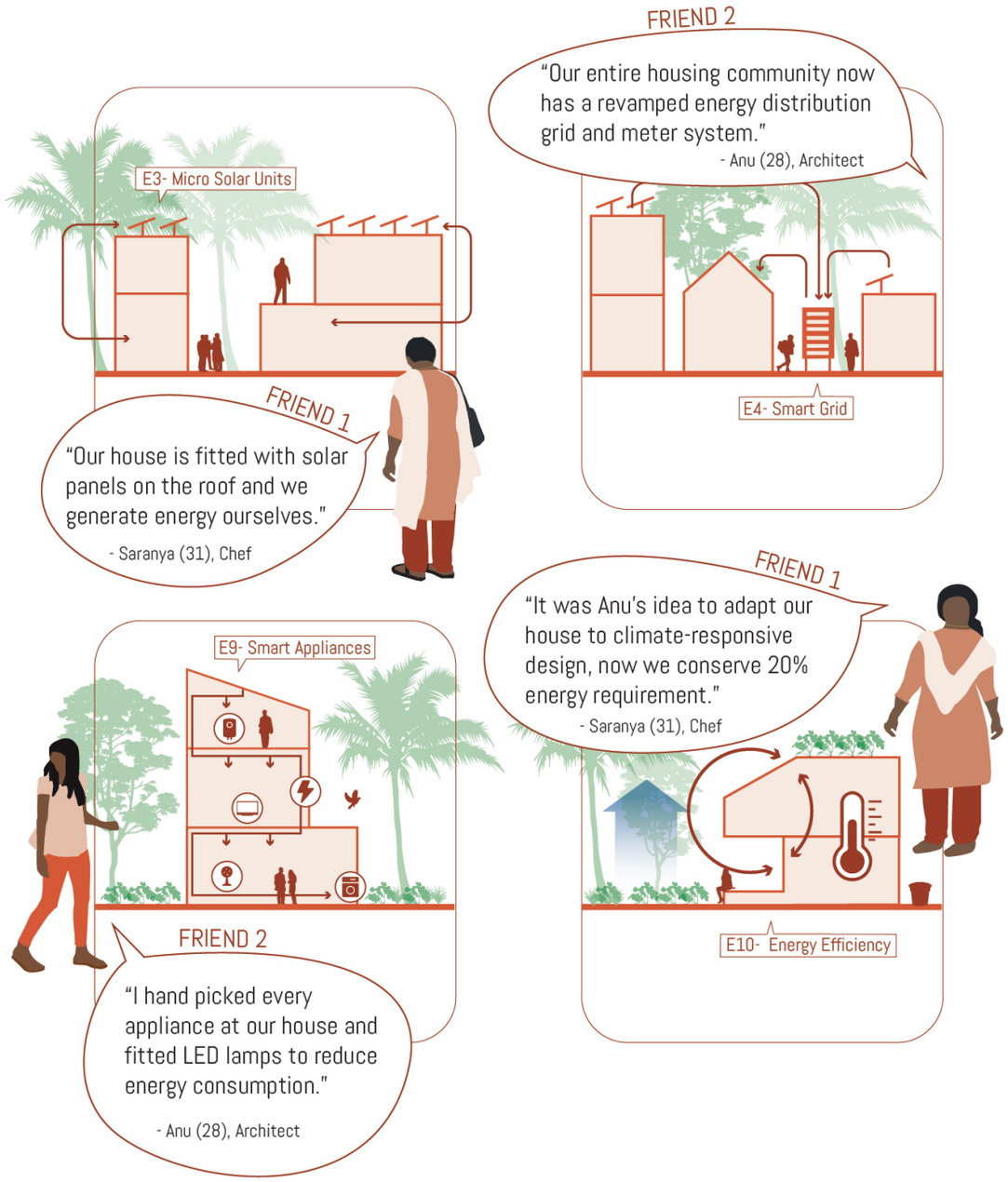


Fig 37: Scheme showing the spatial implementation of the tools from Energy loop and stakeholders involved



Generate. Distribute. Renew. Conserve

Fig 38: Storyboard showing how Energy Loop will have an impact on everyday lives

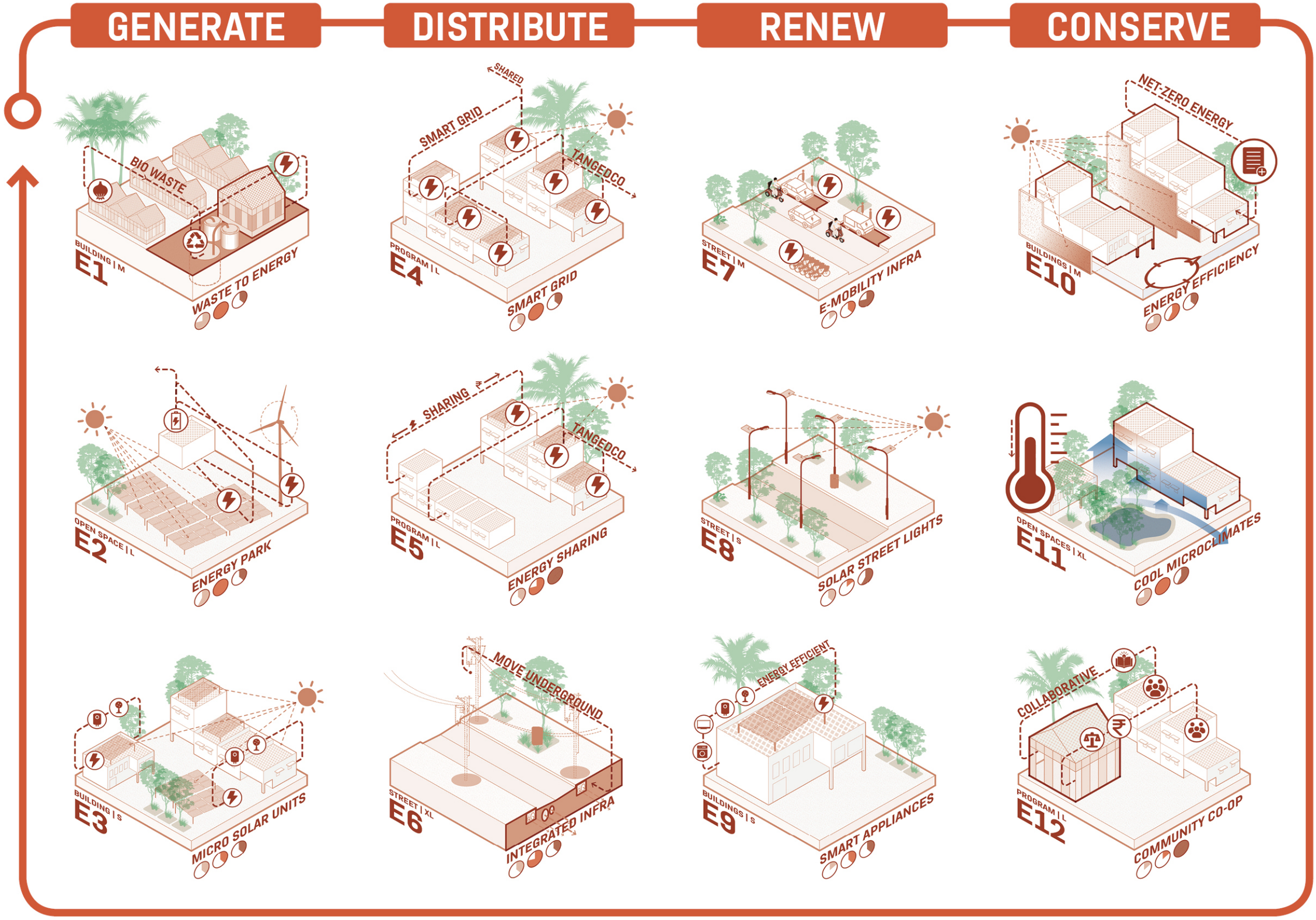


Fig 39: Tools for Energy Loop

vi. Spatial Framework

The four resource loops and the strategic actions were spatially mapped within the Koundampalayam ward to generate the framework plan. The overlaps, synergies between multiple resource loops can be seen in the framework plan, as well as the distinct identities of each of the subsites. This report will elaborate in detail on the concepts, frameworks, and strategies for the Dr MGR Market & the surrounding public domain (Subsite C).

Fig 40: Spatial framework for Koundampalayam

4 Circular Market

Fig 41. View of TNHB highrise apartments in subsite E. Source: GIZ India.

i. Glimpse into Subsite C

What is there now?

Subsite C was part of the waste dumping yard with an incineration plant for waste management operated by the corporation of Coimbatore until 2007. This site has direct connectivity with Mettupalayam Road. The recently cleared informal areas along Jeeva Nagar have given a new road edge to this subsite. The Coimbatore Corporation has proposed this area for relocation of Dr. MGR wholesale market, currently located less than 500m from the Koundampalayam Ward. The relocation of Dr. MGR Market is considered as the anchor for redeveloping Subsite C.

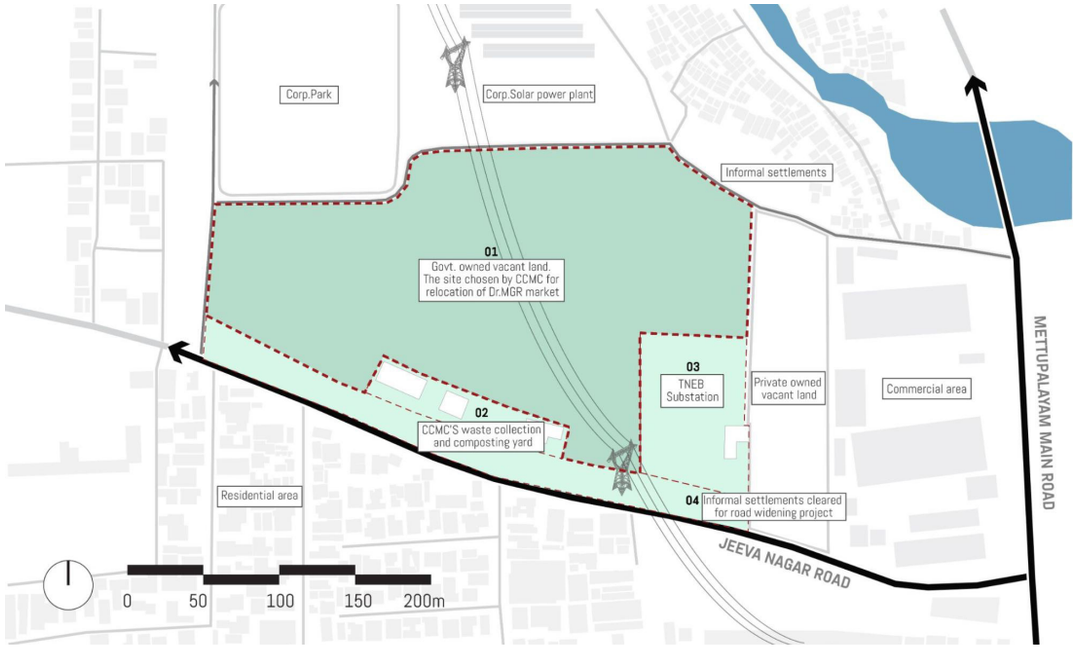
The site is accessible from the Mettupalayam Road and shares its boundary with a solar power plant and landfill park on its northwest and informal settlements on its north-east. The site is flanked by Jeeva Nagar road on its southern side which abuts a residential colony and shares its boundary with commercial establishments along Mettupalayam Road on its south-eastern edge. Existing structures in the closest proximity to the demarcated site area are the TNEB substation and waste collection and composting yards on the Jeeva Nagar road.

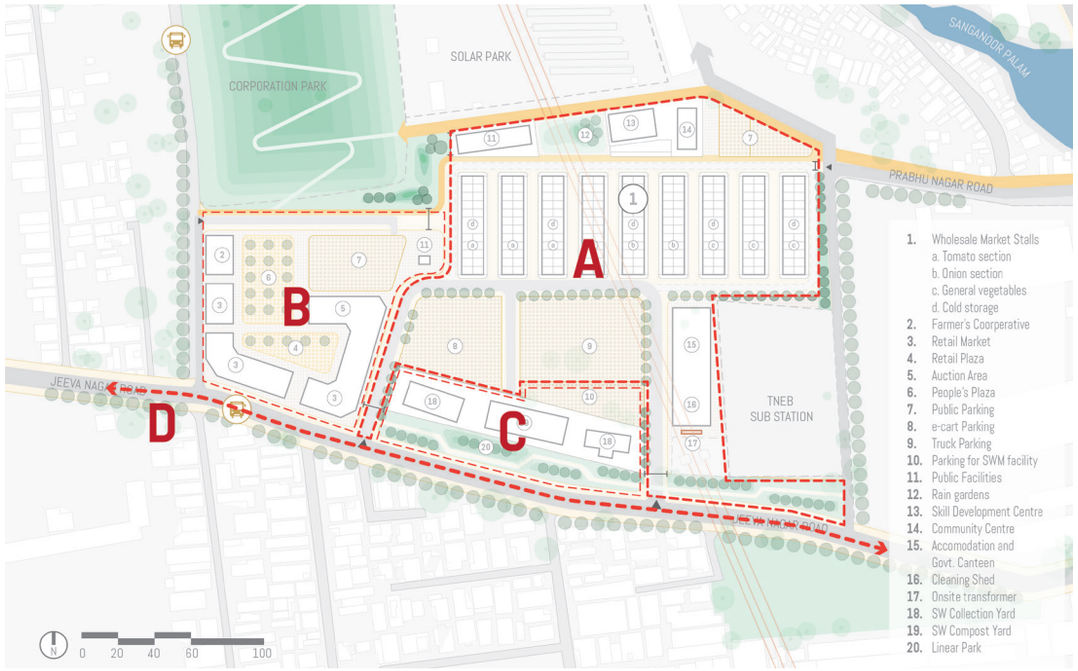
Subsite C has multiple components that require comprehensive planning. Due to the spatial and functional influence of the Market as a typology, the design strategy and thinking have been oriented by keeping the 'urban market' at the center. The site for relocating Dr MGR wholesale market is envisioned as a city-level TRADE node in the food network which also activates adjoining residential neighbourhoods. The whole Concept Master Plan area is identified to have four distinct, yet integrated design projects/components which are equally significant for the holistic impact and transformation. The four components are the Wholesale market section & Community open space, the Retail Market section, the Solid Waste Management center, and the Jeeva Nagar Street redevelopment.

Design requirements for the wholesale market:

(as recommended by stakeholders)

- Number of shops - 125
- Recommended size of each unit: 30 x 40 ft.
- Distance between opposite shops 80 to 100 ft to accommodate two-way movement of transportation vehicles
- Storage - Warehouses are not required but a common shed for cleaning is required (~ 0.5 acres)
- Three parallel lines or sectors for a) onion, b) tomatoes and c) other vegetables
- Two access roads to the market are preferred





A. Wholesale market and community facilities: Vendor units, public amenities, internal road network, landscape facilities
B. Retail Market: Retail zone and People's Plaza, parking.
C. Waste Management Unit: SWM centre and other amenities
D. Street Redevelopment: Complete Street, vibrant public spaces, multimodal integration with rest of the city

Fig 42: (above) Map showing the site boundary and landmarks around subsite C
Fig 43: (below) Illustration showing the potential design projects withing subsite C

Fig 44: View of TNEB substation near Subsite C. Souce: GIZ India

Fig 45: View of Subsite C from Jeevanagar road. Source: GIZ India

ii. Stakeholder mapping

The overall planning and design strategy are built on the Circular Covai vision that aims to embed circularity as a planning and design approach through optimizing the resource loops of people, water, food, and energy. The integration of these loops and their resource flows is what informs the key spatial decisions.

The successful implementation of these loops requires the involvement of and coordination amongst multiple stakeholders. Circular approaches, by their nature, are multi-sectoral and transcend sectoral boundaries. Hence, existing stakeholders within the project are identified and their specific roles are expanded.

Activity/Role & Stakeholders:
Within each of the loops, sector-specific stakeholders play an important role in the planning of functions. The Coimbatore municipal corporation is envisioned as the lead stakeholder, holding the different loops together.

Primary Stakeholders:

1. Coimbatore City Municipal Corporation: As the urban local body, CCMC's views play a major role in understanding the strengths of the market setup going forward, their preferences when it comes to the pilot project in the market site, along with the understanding of other specific needs like the parking management, waste management model, and other civic services.
2. Market Representatives: Market representatives such as the Vendors and Traders association form another key stakeholder who directly impact the design process.

Secondary Stakeholders:

1. Local NGOs/ CBOs
2. Residents in the Koundampalayam neighborhood
3. HMV drivers/ market laborers

Furthermore, capacity development of primary stakeholders like the CCMC, key governmental line agencies, citizen representatives, and the MGR market association would be key in using the toolbox for its apt implementation.

Loop	Activity/ Role	Stakeholder
People	Planning & Approval	Coimbatore Municipal Corporation, Local Planning Authority, Coimbatore Smart Cities Limited, MGR Market Vegetable Traders Association
	Enforcement and Maintenance	Coimbatore Municipal Corporation, MGR Market Vegetable Traders Association, Coimbatore Traffic Police
Water	Planning	Tamil Nadu Water Supply and Drainage Board, Coimbatore Municipal Corporation, Coimbatore Smart Cities Limited
	Enforcement and Maintenance	Coimbatore Municipal Corporation, Tamil Nadu Water Supply and Drainage Board
Food	Planning	Tamil Nadu Horticulture Department, Tamil Nadu Agriculture Department, Tamil Nadu Agricultural University, MGR Market Vegetable Traders Association, Coimbatore Municipal Corporation
	Enforcement and Maintenance	MGR Market Vegetable Traders Association, Coimbatore Municipal Corporation, A locally identified CSO or NGO
Energy	Planning	Tamil Nadu Electricity Board (TNEB), Tamil Nadu Energy Development Agency (TEDA), Tamil Nadu Energy Developers Association (TNSEDA), Coimbatore Municipal Corporation
	Enforcement and Maintenance	Coimbatore Municipal Corporation, Tamil Nadu Electricity Board (TNEB)

Loop	Program / Interventions	Beneficiaries
People	Worker's Accommodation	Workers and Long-distance truck drivers.
	Community Centre	Residents from the adjacent neighborhoods and Vendors
	Retail Market	Residents from the adjacent neighborhoods, Small entrepreneurs, and a secondary revenue source for the corporation.
	Skill Development Centre	Women and other vulnerable middle-aged workers in the adjacent neighborhoods.
Water	Rooftop Rain Harvesting facilities	Indirect benefit for residents in adjacent neighborhoods and direct benefit for vendors of the MGR Market.
	Bio-Toilets	Vendors, workers, and market users.
Food	Nurseries	Residents from the adjacent neighborhoods
	Cold Storage Unit	Vendors in the MGR wholesale market.
	Cloud Kitchen	Small and medium-sized food entrepreneurs and a secondary revenue source for the corporation.
	Government Canteen	Predominantly workers, drivers, and other laborers within the market.
Energy	Rooftop Solar Panels	The secondary revenue source for the corporation.
	E-Vehicles Charging area	Food delivery professionals and internal e-truck drivers.

Fig 46: Tables outlining the stakeholders, programmes and beneficiaries per loop

iii. Potentials for People Loop

In the context of an urban market, the People Loop could be associated with the action layer 'Work'. Vendor Zone(P8) will be an integral part of the market area. The new commercial development could also catalyze Mixed-Use(P7) growth in the neighborhood. These tools shall facilitate improved economic productivity and offer new employment opportunities within and outside the Market precinct. In addition, it will also ensure 'Eyes-on-the-Neighbourhood' with activities bustling in the Market at all times of the day.

Opportunities for 'circular market' paradigm:

1. **Live -** Community forums(P3) could accommodate a temporary retail market/vendor zone(P8) to ensure citizens have access to basic services within 10-minute walking distance.
2. **Move** - Multi-modal Node(P6) becomes crucial to ensure accessibility through public transport and non-motorized modes and attract significant footfall to the Market from different parts of the city.
3. **Engage -** The essence of the market as a 'public space for all' could be strengthened by spatially anchoring it as a Cultural Node(P10) for people from diverse backgrounds.

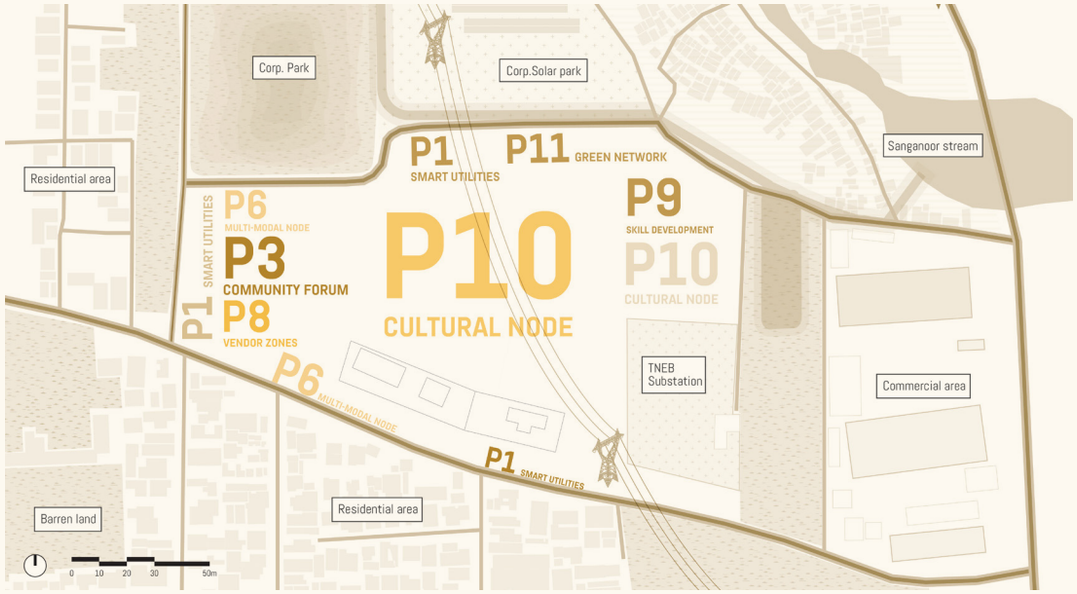


Fig 47: Scheme showing the spatial potentials for people loop

Potentials for Water Loop

In the context of an urban market, the Water Loop could be associated with the action layers 'Collect & Treat'. As a 12-acre site area, the open spaces within the Market complex could be multi-functional as a local Water Reserve(W1) to collect stormwater runoff during cloudburst events. The roofed areas of the Market are opportunities to deploy Rainwater Harvesting(W3). For everyday activities, the market complex will require water in large quantities. In order to reduce stress on groundwater resources and optimize consumption, micro Water Treatment(W6) could also be included. Employment of these tools will ensure efficient consumption and management of water.

1. **Release -** The site location being close to the Sanganoor Canal, the treated water and stormwater runoff could be released through Stormwater channels and pipes(W7).
2. **Release -** The open-source topographic data reveals that the site has a small depression towards the South. Through strategic spatial zoning and grading, opportunities for Aquifer Recharge(W9) could be explored.
3. **Restore -** The eastern peripheral zone of the Market could be developed into a dense vegetation zone through Urban Forestry(W11) techniques.

Opportunities for 'circular market' paradigm:

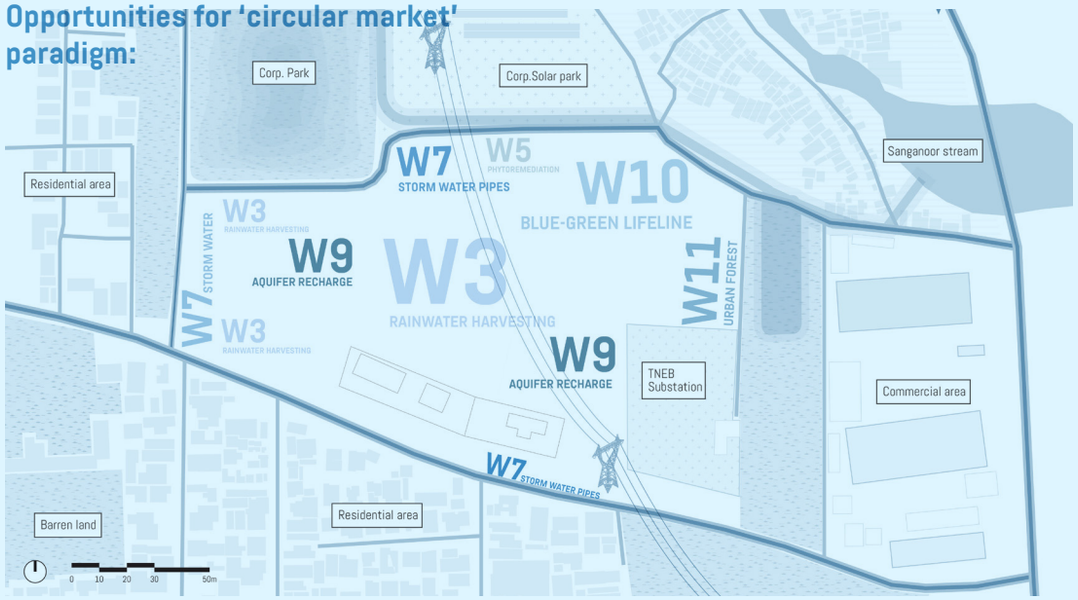


Fig 48: Scheme showing the spatial potentials for water loop

Potentials for Food Loop

In the context of an urban market, the Food Loop could be associated with the action layers 'Trade & Compost'. Farm produce from varied parts of the city and region shall be traded in Food Hub(F4). The Farmer's Cooperative(F6) could play as a nodal agency to manage the welfare of farmers and also facilitate seamless trade activities. Waste Processing(F10) and Micro Composting(F11) could be integrated within the Market precinct to encourage localized waste management and reduce stress on centralized landfills. Programmatically linking the Food Bank(F12) with the Market could help people reduce food waste and distribute the excess to the needy. In this context, the Urban Market proposal is an asset to explore the Food Loop at its maximum potential.

Opportunities for 'circular market' paradigm:

1. **Produce** - Community Nursery(F3) could be integrated with the market area and in relation to the public park.
2. **Consume** - The diverse day-to-day users of the Market in most cases are laborers who have come from different towns and villages for trading activities. Access to healthy and affordable food is a basic necessity for them. Food Outlets(F8) become an essential component for the healthy routine of the Market.

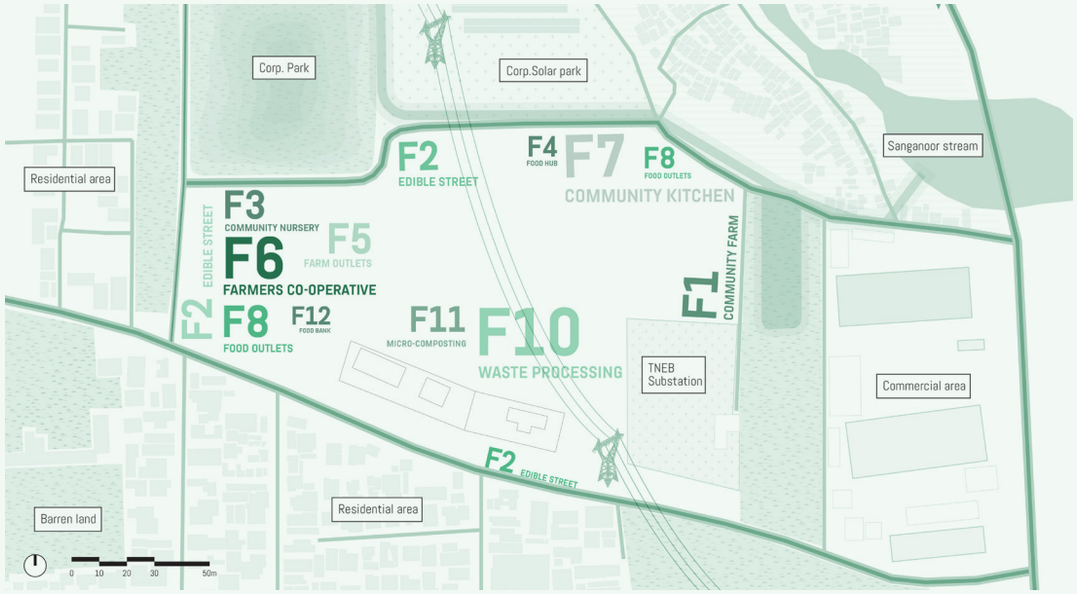


Fig 49: Scheme showing the spatial potentials for food loop

Potentials for Energy Loop

In the context of an urban market, the Energy Loop could be associated with the action layers 'Generate & Conserve'. Adding Micro Solar Units(E3) to the Market structures could support energy generation. The Market Complex could also be planned and designed in response to local climatic conditions and by employing low-cost, low-carbon materials in order to achieve optimum Microclimate(E11) within the precinct. Reducing paved areas, increasing green cover, and enabling air circulation are other passive strategies that could support it. Overall, by integrating the tools from the energy loop the Market precinct could take an active step forward to become a Net-Zero Green campus.

Opportunities for 'circular market' paradigm:

1. **Distribute** - Since the Market proposal is a greenfield project, it offers immense opportunity to plan and design Integrated Infrastructural(E6) provisions both underground and aboveground effectively.
2. **Renew** - Aligning to the long-term vision for shifting to e-mobility, the parking lots in the Market precinct could be provided with necessary E-mobility Infra(E7).
3. **Renew** - In addition to fixing Micro Solar Unit(E3), careful choice and utilization of Solar Street Lights(E8) and Smart Appliances(E9) could support in reducing energy load.

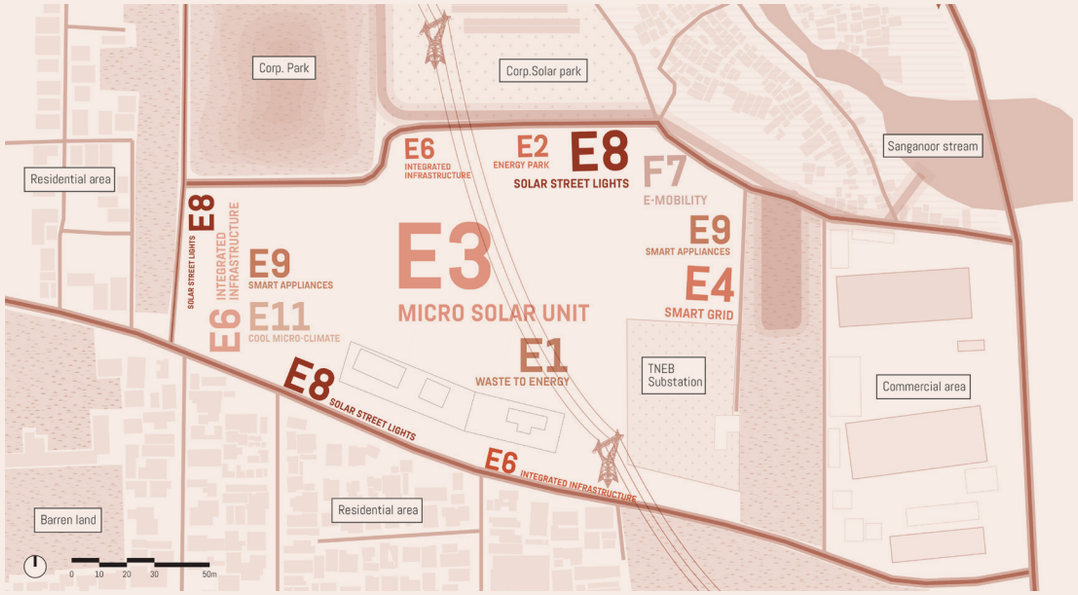


Fig 50: Scheme showing the spatial potentials for energy loop

iv. Circular Market Layout

The site for relocating Dr. MGR wholesale market is envisaged as a city-level TRADE node in the food network which also activates adjoining residential neighborhoods through people's plaza, street market, solid waste management (SWM) unit along Jeeva Nagar Road, and the community facilities for the informal settlements along the North-Eastern edge.

The market area has a People's plaza and retail market, wholesale market section, and community edge. People's plaza shares active and porous edges for people to MOVE and ENGAGE. The parking space and the cleaning shed are clustered with the SWM unit for functional efficiency. The central court in the retail block is part of the blue-green network which acts as a public space, hosting temporal activities.

Recommendations:

1. The proposed market has 4 major zones that includes the retail market zone, the wholesale market zone, waste management zone and the community edge.
2. The Jeeva nagar road serves as the primary access network to the site. The access leading to people's plaza is flanked by the retail market, farmers cooperative and auction area. This access allows for safe and active movement of pedestrians free of vehicles.
3. The centralize parking area for the heavy trucks and e-cart allows for a decongested movement of goods and vendors/buyers in the wholesale market area.
4. The wholesale market is divided in 3 sections with 3 columns of 24 market stalls each. Together there are 228 market stalls with an auction area outside the wholesale market zone.
5. The community edge serves as the blue-green landscape network that fosters soft landscapes, water gardens, open plazas, and neighborhood facilities.
6. To provide spaces for the workers to rest and eat, the eastern patch of the site is articulated with accommodation, a cleaning shed, and a community kitchen.

The proposed wholesale market in Koundampalayam has very specific opportunities and challenges in how the circularity tools could be implemented. The identified tools from the circularity toolbox are expanded into specific circularity guidelines for the wholesale market along with the four loops of people, water, food, and energy.

Fig 51: View of proposed Market area

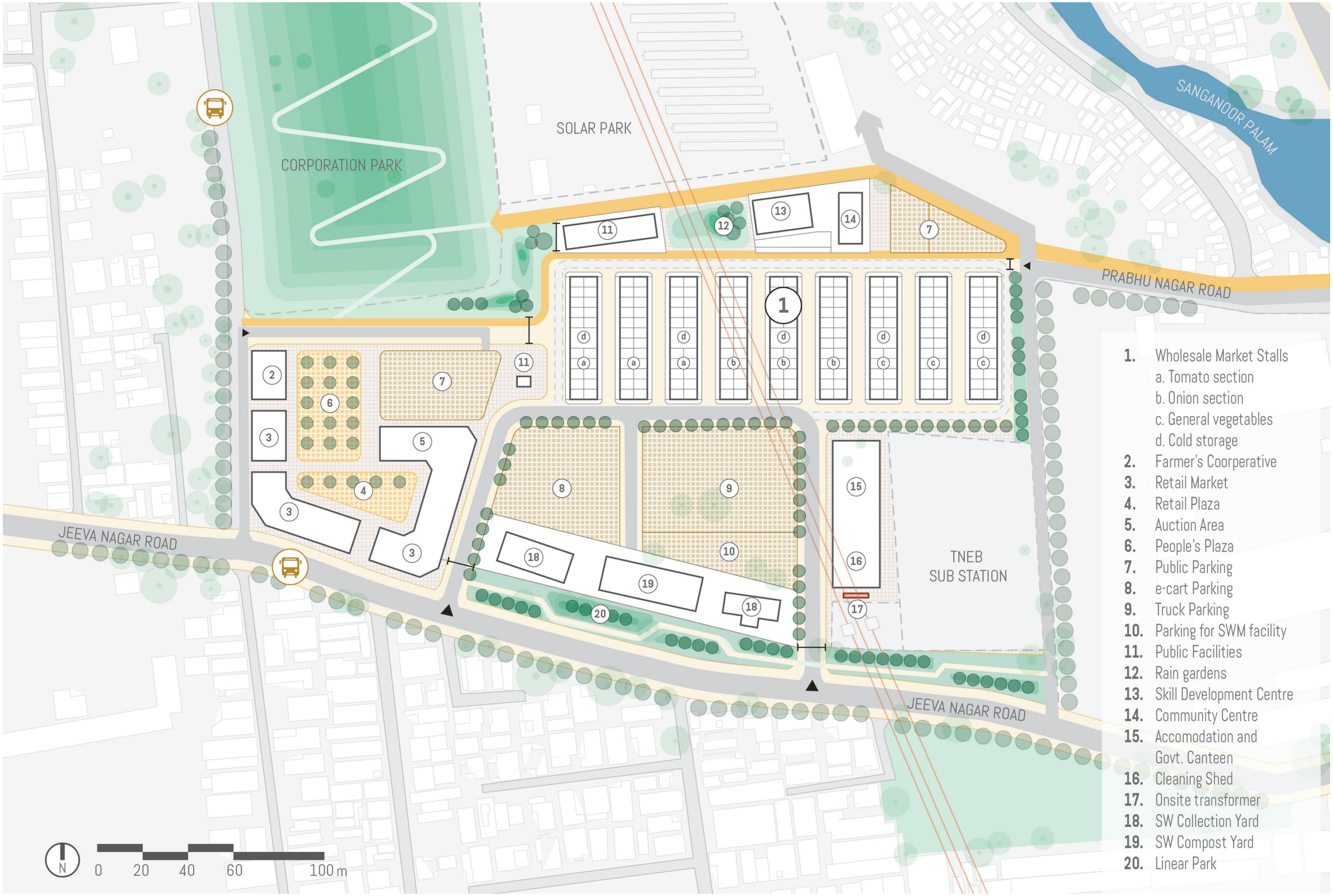


Fig 52: Layout for Subsite C

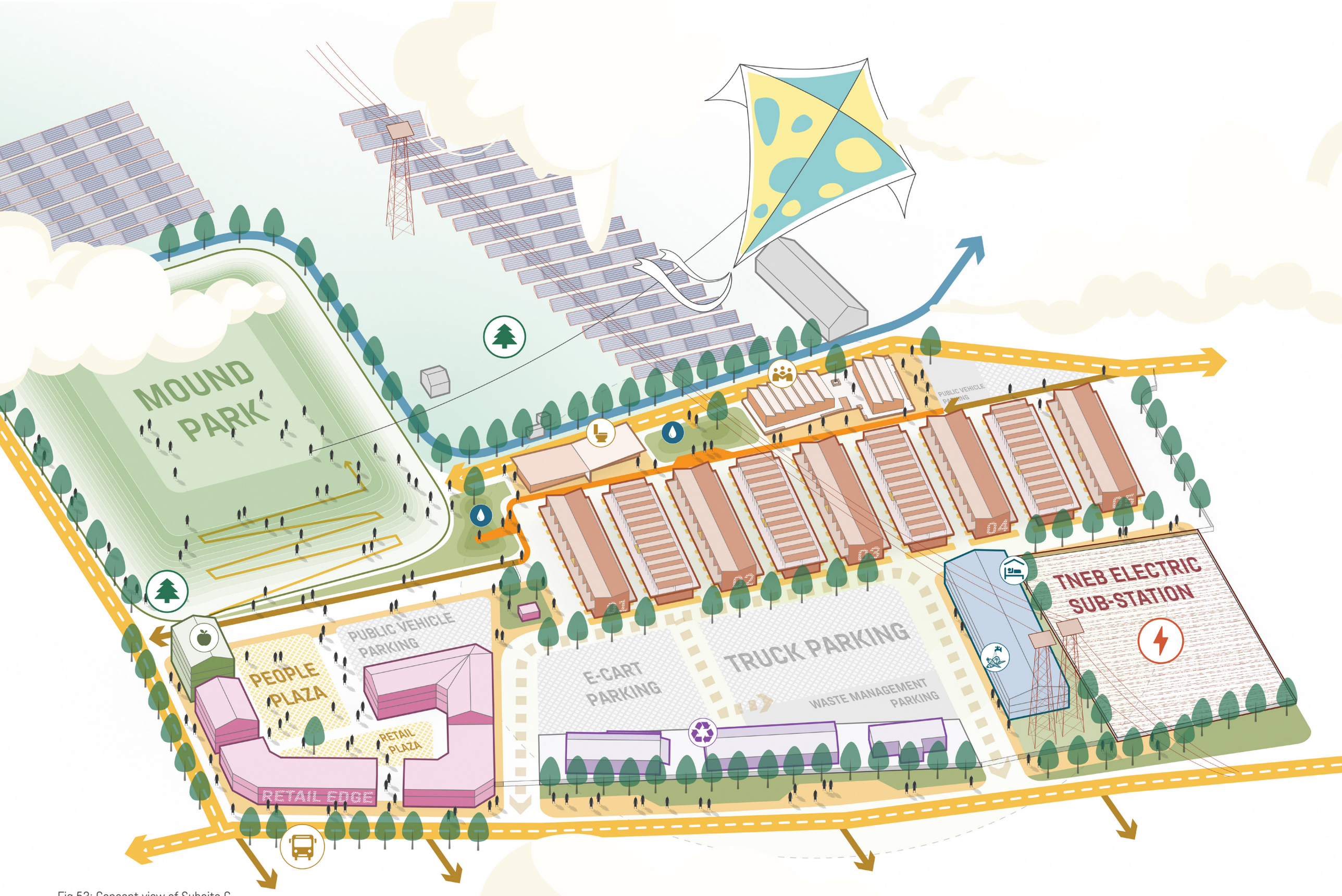


Fig 53: Concept view of Subsite C

Fig 54: Concept view of the proposed community edge

v. Mobility & Open Space Network People Loop

In the people loop, the focus is on expanding available amenities within the premises of the wholesale market that can serve both the market users and the people in the neighborhood, establishing a strong overlap in how the market is used, thus integrating it within the urban fabric, programmatically. The below illustration lists the tools that will be included from the People Loop as part of the wholesale market design, as the specific design components/guidelines.

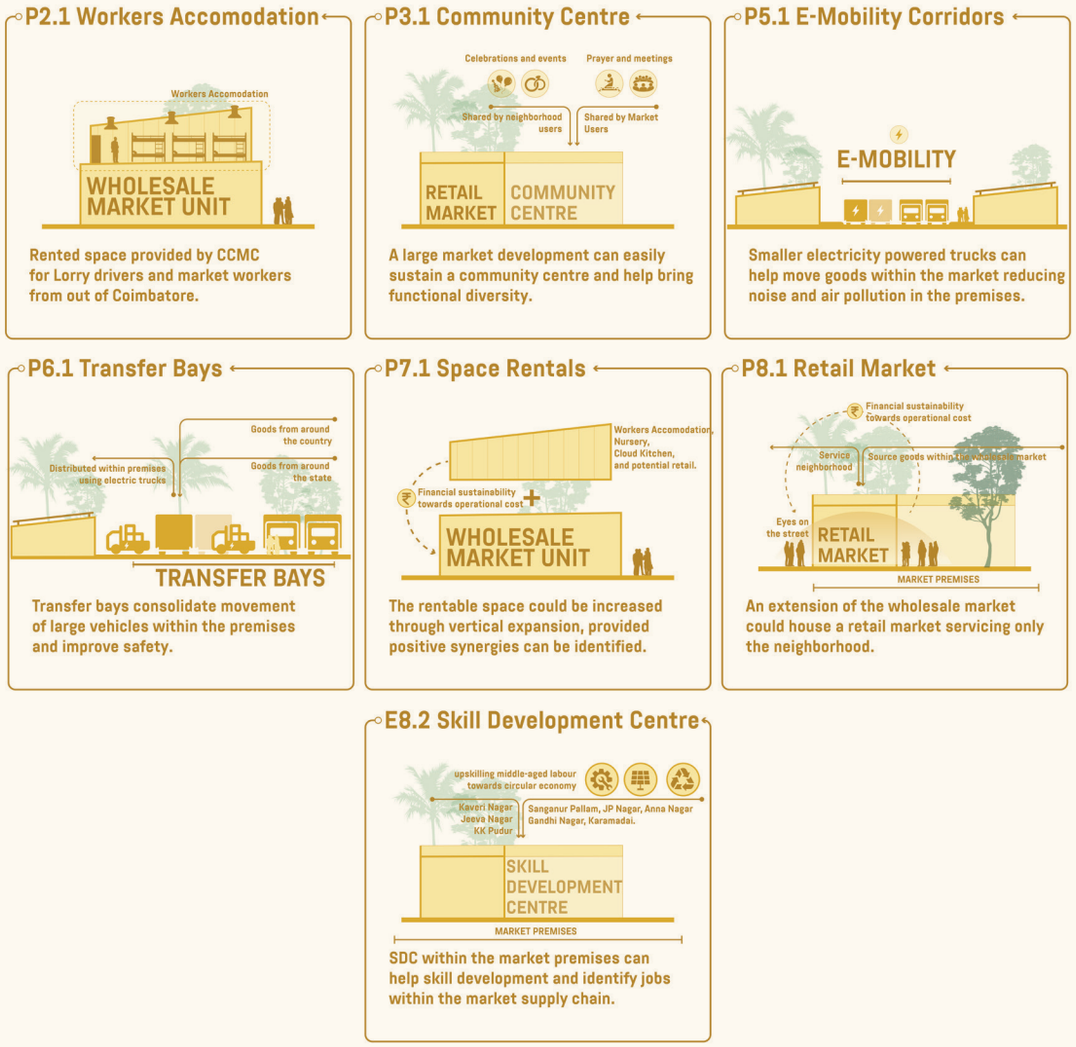


Fig 55: Tools for mobility and open space planning in the market

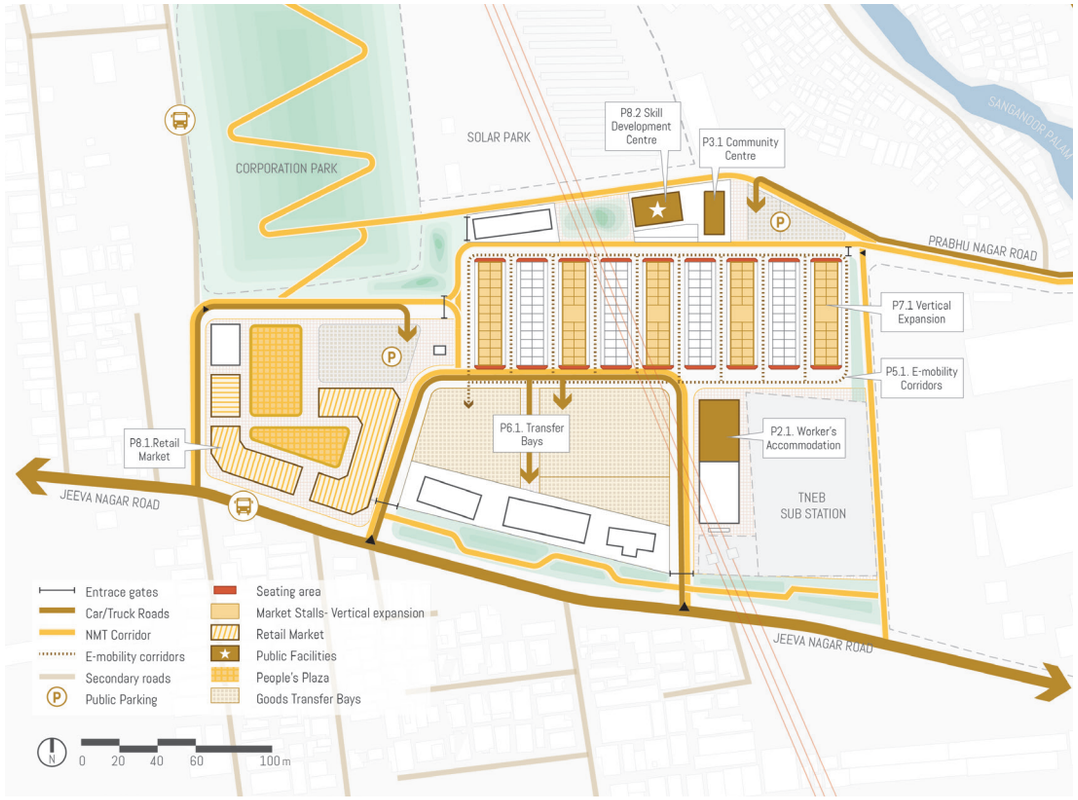


Fig 56: Map showing the mobility and open space strategies for the market

Recommendations:

1. The layout has clear accessibility routes for ease of movement and porosity to the site. It has two entry/ exit for vehicles and multiple entry/ exit for pedestrian movement. The non-motorized corridor near the informal settlements allows people to move freely.

2. The transfer bays are designed in a way to minimize the movement of heavy-motorized vehicles and decentralize the movement of goods within the wholesale market via e-carts.

3. The people's place enclosed by a retail market, auction area, and farmers cooperative acts as an active flexible space for congregation, providing a platform for open discussions and temporary exhibitions.

4. The open pockets along the community and skill development center cater largely to the informal settlements to hold discussions, vendor spaces, and gatherings.

5. The open space along the Jeeva nagar road acts as a passive recreational seating area for the neighborhood people and the landscape acts as a visual buffer to the waste management area.

vi. Water Management, Biodiversity Water Loop

In the water loop, the specificities of how the strategies of collect, treat, release and restore would be implemented within and around the market premises are expanded.

The below illustration lists the tools that will be included from the Water Loop as part of the wholesale market design, as the specific design components/guidelines.

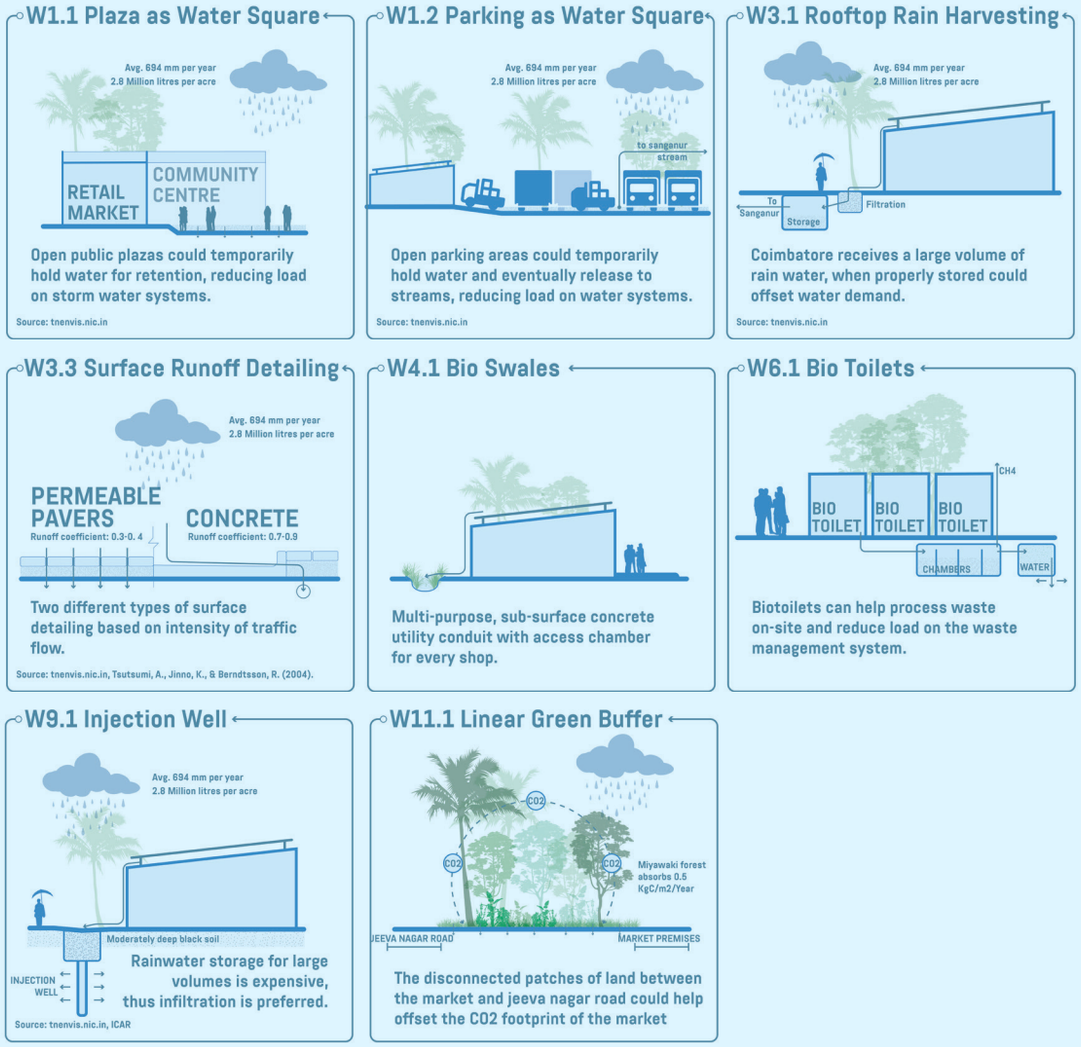


Fig 55: Tools for water management and planning in the market

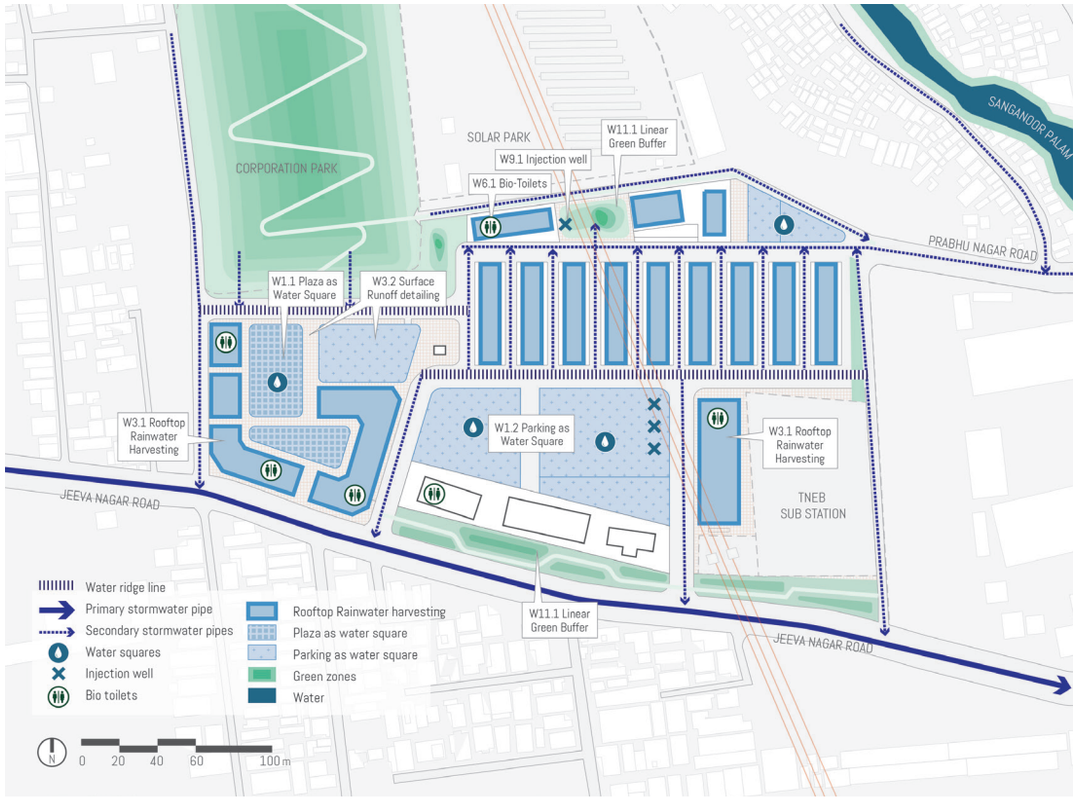


Fig 57: Map showing the water management and biodiversity strategies for the market

Recommendations:

1. To prevent water clogging and allow groundwater recharge, the market consists of strategically articulated open pockets and conscious use of permeable paving materials.

2. To reduce the load on underground stormwater drains the open plazas hold and allow for slow retention of water. The north patch of the market acts as a blue-green landscape network that fosters vegetation, rain gardens and enhances the micro-biodiversity of the neighborhood.

3. To optimize storage of rainwater and reduce stormwater run-off the buildings in the market are proposed with rain water harvesting systems.

4. The landscape patch between the Jeeva nagar road and waste management site is designed as a linear green buffer.

vii. Vendor and Waste management Food Loop

In the food loop, the specificities of how the strategies of produce, trade, consume, and compost would be implemented within and around the market premises are expanded. For some tools such as F3: Community Nursery, there are multiple possibilities in how they could be executed, and thus they are elaborated separately. Some of these guidelines, such as government canteens and food banks, look at optimizing existing schemes by locating them within the premises of the wholesale market owing to the potential synergistic effects that could be achieved by their proximity.

The below illustration lists the tools that will be included from the Food Loop as part of the wholesale market design, as the specific design components/guidelines.

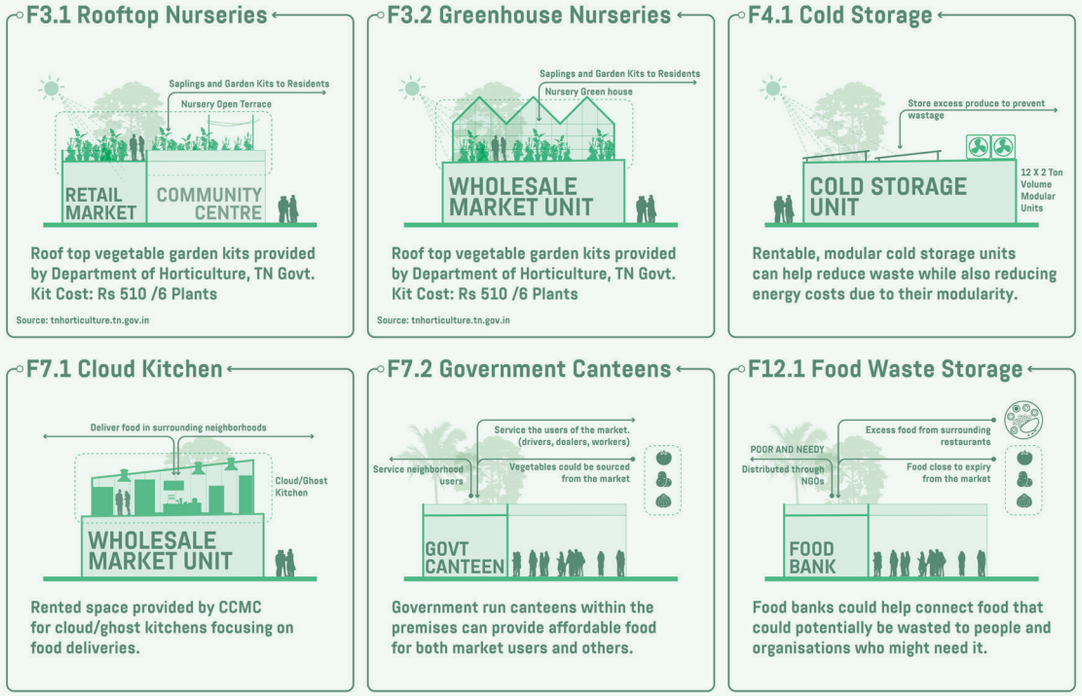


Fig 58: Tools for vendor and waste planning in the market

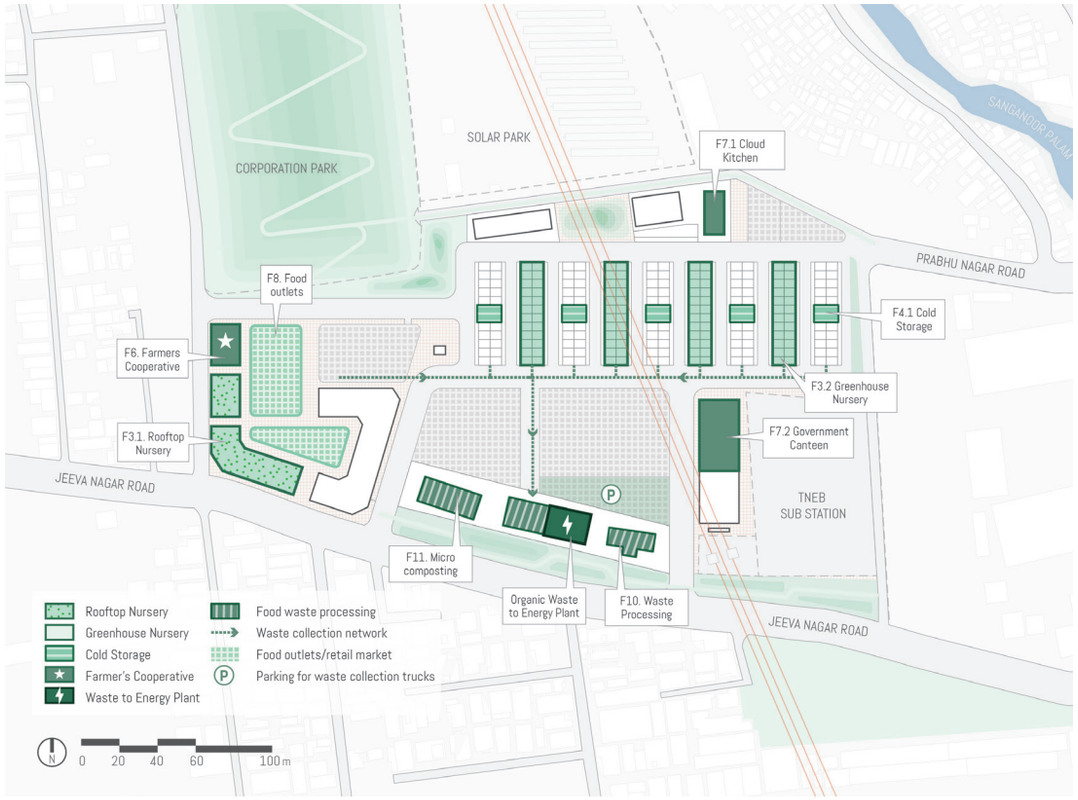


Fig 59: Map showing the vendor and waste management strategies for the market

Recommendations:

1. To provide ease of navigation in the wholesale market the vendors are largely zoned within the nine columns of 24 stalls each. The vehicular traffic around the stalls is provided only to the e-carts for loading and unloading of goods.

2. The prices and distribution of goods is regulated by the members of the market committee housed in the auction area, strategically positioned outside the wholesale market area section.

3. The transer bay integrates the existing waste management buildings and to avoid congestion a separate circulation is provided for the movement and parking of waste collection trucks.

4. The food loop allows the food to be grown, stored, sold, consumed and decomposed in an efficient and sustainable way. The rooftops of retail markets, farmers cooperative and wholesale market stalls are designed as rooftop nurseries.

5. The waste collected from the market is decomposed within the site in the waste management area to produce organic fertilizers. The Waste-to-Energy plant has been proposed as a potential value add to the system.

viii. Energy production and use

Energy Loop

In the energy loop, the specificities of how the strategies of generate, distribute, renew, and conserve would be implemented within and around the market premises are expanded. The below illustration lists the tools that will be included from the Energy Loop as part of the wholesale market design, and the specific design components/guidelines.

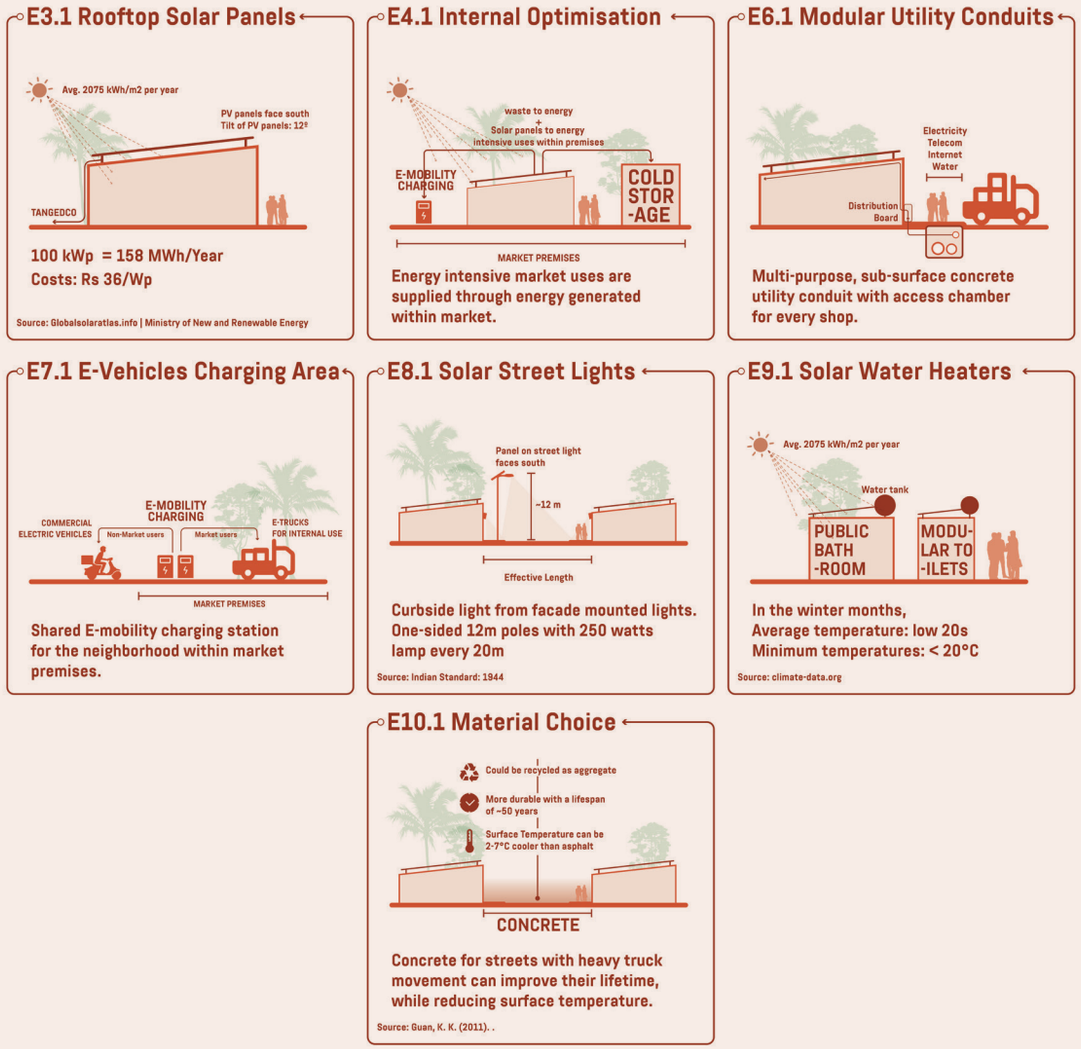


Fig 60: Tools for energy production and use in the market

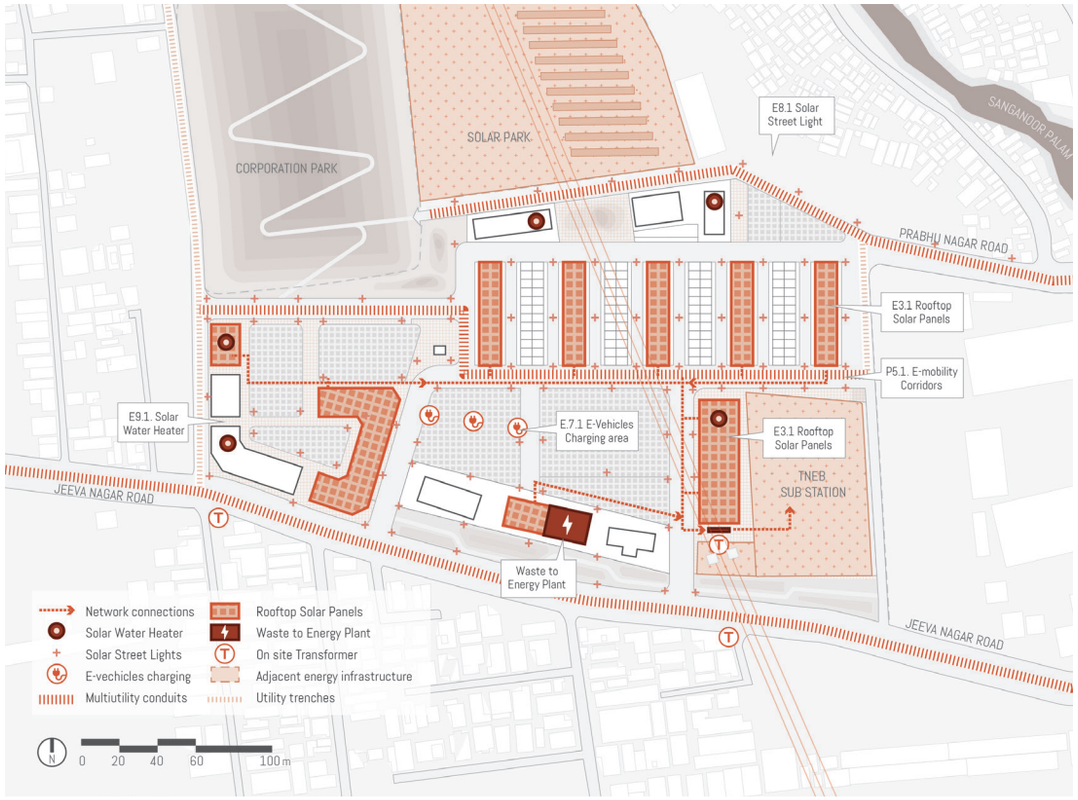


Fig 61: Map showing the energy production and use strategies for the market

Recommendations:

1. The building roofs are optimized with micro-solar panels that generate electricity for running the market and any excess production could be given back to the grid.

2. The solar energy is additionally harnessed in the form of solar lights and solar water heaters on building rooftops that reduces the reliance on non-renewable sources of energy.

3. The waste collected from the market and neighborhood is utilized to generate electricity and bio-fuel for the market. This way the waste is not only decomposed in a sustainable way but also provides monetary benefits on the longer run.

4. The CO2 footprint of the heavy vehicles is reduced within the market by opting for decentralized e-cart mode of goods transportation.

Fig 62: Scheme overlaying the strategies from the four loops of the market

ix. Strategic Interventions

People's Plaza:

The citizen-friendly plaza along with the retail market engenders people to MOVE and ENGAGE. The proposal interconnects the Jeeva Nagar Road, the adjacent neighbourhood street, the mound/ Corporation park and the market. The edge also will serve as a multi-modal node with a proposed bus stop, e-mobility facilities, and auto stand. The plaza along the Jeeva Nagar Road supports vendors for active trade. The central court is part of the blue-green network which acts as a public space, hosting temporal activities like weekend farmers markets. The precinct encompasses a farmers co-operative that is community-led and managed. The co-operative has a community nursery and food bank that encourages its members to create micro food loops.

Vendor section:

The wholesale market area has three sections that are designed with micro solar units in the roofs that collect rainwater as a means to GENERATE and COLLECT. The designated unloading areas and pedestrian lanes allow for a decongested and efficient circulation through the wholesale market area. The waste collection and management is intended to become circular by composting and thus supporting growing local food. Vibrant pathways with inclusive wayfinding elements support people movement. The vendor units are adaptable with a permanent plinth. The proposal will attempt to decongest vehicular movement, improve neighbourhood-level safety, attract economic activities, and facilitate a healthy market.

Community Market edge:

The interactive community market edge responds to the informal settlements with a community plaza, vendor zones, community center and workshop, and public toilets for the local residents as a means to WORK and ENGAGE. The community centre fosters entrepreneurship for women living in the informal settlement by proposing collaborative workshop areas and learning spaces. During the weekend the centre can host training sessions for farmers and traders. The low-emission street adjacent to the edge creates an active connection for the informal settlement. The market edge consists of an active plinth that supports vendors. The small adaptable plaza has a cycle parking facility, recreation space for children, and hosts community meetings and events at the weekend.

Fig 63: (top to bottom) Views of the people's place, vendor section and the community market edge

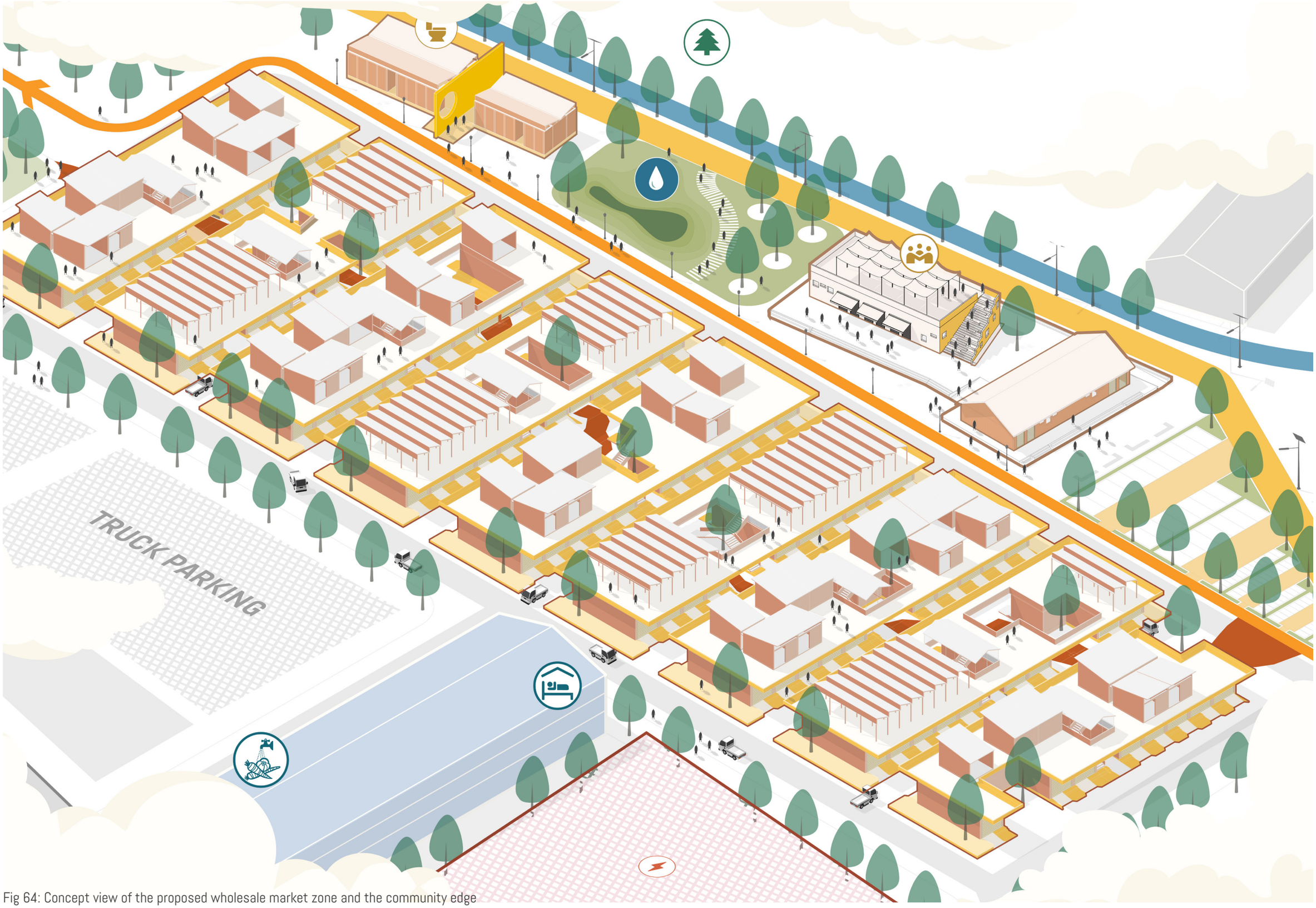


Fig 64: Concept view of the proposed wholesale market zone and the community edge

Fig 65: Concept view of the wholesale market

x. Stakeholder engagement

The project by vision is set to have participatory principles at the heart of it. But, the ongoing Covid-19 pandemic posed severe limitations in our process for site survey and stakeholder engagement. As a team of collaborators working from different parts of the globe, our planning, and design decisions was guided by the data collection and stakeholder engagement activities organized by partners of Covai UDC; including TARU and GIZ.

The table (right) lists the range of data and means made available during the process of this work.

Though the project was carried out under severe challenges, this indeed was a great learning experience for our team in tackling such situational hurdles and experimenting with ways to listen to the voices of stakeholders.

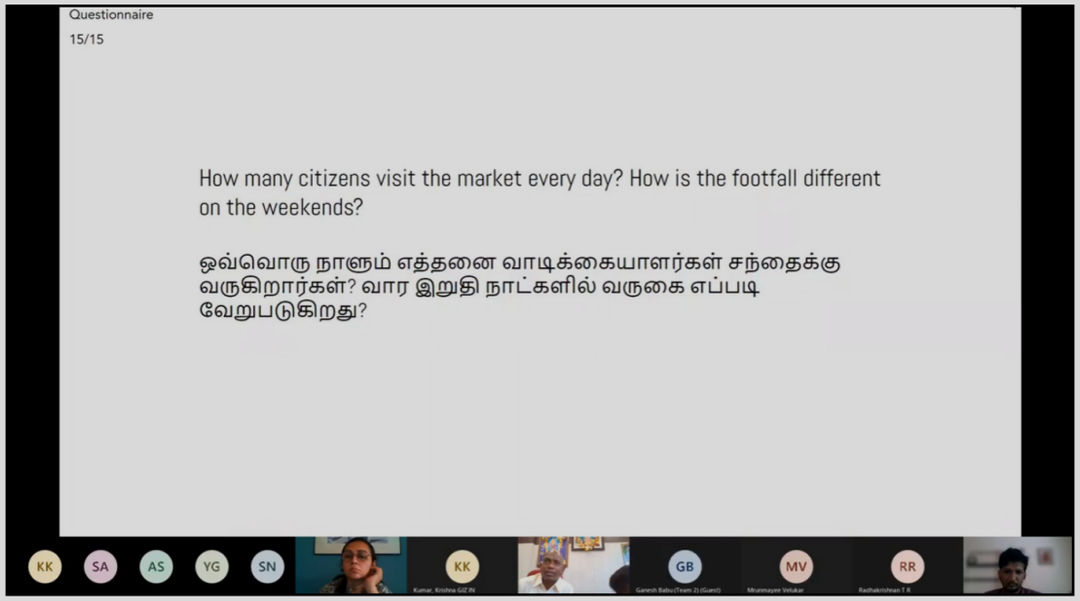


Fig 66: Online stakeholder engagements and consultations

Sl.No.	Survey data	Remarks
01.	**On-ground Topographical survey**: A detailed topographic survey including the contour, spot elevation, and mapping of all existing utilities was done. It also included roads and other built components within the site area. Trees that fall within the site boundaries were also included.	While the survey drawing presented all on-site features, the absence of access to revenue layouts poses the risk of misinterpretation of the site boundary and right of way.
02.	**On-ground visual documentation of site**: The entire site area was well covered through photos and videos by the Taru team.	While there are no gaps in the visual documentation process, there is room for some on-ground details that could have been missed.
03.	**Citizen survey**: The TARU team facilitated conducting citizen surveys on the ground to understand their perception, capture their needs and demands, and also introduce them to the project details.	While the survey process in principle tried to capture the voices of diverse user groups with gender, age, ability, and economic status, due to COVID-19 protocol a satisfactory sample size was not achieved.
04.	**Stakeholder discussion**: One-on-one discussions with the following stakeholders were done a. Mr. Kumar, TNSCB b. Mr. Sakthivel, EE, TNHB c. Mr. Uthaman, AE, CCMC d. Mr. Selvam (Representative from Market Association) e. Mr. Pathra Kumar, AE, TNSTC	The one-on-one discussions with the representatives from various agencies at the beginning of the process helped in clarifying multiple queries and developing the baseline requirements effectively. Nevertheless, considering this vision and the project objectives call for a cross-sectoral approach, an interdepartmental consultation session would have been a valuable addition.
05.	**Secondary resources**: In addition to the above-listed means, multiple other reports, maps, and publications were used as secondary sources to collect information, including: a. UDC Competition brief b. Data and layout of local city buses and routes c. Coimbatore CMP d. Land Use Plan - Coimbatore e. City Profile Report f. Strengthening Coimbatore City Plans g. Reports on existing and propose UGD	While the secondary sources were helpful to fill multiple gaps in terms of understanding the broader picture, the data available from different sources/ departments also could be outdated.

Fig 67: Table showing the list of data made available with remarks

xi. Conclusion

'Loops as Leverage', as a spatial framework for circular neighborhoods is an attempt to approach the conventional city planning exercise as an accessible and collaborative activity, through the play of toolboxes. Overall, the project focused on three goals:

a) Simplifying the concept of circularity

b) Planning at scale

c) Embedding system-thinking and scalability

The concept of circularity was simplified in multiple ways. The four loops brought the focus to primary energy flows. The action words under each loop presented an easy-to-comprehend language. The tools provided across each loop offered the palette of potential interventions to achieve circularity. Also, the complementary information added to each tool has facilitated informed decisions while planning and design.

The project scope progressively traces different issues and details at appropriate and hierarchical scales. From setting the vision at the city-level for Circular Covai, developing a Framework Plan at the neighborhood-level, then creating a Concept Master Plan at the subsite-level, and boiling down to a specific design project, the scales were well articulated and addressed.

In alignment with the above, the project has looked at ways in embedding system thinking - both at concept development (eg: from water collection to recharge) and strategic implementation (from piloting catalyst projects to expanding networks).

rad OFFICE and the collaborators of 'Loops as Leverage' look at this work as a spark for much extensive research and implementation works in the future. The vision for circularity with no doubt needs to be embedded within the development framework of our cities, and we believe this work will inspire and guide many others embarking on that journey.

A. References

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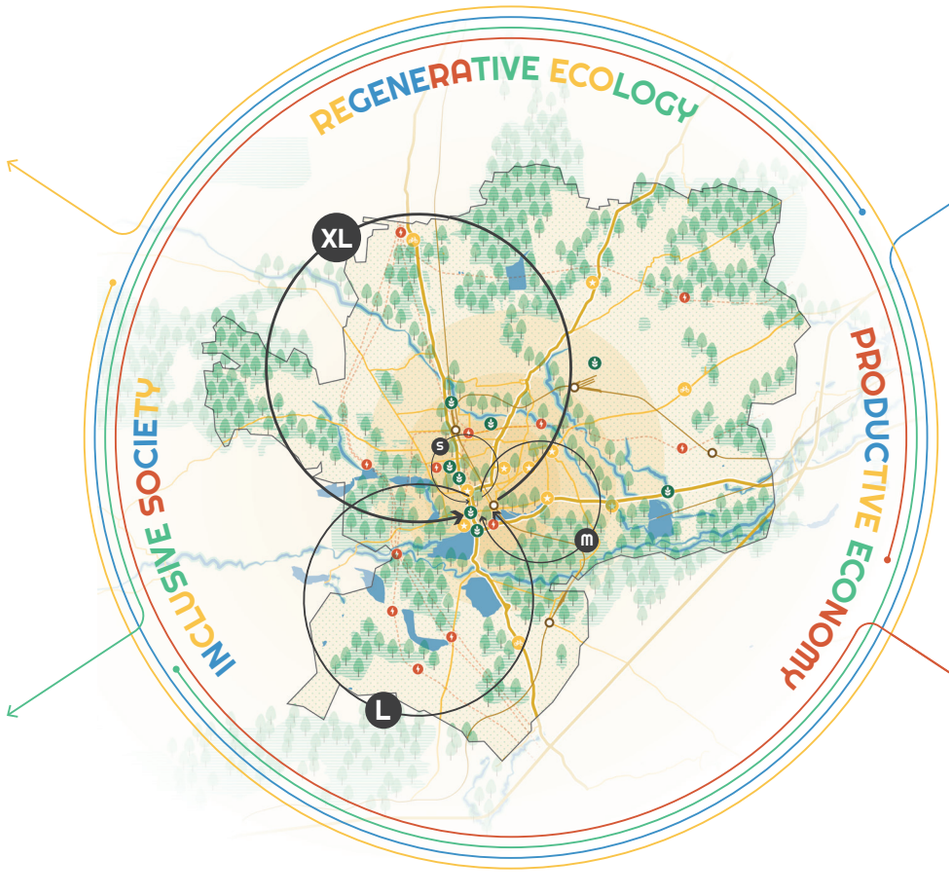
B. List of figures

Circular Covai Bilingual Pamphlet

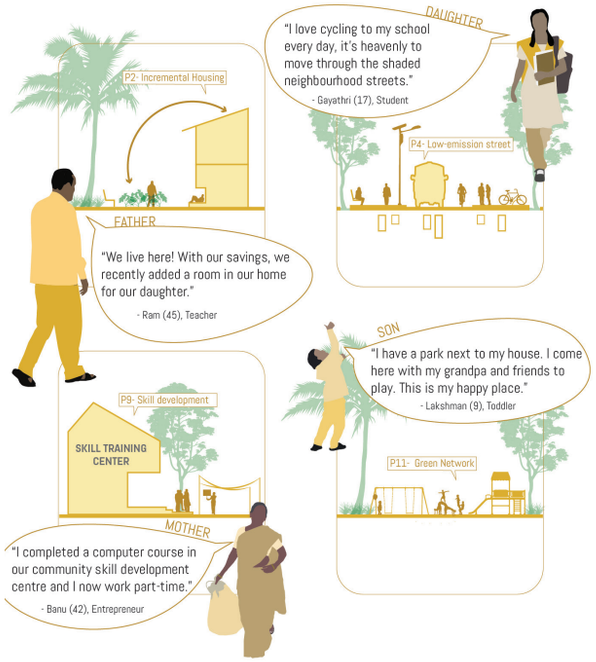
CIRCULAR COVAI VISION
வளங்குன்றா கோவை விஷன்



PEOPLE LOOP . மக்கள்

To enhance livability, promote sustainable mobility, improve economic viability, and share social amenities

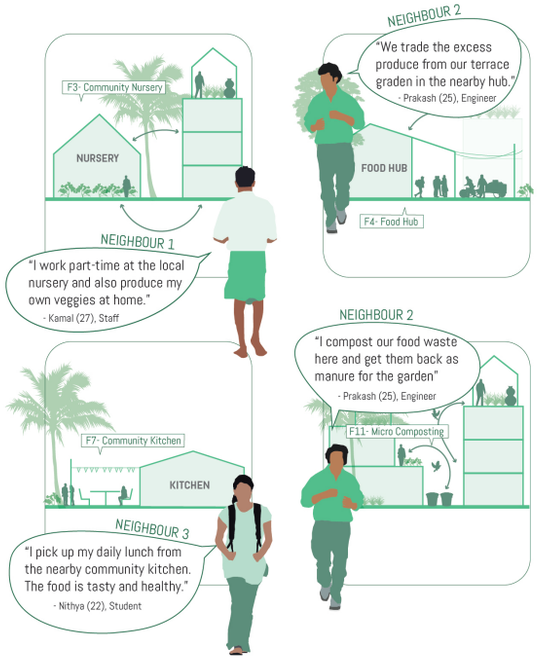
Live. Move. Work. Engage



FOOD LOOP . நீர்

To enable self-sufficiency, manage produce, monitor health, and manage waste

Produce. Trade. Consume. Compost



INDIA'S FIRST CIRCULAR CITY!

Circular Covai Vision imagines Coimbatore as a pioneer and national leader in developing circular cities in India, complementing the city's Smart Cities Mission. The city is envisioned to be a resource-efficient, robust, and resilient urban agglomeration of the future, with specific emphasis on the resource flows of people, water, food, and energy networks.

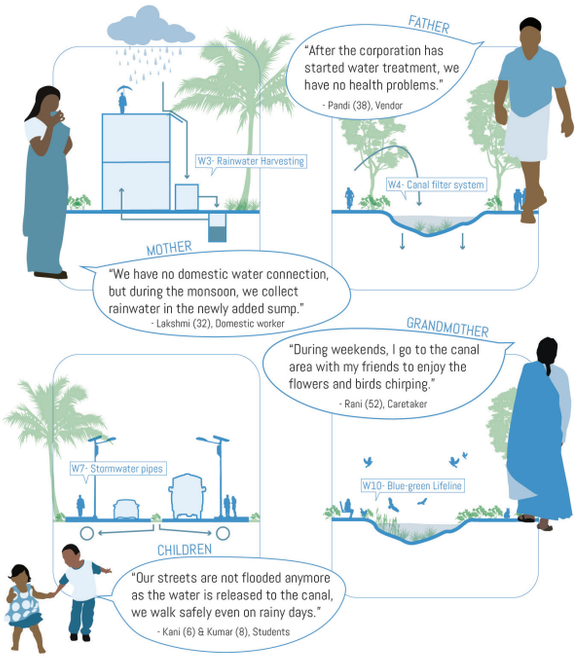
இந்தியாவின் முதல் வளங்குன்றா மாநகரமாக கோவை!

வளங்குன்றா கோவை விஷன், இந்திய அளவில் வளங்குன்றா வளர்ச்சி முறைகளை செயல்படுத்துவதில் கோயம்பத்தூர் மாநகரை முன்னோடியாக நிறுத்துகிறது. இது ஸ்மார்ட் சிட்டி மிஷனின் கூறுகளோடும் ஒத்துப்போகிறது. மக்கள் வளம், நீர், உணவு, மற்றும் எரிசக்தி ஒருங்கியங்களின் வள ஆதாரங்களுக்கு முக்கியத்துவம் அளித்து, கோவை எதிர்காலத்தில் ஒரு வளமிகு மற்றும் வலுமிகு பெருநகர் பகுதியாக அமைய இது வழிவகுக்கும்.

WATER LOOP . உணவு

To harvest rainwater, optimize resources, restore biodiversity, and rejuvenate natural systems

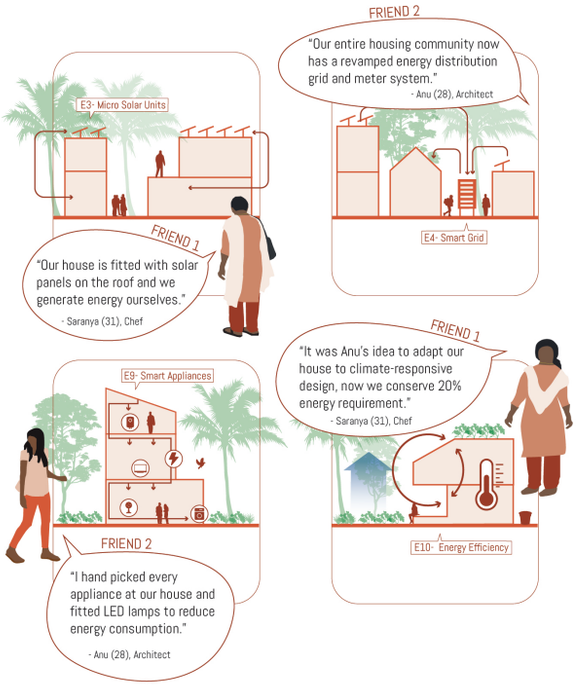
Collect. Treat. Release. Restore



ENERGY LOOP . எரிசக்தி

To maximise the use of renewals, ingrain efficiency, choose right products, and integrate passive natural systems

Generate. Distribute. Utilize. Conserve



DID YOU KNOW?

உங்களுக்கு தெரியுமா?

Circular development could lower greenhouse gas (GHG) emissions by 44% and bring India annual benefits of Rs. 40 lakh crore by 2050!

வளங்குன்றா வளர்ச்சி அணுகுமுறை 2050-க்குள் இந்தியாவின் பைங்குடில் வளிக்கள்(GHG) உமிழ்வை 44% குறைத்து, வருடாந்திர நன்மைகளை 40 லட்சம் கோடி-ஆக உயர்த்தக்கூடும் !

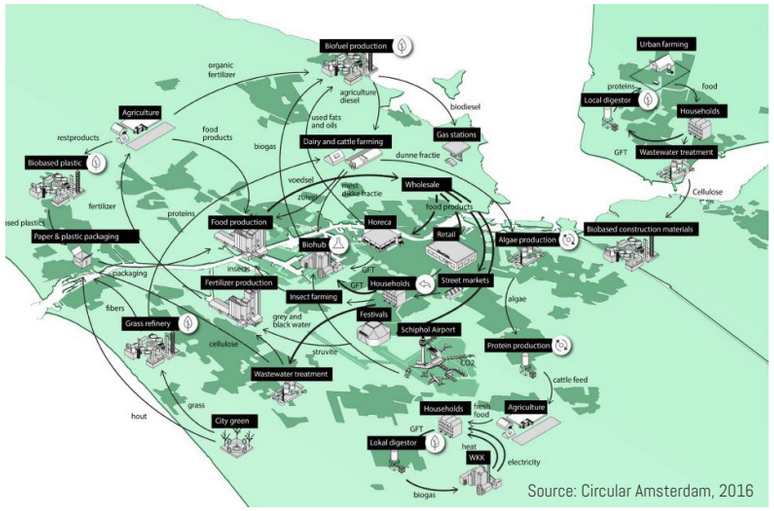
Source: Ellen MacArthur Foundation, Circular Economy in India: Rethinking growth for long-term prosperity, 2016

GLOBAL CIRCULAR CITY VISIONS

வளங்குன்றா வளர்ச்சியால் எவ்வாறு நகரங்கள்

In 2015, the city of Amsterdam commissioned the world's first city-wide Circular Economy Scan to gain an overview of the key material flows in the city and understand the potential economic and environmental benefits of keeping these materials in higher-value uses. These included job and GDP creation, lower greenhouse gas emissions, and waste disposal. The city focused on two concrete value chains – Construction and Food – to render the concept tangible. The proposal also assessed four main effects: (1) value creation, (2) CO2-reduction, (3) material savings and (4) job growth.

2015 ஆம் ஆண்டில், ஆம்ஸ்டர்டாம் நகரம் உலகின் முதல் நகர அளவிலான சுற்றறிக்கை பொருளாதார ஸ்கேன் 2015 ஐ நகரத்தின் முக்கிய பொருள் பாய்ச்சல்களைப் பற்றிய கண்ணோட்டத்தைப் பெறவும், இந்த பொருட்களை அதிக மதிப்புள்ள பயன்பாடுகளில் வைத்திருப்பதன் சாத்தியமான பொருளாதார மற்றும் சுற்றுச்சூழல் நன்மைகளைப் புரிந்துகொள்ளவும் நியமித்தது. வேலை மற்றும் மொத்த உள்நாட்டு உற்பத்தியை உருவாக்குதல், குறைந்த பசுமை இல்ல வாயு உமிழ்வு மற்றும் கழிவுகளை அகற்றுவது ஆகியவை இதில் அடங்கும். கட்டுமானம் மற்றும் உணவு - இரண்டு உறுதியான மதிப்பு சங்கிலிகளில் நகரம் கவனம் செலுத்தியது. (1) மதிப்பு உருவாக்கம், (2) CO2- குறைப்பு, (3) பொருள் சேமிப்பு மற்றும் (4) வேலை வளர்ச்சி ஆகிய நான்கு முக்கிய விளைவுகளையும்



Source: Circular Amsterdam, 2016

Many cities have already adopted the circular cities model like Amsterdam, Brussels, Capetown, Glasgow, London, San Francisco, and Toronto!

ஆம்ஸ்டர்டாம், பிரஸ்ஸல்ஸ், கேப்டவுன், கிளாஸ்கோ, லண்டன், சான் பிரான்சிஸ்கோ, மற்றும் டொராண்டோ ஆகிய உலக பெருநகரங்கள், வளங்குன்றா வளர்ச்சி பாதையை நோக்கி பயணிக்க தொடங்கிவிட்டன.

DID YOU KNOW?

உங்களுக்கு தெரியுமா?

HOW CAN CIRCULAR DEVELOPMENT BENEFIT CITIES?

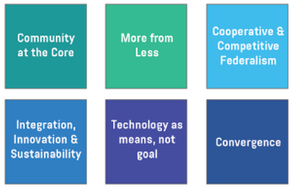
வளங்குன்றா வளர்ச்சியால் எவ்வாறு நகரங்கள் பயனுறும்?

Circular development looks at potential interdependencies between various resource flows and creates pathways for integration and mutual exchanges. For example, instead of letting organic food waste from urban areas be dumped in a landfill, it can be composted to be reused in crop production. Circular approach also can foster the emergence of thriving, liveable, and resilient cities. This pamphlet gives a glimpse on Circular Covai Vision and the resource loops in focus.

வளங்குன்றா வளர்ச்சி பல்வேறு வள ஆதாரங்களுக்கிடையே(மக்கள், நீர், உணவு, எரிசக்தி) ஆக்கப்பூர்வ ஒருங்கிணைப்பு மற்றும் பரஸ்பர பரிமாற்றத்திற்கான பாதைகளை உருவாக்குகிறது. உதாரணமாக, நகர்ப்புறங்களிலிருந்து வரும் உணவு கழிவுகளை ஒரு நிலப்பரப்பில் கொட்டுவதற்குப் பதிலாக, அதை உரமாக்கி பயிர் உற்பத்தியில் பயன்படுத்தலாம். வட்ட வளர்ச்சி அணுகுமுறை வளமான, வாழக்கூடிய, மற்றும் மீள்திறன் கொண்ட நகரங்களை உருவாக்க வழிவகுக்கும். இந்த துண்டுப்பிரசுரம் வளங்குன்றா கோவை விஷனின் முக்கியத்துவம் வாய்ந்த வள ஒருங்கியங்களை அறிமுகப்படுத்துகிறது.

United Nations SDG

National Smart Cities Mission



Circular Covai Vision Goals

Resource Loops

For more information, scan this QR code
கூடுதல் தகவலுக்கு இந்த QR-கோடை ஸ்கேன் செய்யவும்

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CIRCULAR COVAI VISION

வளங்குன்றா கோவை விஷன்

WHAT IS URBAN CIRCULARITY?

'Urban Circularity' is a sustainable development approach for planning, designing, and managing life. It aims to synergize the flow of resources such as water, food, energy, waste, building materials, and so on, to transition from a linear model (make, use, dispose) to a circular model (make, use, reuse and recycle back into the system). Urban Circularity is also an ideology for redefining urban lifestyle.

நகர்ப்புற வளங்குன்றாமை என்றால் என்ன?

'நகர்ப்புற வளங்குன்றாமை' என்பது நிலையான வளர்ச்சிக்கு தேவையான திட்டமிடல், வடிவமைத்தல், மற்றும் நிர்வாகம் சார்ந்த ஒரு அணுகுமுறையாகும். நீர், உணவு, எரிசக்தி, கழிவு, கட்டுமானப் பொருட்கள் போன்ற வளங்களின் உற்பத்தி மற்றும் நுகர்வு ஒட்டத்தை ஒரு நேர்கோட்டு மாதிரியிலிருந்து (குயாரித்தல், பயன்படுத்துதல், அப்புறப்படுத்துதல்) ஒரு வட்ட மாதிரியாக (குயாரித்தல், பயன்படுத்துதல், மறுபயன்பாடு மற்றும் மறுசுழற்சி) மாற்றி அமைப்பதே வளங்குன்றா வளர்ச்சி கொள்கையின் முக்கிய நோக்கமாகும். மேலும் இது நகர்ப்புற வாழ்க்கை முறையை மறுவரையறை செய்வதற்கான ஒரு சித்தாந்தமாகும்.