

IFLA Green Library Award 2022

Submission for Category: 1. Best Green Library

Presentation

(Submission type: Slides)

Submitted by:

**Planning & Development Division, Archives & Libraries Group
National Library Board Singapore**



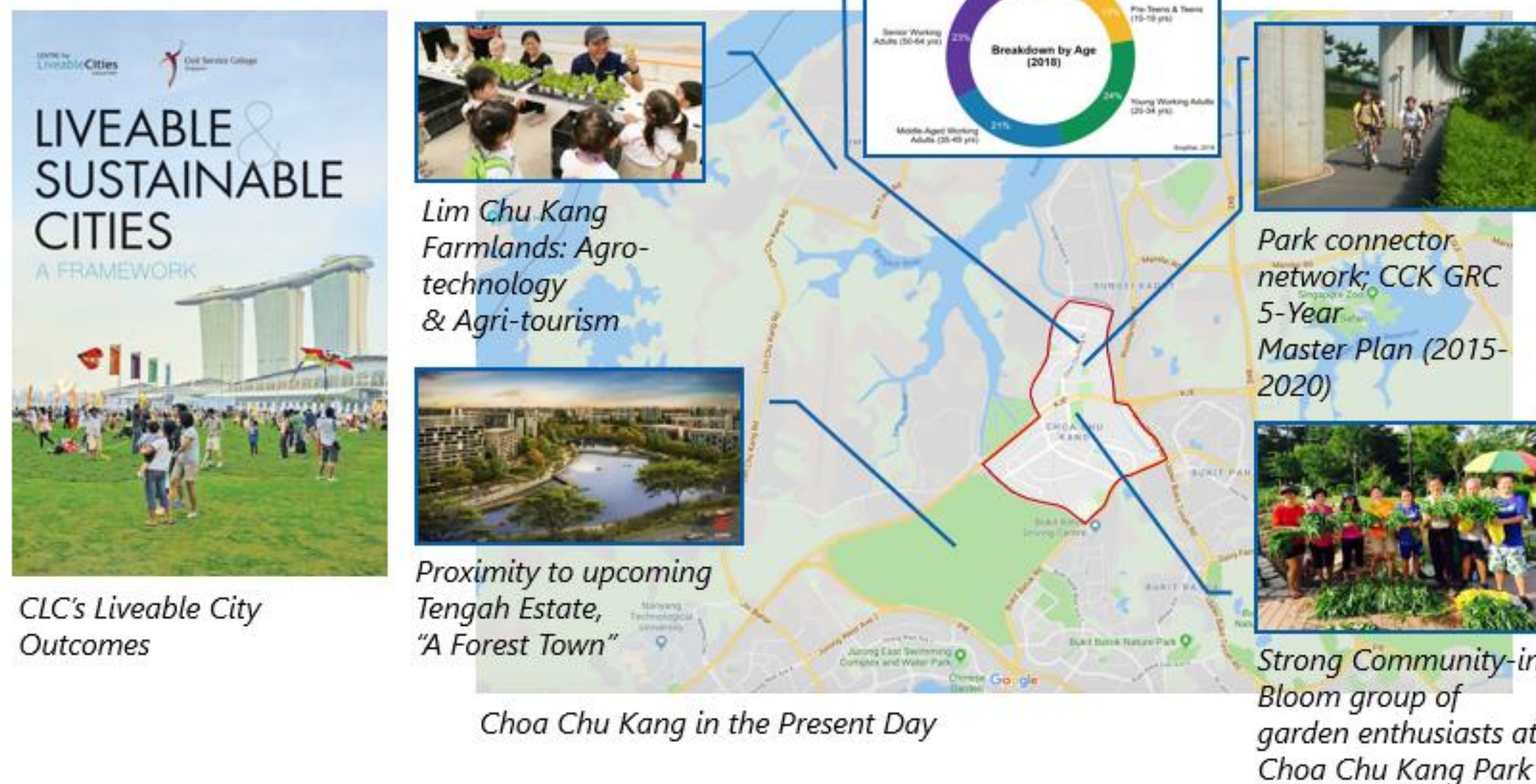
National Library Board
Singapore

PROJECT DESCRIPTION

Theme: (Re)Connect with Nature



Choa Chu Kang's Farming Heritage



Choa Chu Kang Public Library was closed for revamp in 2019, and reopened in **October 2021** with an expanded space from 2320 to 3000 sqm and adding another floor to the existing space.

As a neighbourhood library, it is themed **(Re)Connect with Nature**, the design approach to the library is guided by the historical significance of *Choa Chu Kang* being surrounded by various plantations and farms, and the context in its present day gearing towards the concept of nature, livability and sustainability.

The Theme

The development of the theme is led by,

- Centre for Liveable Cities' *Liveable City Outcomes*
- Choa Chu Kang's farming heritage
- Community engagement and analysis
- Reference to local and global trends, with the aim to,
 - Reignite interest in the concept of sustainable living
 - Recollect importance of nature in everyday life to improve one's well-being
 - Sustain the vision of Singapore as a garden city.

PROJECT DESCRIPTION

Theme: (Re)Connect with Nature

LAYOUT PLAN

- 01 24-hour Lobby & Exhibit area
- 02 Adult Collection (Popular Non-Fiction)
- 03 Adults Collection (General Non-Fiction, EN Fiction)
- 04 Languages Collection
- 05 Singapore Collection
- 06 Young Adult Collection & Reading Area
- 07 Older Children Collection
- 08 Programme rooms
- 09 Study Lounge & MMS
- 10 Green Grove Area
- 11 Reading Lounge
- 12 Story Telling Area
- 13 Early Literacy Collection
- 14 JP Collection
- 15 Parenting Collection
- 16 Indoor Courtyard Garden



Level 4



Level 5

The Design Approach & Objectives

- Inspire and be a catalyst for the Choa Chu Kang community to *re(connect) with nature* through learning about nature, liveability and sustainable living
- Activate learning spaces in the library to cater to changing lifestyle needs through services, programmes, collection and other learning resources to inculcate an interest in greenery
- Combined elements of design and technology to provide an immersive, multi-sensory reading and learning experience through its unique installations. Reflect nature in its design language through the use of elements, fixtures, form, colours and materials.

Overall Layout

- The library expands to a floor area of 3,000 sqm by gaining an additional floor at *Level 5* in LotOne Shoppers' Mall, Choa Chu Kang
- *Level 4* is now catered to Adults, Seniors, Teens and Older Children (7-12 years); while *Level 5* is catered to Parents and Young Children (0-6 years) and a new Indoor Garden.

PROJECT DESCRIPTION

Approach to the Spatial Design

Themed **(Re)Connect with Nature**, the design approach sought to create an interactive space that nurture learning, discovery and sharing of Choa Chu Kang's rich agriculture, biodiversity heritage and sustainable living.



Main entrance with gated entry, lobby and Nature Walls



Adult Zone and the Hydroponic Showcase



Adult Zone

Featured Spaces: Lobby, Exhibition Area, Adult Zone

- Entry through the main entrance at Level 4, customers arrive at the *lobby* where self-service facilities, such as books return, reservation lockers are available during and beyond opening hours
- The gated entry allows customers to enter the *Extended Hours Service* and access library's space beyond opening hours
- The *Nature Walls* acts as visual guide, leading customers into the different spaces while maintaining visibility between different spatial zones. The porous design of the *Nature Walls* integrates resin panels with imageries of flora and fauna extracted from the National Library's extensive collection
- Art installations with sustainability themes, to raise awareness are placed at the lobby and exhibition area (Adult Zone).

PROJECT DESCRIPTION

Approach to the Spatial Design



Featured Space: Programme Rooms, Level 4

- The treated walls provide customers with a visual and textural experience, which also serve as acoustic treatment to sound-proof the spaces
- New automatic mechanism, *Skyfold* separates/combines the two Programme Rooms where required, provides flexibility and efficient use of spaces.



Featured Spaces: Study and Multimedia Zone, Community Wall, Reading Zone, Level 4

- *The Community Wall* leads customers to the hybrid space of *Study and Multimedia Zone* and the *Reading Zone*, which is also accessible during *Extended Hours Service* (outside library operating hours)
- The *Community Wall* showcases information about Choa Chu Kang's heritage and present day communities to inform and engage customers.



PROJECT DESCRIPTION

Approach to the Spatial Design



Featured Space: Green Grove, Level 4

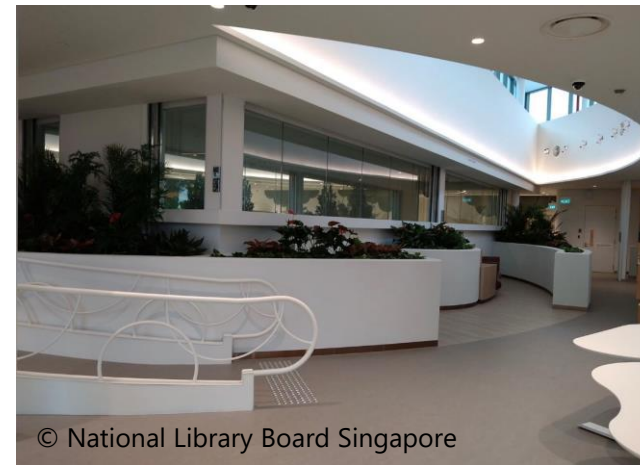
- The **Green Grove** is a curated corner that cultivates environmental awareness and literacy by showing the intricate links between humans and their local environments
- The Green Grove features a *Hydroponic Showcase*, a *Live-Statistic Display* on nature and environmental related information and news, *AR Learning Trail* as well as the *Climate-Action Corner*
- The *Hydroponics Showcase* also runs accompanying workshops and tours aim to foster interest in urban farming solutions and food security in Singapore.

Featured Space: Sunken Reading Area, Level 4

- The area houses the Teens' Collection and overlooks a long stretch of windows that allows natural light in the space
- Green elements represented by terrarium-like displays for variation and easy maintenance
- Suspended ceiling feature mirrors the furniture below and enhances space verticality.

PROJECT DESCRIPTION

Approach to the Spatial Design



Indoor Garden

Feature space: Children Zone, Indoor Garden, Level 5

- The first *Indoor Garden* in Singapore's Public Libraries, forms the core of the space, with seating, shelving and programming areas planned around the *Indoor Garden* to create a seamless spatial experience
- Apart from maintaining the same design language throughout the library, the *Children Zone* has placed a greater focus on being fun, safe and family-centric, as well as referencing to the farming heritage and community gardening culture of Choa Chu Kang



Story Circle and seating area

- The *Story Circle* is the destined storytelling area designed to be an open space and to cater for interactivity, with modular furniture of ottoman and pouffes, to be set-up according to varied storytelling sessions, or to be used as a reading space outside the planned sessions.



PROJECT DESCRIPTION

Approach to the Spatial Design



[A]



[B]



[C]



[D]



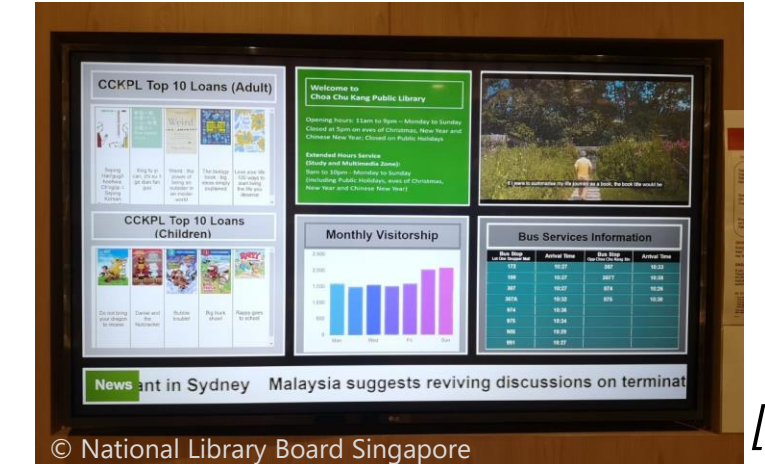
[E]



[F]



[G]



[H]

Features Highlight: Design Language

- The revamped library is designed to utilize all the windows and skylights within the spaces, to allow natural light to filter through the library. Reading and study spaces are set up along the perimeter of the windows, where natural light is the most prevalent [B, C]
- The design elements are chosen to reflect the nature theme, such as leafy parasol lamp-shade [A], artificial garden lightbox [A], tree book display [D], vegetable-cart bookshelves [E], terrarium-like display [F] and mushroom lamps [G].

Features Highlight: Shared Spaces and Facilities

- The *Live-statistic Display* [H] is located at the entrance of the library, provides information on top-loans items at the library, peak period at the library, videos produced by NLB, real-time public transport information at the Mall and news updates
- Throughout the library, ample reading, study, eating areas and multimedia stations are set-up to cater for customers' usage.

APPROACH TO THE DESIGN

Infrastructures with Sustainable Attributes

The overall approach to the infrastructure is to use **sustainable materials** for interior works, such as (partially) recycled or bio-based content for flooring, low volatile organic compound paint finishing, plant-based product for furniture fabrics and with biodegradable packaging.

Vinyl Floor Tiles (Brand: Forbo)

- Made of 49% recycled content
- Reduced installation wasted as there are no repeated patterns
- Manufactured in facilities that are certified to ISO 14001-environmental mgmt. standards. Facilities also adhere to social standards that protect employees & suppliers and they are the first flooring company to do so.
- Water-based inks & dyes used to manufacture the tiles with no additional chemical processes besides high temp steam treatment to secure colours.

Carpet Floor Tiles (Brand: Interface)

- Carbon negative flooring tiles made of bio-based and recycled content which greatly reduces carbon footprint during manufacturing.



Paint Finishing (Brand: Sherwin-Williams)

- SW's paint products have low VOC which contributes to Green Mark attributes.

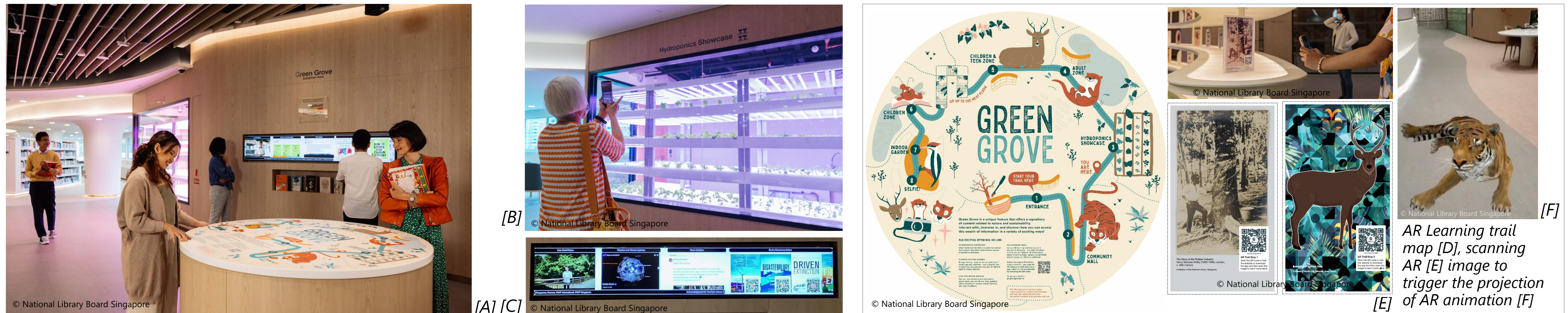
Furniture Fabric (Brands: Innovasia, Carnegie Fabrics)

- Innovasia uses oxo-biodegradable packaging for fabric rolls, works with suppliers that are environmentally accountable and offer sustainably-produced high quality textiles
- Carnegie Fabrics manufactures fabrics using a plant-based product with a significantly reduced carbon footprint. They are also a certified B Corp company.

APPROACH TO THE DESIGN

Features and Content

In line with NLB's core service of knowledge-sharing, Choa Chu Kang Public Library sought to raise awareness on sustainability not only through a suite of eco-centric services/programmes, but also reimagined the learning experience of a library with new features.



Feature Highlight: Green Grove, Level 4

- The **Green Grove** [A] is a curated corner that cultivates environmental awareness and literacy featuring,
 - A **Hydroponics Showcase** [B] showcases urban farming, complemented by workshops on urban farming solutions and food security in Singapore
 - The **Climate Action Corner** and **Live-Statistics Display** [C] display information on climate change, weather forecasts, nature-related news and events, daily weather/air quality forecasts, climate change/environment statistics/information, nature-related videos and nature-related e-book recommendations
- The **AR Learning Trail** [D, E, F] encourages immersing in AR content and physical spaces, that could broaden customers' knowledge on wildlife species and local natural landscapes. To experience the *AR Learning Trail*, customers can use their mobile devices to scan the markers at eight pit stops to make content come alive.

APPROACH TO THE DESIGN

Features and Content



[A] Community Wall (Heritage section)



[B] Community Wall (Community section)



[C] Story of Choa Chu Kang (Heritage section)



[D] Community contribution (Community section)

Feature Highlight: Community Wall, Level 4

- The **Community Wall** is the first of its kind among the public libraries in Singapore, featuring both historical and modern-day sections with elements unique to the Choa Chu Kang, from its agricultural heritage to a transformation to agrotechnology and new generation farms today
- *Heritage section {A, C}* features interactive heritage elements, from flip panels on the name origins of different places around Choa Chu Kang, to a personal anecdote of a villager joining a tiger hunt at Choa Chu Kang

- The *Story of Choa Chu Kang [D]* section captures the story across four different time periods – *the beginnings and origins of Choa Chu Kang* where immigrants settled and a thriving farming community was formed; *the changing landscape* from kampungs (village) to public housing; *modern day Choa Chu Kang* and *the transformation* to agrotechnology and new generation farms
- The *Community section {B, D}* allows customers to contribute their own memories, experiences, and thoughts on the wall, and in the process, showcase the kampung spirit that the wall hopes to foster.

APPROACH TO THE DESIGN

Features and Content



Nature Walls



Feature Highlight: Nature Walls, Level 4

- **Nature Walls** displays curated imageries featuring an array of natural history books, botanical prints and plantation photographs from the *National Library's* extensive collection and *Muséum national d'Histoire naturelle, Paris*
- Feature walls guide customers into the space while maintaining visibility between different zones.



Indoor Garden

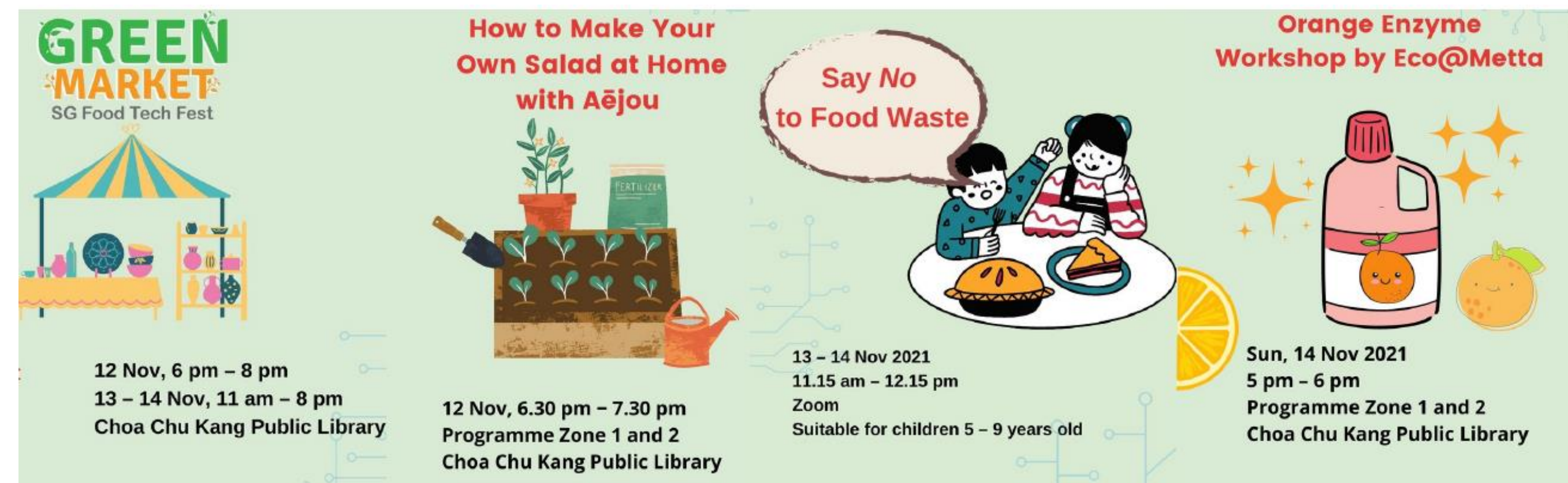


Feature Highlight: Indoor Garden, Level 5

- The **Indoor Garden** is the first one featured in a public library in Singapore. It is an addition to highlight the theme and the farming heritage and community gardening culture of Choa Chu Kang, while providing a natural and peaceful space for customers to read or relax while watching over their children/charges.

APPROACH TO THE DESIGN

Features and Content



Content Highlight: Sustainability-focused content and programmes

- **Green Market** and **Great Make-Over Project** feature talks, workshops, exhibitions, and co-solutioning to reimagine spaces to encourage the pursue of sustainable goals as a community
- The inaugural launch of **Green Market** which promotes sustainable living as a community and ways to engage in sustainable practices featured programmes. Start-ups and green groups in the food technology and urban farming industry who shared about their latest innovations and initiatives

- The **Green Makeover Project** encourages community co-solutioning to reimagine and reinvent spaces to promote sustainable living, where selected proposal will undergo the 6-week bootcamp style project. Projects will then be showcased at the libraries to encourage others to take action for the environment
- **Commissioned art installations** to raise awareness of various sustainability issues
- **Volunteering programmes** that encourage communities to do their part to protect the environment.

APPROACH TO THE DESIGN

Features and Content



Content Highlight: Sustainability-focused content and programmes for children and teens

- Early Read Environmental Literacy Carnivals (activities to teach concepts of recycling)
- Dramatised performances about nature conservation
- Eco-themed workshops (e.g. terrariums, sustainable fashion, bubble tea holder) and Hackathons
- Eco-themed programmes in collaboration with partners (e.g. WWF, HSBC x Ripples, ACRES)

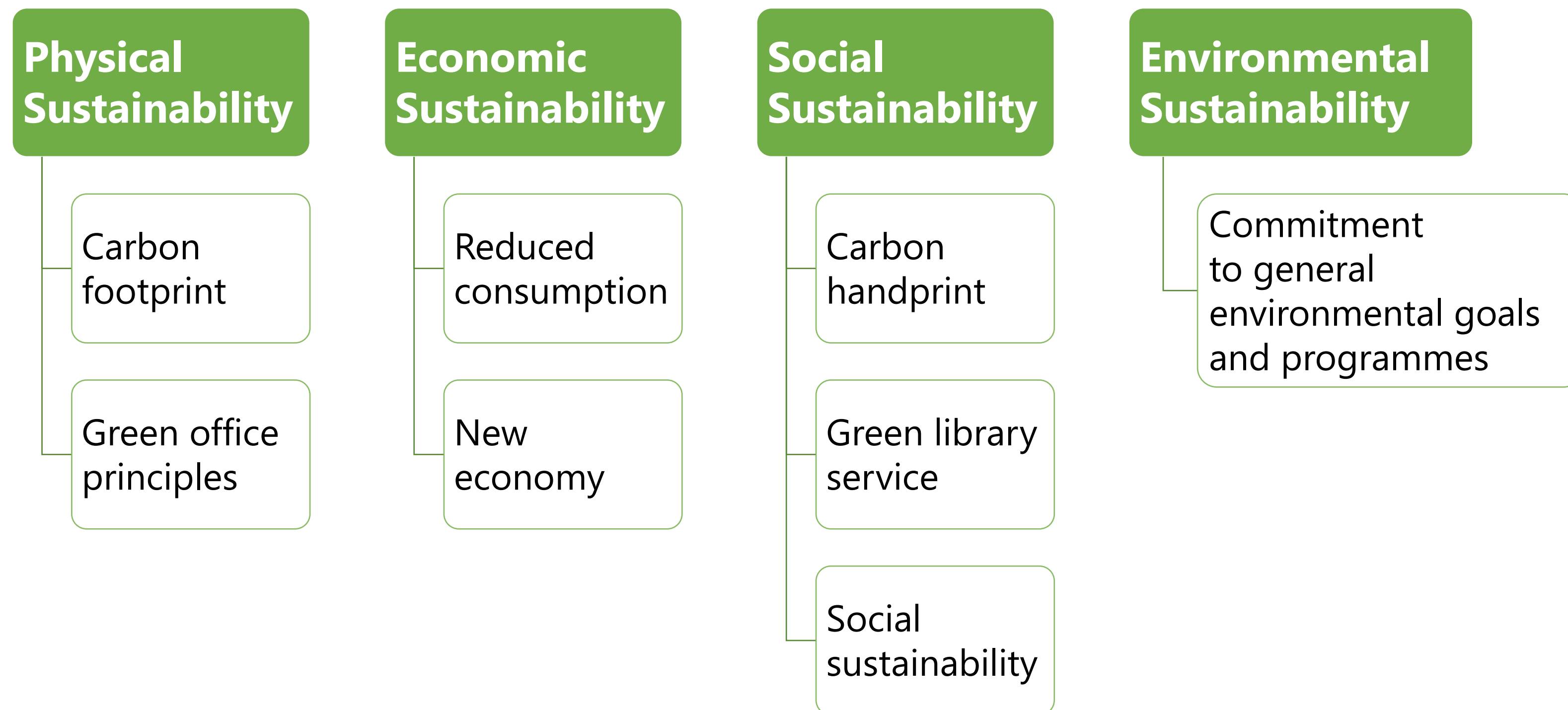
• Programmes for adults and seniors

- Book displays
- Sustainable visual art installations
- *Make Your Own!* Workshop series
- Set-up of new and build on existing eco-focused learning communities (e.g. Repair Kopitiam, Nature Photography interest group)
- Eco-themed programmes in collaboration with partners (e.g. PUB, Food Bank Singapore, Bamboo Straw Girl).

APPROACH TO THE DESIGN

Design Outcomes

Themed ‘**(Re)Connect with Nature**’, the library has not only applied the interior works with use of more environmentally friendly materials, but also to create an experiential communal space that promotes environmental awareness and interest in sustainable living, focusing on the sustainability pillars of *environment, culture, and society*. The designed spaces aim to cater to changing lifestyle needs through services, programmes, collection, and other learning resources with features such as the **Green Grove** (which encompassed *Climate Action Corner, Hydroponics Showcase, Live-Statistic Display, AR Learning Trail, Green Market, Great Make-over Project*), *Indoor Garden, Community Wall, Nature Walls, art installation and Volunteering Programmes*.



APPROACH TO THE DESIGN

Design Outcomes

Physical Sustainability

To address the carbon footprint and energy efficiency, accessibility and green offices routines put in place.

Carbon Footprint

Accessibility



- Lot One Shoppers Mall locates centrally in Choa Chu Kang town, serves local residents with its wide range of retail and services
- Easily accessible by neighbouring towns and with several schools in the vicinity.

Transportation



- Lot One Shoppers' Mall connects directly to various public transport (a bus interchange, two bus-stops, Mass Rapid Transit and Light Rail Transit Stations)
- Local residents can also reach the Mall by foot or bicycle.

Landlord's Support



- Supported by the Mall's Management team in sustainability efforts, where various activities are extended to all tenants at the Mall.
- *Green Grove* is sponsored by the charity arm of the Mall's owner (CapitaLand Hope Foundation), for the content and programming development, and volunteers support.

Green Office Principles

Carpet



- Certified with Singapore Green Label with more than 40% of recycled content by product weight
- Only low-pile or less allergen-attracting carpet is used
- Installation by Tactile Method (100% glue free or minimal).

Paints



- Low-VOC (volatile organic compound) and low-toxic interior paints are used to reduce toxins and maintain good air quality.

Water Efficient Fittings



- All water fittings, such as flushing cisterns and taps are fitted with water-efficiency labelled products to save cost and water.

Smart Controls



- Motion sensors are installed as occupancy sensors in pantry/toilet in staff office and photocell light sensors for public area to control lighting when there is sufficient natural lighting.

Lightings



- Energy-saving lights are used which emit less heat and consume less energy.

APPROACH TO THE DESIGN

Design Outcomes

Economic Sustainability

To address the library's adoption of circular and sharing economy, with shared spaces and devices for the community.

New Economy

Self-service



- Do-it-yourself services to encourage and allow customers to be self-reliance, services available included borrowing stations, catalogue search, book reservation locker/collection
- Reduce man-power on front-line service
- *Extended Hour Service* allows the customers to enter the library through tap-access gated entry system, to utilities a selected library's space outside opening hours.

Shared spaces and devices



- *Extended Hours Service* is piloted at the Study and Multimedia Zone, where the space is available for public use before and after library's operating hours, extending the usage of communal space
- Multimedia stations are setup for customers' use, with easy access to e-resources, such as online learning, e-newspaper and internet access
- Study and reading areas are expanded for customers' use, spreading across the two levels of the library, providing ample seating areas for reading, studying and working.

APPROACH TO THE DESIGN

Design Outcomes

Social Sustainability

To address carbon handprint of shared resources, easy access to sustainability/environmental information and engage community.

Carbon handprint

Shared resources



- A collection of 180,000 volume of books shelved at the library for customers
- Shared spaces within the library with ample reading and study areas, seating and programme rooms
- Shared devices such as multimedia stations and storytelling stations for customers' use, and easy access to e-resources, online learning, e-newspaper and internet access.

Green library services

Access to information



- Green Grove is a curated cul-de-sac containing information and news related to nature, the environment and climate change, both digital and analogue, featuring *Hydroponics Showcase*, *AR Learning Trail*, *Climate Action Corner* and *Live-statistic Display*.

Social sustainability

Community engagement



- Conducted engagement sessions with local residents to gain feedback and insights (library users and non-users), and with staff to better understand operational consideration during the project ideation phase
- Incorporate solutions developed from the insights for the spatial design, services, collection and programmes
- Recognise the customers' changing needs and interests, by creating spaces for them to socialise, learn, or participate in Green initiatives, and fostering the community spirit for the neighbourhood
- Engage volunteers to support the operation and programmes at the library.

Lifelong-learning



- Align with NLB's core service of knowledge-sharing, with suite of eco-centric services/programmes, and reimagine the learning experience of the library
- In-line NLB playing an *Equaliser* role, bridging societal gaps and empower as many people as possible, by providing the opportunities to experience and understand the smart technologies behind the Hydroponics Showcase, such as AI, Cloud and AR.

APPROACH TO THE DESIGN

Design Outcomes

Environmental Sustainability

To address the library's work in fulfilling the UN SDGs' goals.

Commitment to environmental goals and programmes

SDG Goal 4 *"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"*



Target 4.7: Global citizenship education and education for sustainable development

- With pressing climate issues and rapid advancements in technology, there is a need to cultivate an understanding and appreciation for the natural environment, driving home the message of personal and social responsibility that we should adopt in our daily lives
- The Library combines elements of design and technology to provide an immersive, multi-sensory reading and learning experience through its unique installations
- In line with NLB's core service of knowledge-sharing, the library sought to promote learning and knowledge-sharing through a suite of eco-centric services/programmes, also reimagine the learning experience of the library
- Align with NLB playing an *Equaliser* role, bridging societal gaps and empower as many people as possible, by providing the

opportunities to experience and understand the smart technologies such as augmented reality, or cloud and artificial intelligence used for the *Hydroponics Showcase*

- The *Green Grove* is a curated corner that combines nature and technology to spread environmental awareness and literacy by showing the links between humans and their environments
- The *Hydroponics Showcase* introduces topics on food security and urban farming solutions, paired with tours and workshops to deliver a holistic learning experience. Harvested crops are also shared among staff to create an ecological consciousness
- The *Climate Action Corner* promote sustainability through programmes/information on climate change to educate and provide inspiration on minimising one's carbon footprint
- The *Live-Statistic Display* showcases real-time environmental and nature-related, which includes weather forecasts and air quality information, environment and nature-related news from organisations such as World Wide Fund for Nature (WWF) Singapore and Singapore Geographic, National Parks Board, and nature-related e-book recommendations from the library's digital collection.

APPROACH TO THE DESIGN

Design Outcomes

Environmental Sustainability

To address the library's work in fulfilling the UN SDGs' goals.

Commitment to environmental goals and programmes

SDG Goal 12 "Ensure sustainable consumption and production patterns"



Target 12.8: Provide relevant information and awareness for sustainable development and lifestyles in harmony with nature

- The *Hydroponics Showcase* introduces topics on food sustainability and urban farming solutions in line with Singapore's 30-by-30 (*Singapore Green Plan 2030*) goal.
- The *Hydroponics Showcase* is accompanied by the authentic learning experience of tours and workshops, where participants get close-up look at the crops at the different stages of growth, the smart technology behind the farming system, harvest vegetables, and participants will bring home a start-up kit to encourage their own growth of microgreens. Harvested crops are also shared among staff to create a culture of ecological consciousness
- Climate change affects food security and safety globally, with global food demand expected to increase, it is therefore important to develop a sustainable local supply food chain

- Use of technology to manage climate-controlled environments without reliance on climatic conditions, where oxygen levels, humidity, temperature are set-up to allow the growth of native and non-native vegetable varieties. The technology is designed to monitor the crops remotely, collect and analyse data with integrated artificial intelligence systems
- Urban farming uses under-utilised or unconventional spaces, by growing crops upwards instead of outwards, it uses tiered modules to increase crop production and optimizes space usage. Instead of soil, the farming system uses nutrient infused water, which could be recirculated to provide food source, and vastly reduce the water usage in traditional farming; it also uses LED in place of sunlight, where less heat is emitted
- Due to short supply chain, the shelf-life of locally produced food is less likely to be wasted.

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Thank You

