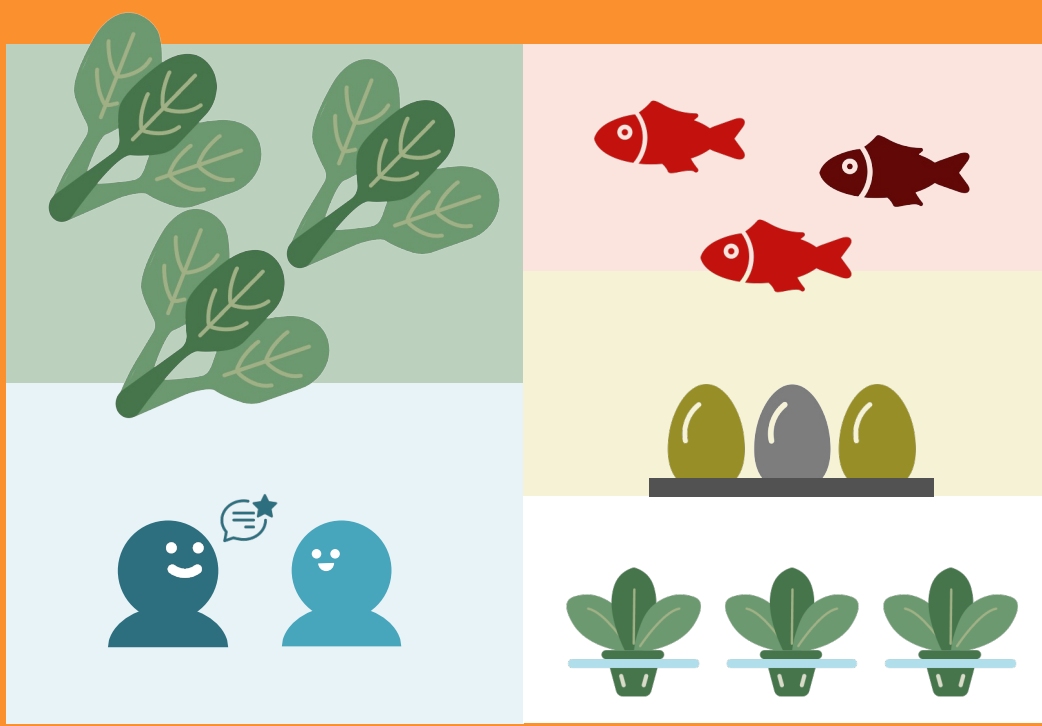
Stakeholder Engagement Report

for Lim Chu Kang Master Plan



ORGANISED BY:

Singapore Food Agency

IN SUPPORT OF:

SG TOGETHER

FACILITATED BY:

ThinkPlace

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PURPOSE OF THIS REPORT

This document captures the journey of the Lim Chu Kang Master Plan (LCKMP) Stakeholder Engagements conducted from May to October 2021.

With over 300 industry and public stakeholders engaged and free-ranging conversations over six months, this report seeks to capture the essence of those conversations.

The report provides a summary of each of the three phases:

- Phase 1 Consultation, which provided a broad overview of the LCKMP and sought to surface views and various fields of knowledge
- Phase 2 Consensus Building, which sought to frame the design challenge for Lim Chu Kang (LCK)
- Phase 3 Co-creation, in which groups formed around five major themes, and generated a vision and ideas for the future of LCK in more detail

The ideas shared in this report will be further studied by the Singapore Food Agency (SFA) and the master planning consultant for feasibility.

> How might we create an agriculture, food and technology ecosystem of the future that is productive, vibrant, innovative, sustainable and accessible to all.

Minister for Sustainability and the Environment Grace Fu with participants at the opening session of Phase 3

ABOUT THE ENGAGEMENT SERIES

The LCKMP Stakeholder Engagement series is organised in line with the Singapore Together movement and the Singapore Green Plan 2030.

In the spirit of the Singapore Together movement, SFA invited industry representatives and members of the public to join SFA in co-creating our vision for LCK. This initiative is part of our ongoing efforts to invite stakeholders to share their views and ideas on how we can raise local food production in a sustainable and resource-efficient manner in support of the Singapore Green Plan 2030.

Context

With over 90% of Singapore's food currently imported, producing more food locally is an important strategy to enhance the country's food security. SFA's '30 by 30' goal aims to build the capability and capacity of Singapore's agri-food industry to produce 30% of our nutritional needs locally and sustainably by 2030.

To do this, there is a need to optimise our limited agricultural spaces, such as the LCK area.

As one of the primary sites for agriculture in Singapore, what role can LCK play in ensuring our food security? The aim of reimagining the LCK is to transform it into Singapore's flagship agri-food production hub of the future that is vibrant, innovative, sustainable, and accessible to all.

Objective of the engagement series

There are many stakeholders with an interest in LCK, such as farmers, educators, nature groups, solutions providers, ecosystem players, members of the public and public officers. These stakeholders have diverse views on how LCK can enhance Singapore's food security.

As SFA embarks upon the master planning of the LCK area, it is important to engage these diverse views, to find the best possible outcomes for the stakeholders, the area and Singapore.

Over the course of six months, SFA engaged over 300 stakeholders through virtual and physical engagement sessions to identify and develop ideas to redevelop LCK into the collectively envisaged flagship agri-food production hub of the future.

THE ENGAGEMENT APPROACH

Engagement sessions were conducted between May and October 2021 in three phases. Over the three phases, participants progressively converged on a vision for LCK in increasing detail, with groups forming to develop particular aspects of the future vision. While the process raised multiple diverse interests and views, it helped participants to create a more nuanced and collective view of the future, with a better understanding of the trade-offs and implications of various actions and initiatives.

(May - June 2021) PHASE 1 STAKEHOLDER CONSULTATION

Around 300 citizens from diverse backgrounds, industry members and partners came together to share their views on food security and the Lim Chu Kang master plan

(Sep - Oct 2021) PHASE 3 CO-CREATION

About 50 workgroup members were invited to deepen their ideas on a key theme of their interest, co-create solutions and present their final recommendations

OPEN CALL FOR PARTICIPATION

More than 160 members of public expressed interest to participate in the engagement sessions

PHASE 2 (July 2021) CONSENSUS BUILDING

Building on the conversations from Phase 1, about 150 stakeholders from different professions, industries and backgrounds gathered to deepen discussions on key themes

SECTION 2

PHASE 1: THE CHALLENGES

What are the key challenges for LCK as an agri-food hub raised in Phase 1?

PHASE 1 OVERVIEW

The first phase of engagement focused on what Singapore's food future could be and what should be prioritised to enhance food security. Over four sessions from May to June, over 300 stakeholders from different professions, industries and backgrounds such as farmers, educators, nature groups, solutions providers, ecosystem players, members of the public and public officers gathered online to exchange views and ideas on Singapore's food security and the LCKMP. The sessions were helmed by Ms Grace Fu, Minister for Sustainability and the Environment, and Mr Desmond Tan, Minister of State for Sustainability and the Environment.

Participants were asked to identify the opportunities and key challenges in shaping the future LCK area into a key agri-food production hub for Singapore.

Minster of State Desmond Tan with participants in JEM

PHASE 1 CONVERSATIONS

(A) THE BALANCING ACT

Challenge: How might we balance different needs and priorities?

With only about 1% of land set aside for agriculture, participants recognised that there were competing needs for land use. To ensure Singapore's food security, participants acknowledged that food production would have to be prioritised over other aspects.

Participants highlighted the need to protect nature, ecology and biodiversity of the area vis-à-vis our development plans for LCK so that food production is not done at the expense of our environment. There was general consensus that while it was a good move to increase food production in the area, environmental sustainability was also a key consideration. For example, we would need to take into consideration the carbon emissions of farms so that the redeveloped LCK does not result in the pollution or degradation of the environment that may be detrimental to our ecology.

Participants also raised the importance of balancing between different food production methods. Some participants shared their thoughts on how, besides high-tech production methods, soil-based and/or organic farming could also play an important role in agri-production and in preserving natural resources. While participants discussed the merits of different farming methods, they felt that farms should adopt the method or technology that utilised less resources while being more efficient and sustainable.

In the area of food types, participants highlighted the need to strike a balance between the production of a range of food types to provide consumers with diverse choices on the one hand, and to limit the production to selected food types to enable farmers to reap economies of scale on the other.

To this end, participants suggested to prioritise a few food types that we ought to produce, taking into consideration the nutritional value of the produce and the resources needed to grow them. Participants also suggested that farmers focus on growing or creating niche products so that they need not compete with overseas producers on price.

Participants also discussed opportunities to incorporate environmental conservation, education and community outreach, to develop LCK into an attractive place to work, play and learn.

Zoom screen capture of Phase 1 discussions

(B) THE ECOSYSTEM CHALLENGE

Challenge: How might we build a shared thriving and sustainable local ecosystem?

Participants felt that there was an opportunity to develop an end-to-end ecosystem in LCK with supporting infrastructure and peripheral industries in the vicinity. They suggested that shared facilities could be situated within LCK to reduce the cost of resources such as water and power.

The LCK ecosystem could also include sustainability systems. Participants suggested the establishment of a circular system in LCK that would reduce resource use and waste. For example, the waste of one farm could be used as feed for others or converted into something useful.

Participants also suggested enhancements to infrastructure for water and electricity to support high-tech and productive farming systems.

Participants noted that while we grow our produce locally, some of the raw materials for production such as seeds are still largely imported. As such, local food production remains vulnerable to external factors such as disruptions in freight and shipping. There is hence a need to strengthen the supply resilience of these raw materials.

(C) THE ACCESSIBILITY CHALLENGE

Challenge: How might we enhance the vibrancy and accessibility of LCK

LCK is difficult to travel to via public transport, which makes it challenging for people to visit.

Participants highlighted the importance of improving the accessibility and connectivity of LCK as part of its redevelopment plans. They suggested that there should be a variety of transport options available to make LCK more accessible to visitors and workers.

Overall, participants felt that there was an opportunity to position LCK as an attractive location that offers accessibility, connectivity, food options and activities to cater to the different interests of Singaporeans.

(D) THE EXPERTISE CHALLENGE

Challenge: How might we build capability and capacity in food production?

To enhance food production, participants suggested for LCK to house R&D centres to prototype new food production methods, conduct research on high nutrient food types and how they could be produced locally, as well as to support the production of alternative protein products. Participants also suggested that we create a sandbox and provide space for businesses to test-bed their innovations and ideas.

Participants shared possibilities for technology and innovation to help farmers increase their yield as they scale up their production. For example, the agri-food industry could conduct research on seeds to facilitate high intensity growth or high-density cultivation of crops. They also discussed possibilities for the local industry to develop a unique soil-based or organic farming method which could play an important role in preserving natural resources. Local industry players could also develop farming technology which best suits the heat and humidity in Singapore.

Participants also suggested that we could earmark LCK as a space for the exchange of knowledge, skills and experience between different generations of farmers.

(E) THE PUBLIC EDUCATION, DEMAND AND BRAND CHALLENGE

Challenge: How might we enhance public education about local produce and rebrand the farming industry?

Ensuring there was demand for local produce was another challenge raised by participants. They shared that consumers may not see the value of buying local. To stay viable, producers may have to look to overseas markets to sell their produce. It was also difficult to understand and sense what Singapore residents are looking out for when it comes to local produce. Knowing more could give producers an indication of what to grow.

To this end, participants suggested that LCK could play a role in increasing awareness of local produce and educating the public on our food sources. They suggested the establishment of an education centre in LCK where educational tours could be conducted. Visitors and schools could also be linked up with farms for educational tours. Participants acknowledged that such tours could be at the expense of taking some resources away from full-fledge production. There were also opportunities for more ground-up initiatives to involve the community and mobilise them to support our local produce.

Participants also discussed ways in which Singapore could learn from other countries in developing LCK as well as in branding and positioning Singapore's local produce so as to transform Singapore's farming industry into a unique brand that will put it onto the world map.

On the farming industry, participants highlighted the need for a change in the perception of the industry in order to attract youths to take up a career in agriculture. For example, participants hoped that the redeveloped LCK would reposition the farming industry as modern and high-tech, to build up a pipeline of young talents to grow and sustain the industry.

SECTION 3

PHASE 2: THE EMERGING THEMES

What were the emerging themes in Phase 2?

PHASE 2 OVERVIEW

Following the conclusion of Phase 1 discussions, SFA invited participants to continue the LCKMP engagement journey with us and further contribute their ideas in Phase 2 of the Stakeholder Engagement series.

The three sessions, which spanned over the month of July 2021, were designed to allow participants to deepen the discussion of key themes drawn from the earlier conversations in Phase 1. Mr Desmond Tan, Minister of State for Sustainability and the Environment, joined the discussions, which involved about 150 stakeholders from different professions, industries and backgrounds.

Participants deliberated over how LCK could be redeveloped into Singapore's flagship agri-food production hub of the future that is vibrant, innovative, sustainable and accessible to all, based on the following five themes which had emerged in Phase 1:

- The industry and the ecosystem
- Climate resilience and sustainability
- R&D, education and training
- Attractiveness, vibrancy and accessibility
- Branding of LCK and putting SG on the map

Participants were also asked to describe the future opportunities in greater detail, guided by the following:

- What are the values and benefits of this theme?
- What do we need to make this theme a success?
- What kind of expertise/resources/capabilities are needed?

Discussions around these questions helped participants surface potential tensions within the system, and to consider trade-offs between the different outcomes.

(1) INDUSTRY AND THE ECOSYSTEM

Participants wanted greater sharing of facilities, infrastructure, knowledge and information between the industry and the wider ecosystem. They reiterated the importance of community involvement, as LCK could be a place that connects community farmers and home growers to the wider agri-food ecosystem.

For participants, success meant:

Singapore renowned for our global leading practice in urban farming with shared facilities and smart infrastructure.

To develop LCK into a global centre of excellence for agri-tech and urban farming, participants proposed the development of shared facilities and smart infrastructure. The introduction of such premises could encourage collaboration, enhance productivity and logistics, as well as reap economies of scale. Smart infrastructure and shared facilities not only help to anchor the location, but also reduce costs of production for the players. A benefit from such a sharing arrangement could be in the reduction of food wastage and shortened delivery time/effort to reach end consumers.

Support needed:

Government as the enablers rather than just regulators

There are multiple hurdles that a farmer/ producer needs to go through while setting up a new farm as there are different types of licences one should apply for, guidelines to adhere to and paperwork to go through.

Shifts in mindset from competition to collaboration

The design of the grant application can provide guidance for applicants, and encourage ecosystems to work together rather than just helping individual companies. There is also a need to work on business models and provide finance for investments.

A unified ecosystem

Participants also recommended greater synergies between the future LCK and neighbouring precincts like the upcoming Agri-Food Innovation Park in Sungei Kadut and Tengah Town, such that a wider agri-food ecosystem could be developed. These should be thought through holistically so that each plan and its stakeholders can start interacting with each other in terms of physical, economic and knowledge flows.

Build a LCK identity and common values that unify the various players

Participants shared consensus that LCK should be a place to build symbiotic relationships between different industry players and the wider community, which would give rise to more knowledge sharing and collaborations to further strengthen our food security. There can be a unique LCK identity, with respect for diversity and room for various players to share information and are rewarded for collaboration and exchange.

Possible tensions and considerations:

- Existing farmers who are unwilling to keep up with the change but still producing high yields might be reluctant to modify their business models. Some could be lacking in expertise to do so.
- Producing for locals might be compromised if the focus shifts to producing for the region.

(2) CLIMATE RESILIENCE AND SUSTAINABILITY

Participants stressed that climate and the environment should not be an afterthought — farming and the environment should not be seen as separate and conflicting but complementary.

For participants, success meant:

A sustainable ecology building on LCK's and Singapore's natural assets

The LCK area is surrounded by mangroves, a nature reserve and rich biodiversity, which should be taken into consideration as it is master planned into a sustainable agri-food hub. Research into food crops native to Singapore and farming methods appropriate to our climate can be prioritised.

Support needed:

Measure impact and show progress in sustainability

Having metrics is a way to measure success. As more organisations use the Environmental, Social & Governance (ESG) framework to measure their efforts to be a sustainable business, LCK should use this to show the positives backed by accountability. It's not just about tracking yield as a measure of success; other aspects, such as carbon sequestration, can also be tracked to measure success.

A sustainable hub for circular activities

Creating an ecosystem that adopts circular economy principles that minimise waste would be critical for the future LCK. The aim would be to achieve an end-to-end zero waste model, such as through the use of renewable energy sources and reusing farming waste. Participants emphasised the importance of collaboration between producers of raw materials, farms, manufacturers, restaurants and consumers, in developing LCK into a sustainable hub for circular activities.

A food forest that can produce food while preserving natural habitats

LCK can create a positive force for the environment while growing our crops. This means balancing high-tech food production against some nature-based farming approaches that preserve and possibly enhance the area's biodiversity. LCK should not just aim to be carbon neutral, but climate positive.

Possible tensions and considerations:

- Lower-yield farming methods could be better for climate resilience but may not produce enough volume to strengthen our food security and contribute to our '30 by 30' goal.
- Growing crops may impact natural ecology, e.g. introducing new invasive species, especially if they are near the nature reserve or generating waste harmful to the coastal ecosystem. There needs to be a discussion on how much buffer are we providing for the nature reserve.
- The mitigating measures do not always guarantee savings or a net positive effect on the environment.

(3) R&D, EDUCATION AND TRAINING

Participants agreed that LCK has the building blocks necessary for it to become an R&D hub for tropical agriculture.

For participants, success meant:

R&D hub for tropical agriculture

This hub could build on our in-depth knowledge of agriculture in the tropics and encourage R&D in agri-tech that would support Singapore's agri-production. For example, LCK could be a source of data collection on tropical agriculture and a space for farms and Institutes of Higher Learning (IHLs) to conduct trials or discussions on farming technologies. The findings could be shared with current and future players and communities.

An international research and ideas exchange hub

Participants proposed that IHLs set up research facilities within LCK, with collaborations and partnerships with international institutions such as Wageningen University from the Netherlands. This would add an international presence and a global exchange of ideas to build LCK into a world-class agri-food hub.

A pipeline of talents and youths graduating from established institutions offering well-developed curriculums

Participants suggested that LCK be an attractive agri-food hub with opportunities to attract a healthy pipeline of youths to join the farming industry. It would also be an agri-food hub with networks of shared knowledge between those with farming experience and others more familiar with advanced agri-tech. This cross-pollination will enrich LCK and our knowledge of urban agriculture.

Support needed:

Forming networks of shared information and knowledge

The LCK Hub can provide platforms to share knowledge on both conventional farming methods and modern ones. This would help to debunk myths about the industry and provide candid sharing between those with experience and those who are more familiar with technological advancements in the field.

Research is supported by funding

Research is currently very reliant on research grants. It limits how much is being done and are not easily translatable to actual results. Some groups are doing part-time research because they do not have funding.

Possible tensions and considerations:

- The agriculture industry will have to be willing to work together and be open to sharing knowledge instead of operating in silos. There needs to be a deliberate collaboration amongst different farms and technology companies for this to be successful.

(4) ATTRACTIVENESS, VIBRANCY AND ACCESSIBILITY

Participants discussed different ways for LCK to be a destination for more people to visit.

For participants, success meant:

LCK as a restorative and rustic oasis

Participants recommended that LCK be developed into an attractive and vibrant destination to enable work, learn and play, with some parts retained as a restorative and rustic oasis. These parts could serve as a buffer zone to allow society and nature to co-exist with the production spaces.

Easier access to LCK

Participants reiterated that the accessibility of LCK must be enhanced, such as improved vehicular, cycling and pedestrian infrastructure and public transport service (trains, buses, electric vehicle sharing, autonomous vehicles, boat rides) to facilitate the movement of workers in the area and logistics for distribution. The modes of transport could move towards being carbon-light and shared, but still capable of bringing supplies in and out of LCK.

Support needed:

Understanding and documentation of the heritage of the area

LCK is a space where people learn about the past. For example, why the area is so named and how the place has evolved should be documented.

Adequate and proper planning of transport in LCK

Participants have mentioned that it is currently unsafe for buses to come in as LCK roads are long and winding. When the place is developed for visitors, the overall transport infrastructure (roads, electric charging points, bus stops) and services will need to be planned to accommodate it.

A destination for the farming community and public engagement

LCK could be developed into a destination to educate people about the attractiveness of farming so that the larger community can recognise the importance of our local produce for the long term. To educate the public on local farming, a food museum could be established. It could showcase our rich agri-food history and curate activities and workshops for the public to better appreciate farms and understand what goes into growing local produce. In tandem, commercial facilities for the public to buy and eat quality fresh produce were suggested for incorporation into the overall LCKMP.

Possible tensions and considerations:

- Balancing vibrancy vs rusticity. As more people visit LCK in future, rustic quiet spots may be lost. A possible solution is to retain some spaces for 'quieter activities' like photography.
- Trade-off between production and presenting an entertainment experience for people. Farms do not like visitors coming in but have to accommodate some visits to allow for agri-tourism. In addition, visitors bring pathogens harmful to the produce. Farmers may also be limited in resources and ideas to run these programmes.

(5) BRANDING OF LIM CHU KANG AND PLACING SINGAPORE ON THE WORLD MAP

Participants agreed that to brand LCK and local produce, more public education could be done to enable better appreciation of LCK farmers and their produce.

For participants, success meant:

Showcasing Singapore's innovation through food

Singapore cannot compete in scale but can compete on uniqueness. There is opportunity to develop niche and innovative offerings, such as seeds, that are unique to Singapore or produce that is exceptionally high value.

Support needed:

Quality marks and certification

There can be a certification for food to showcase the quality and nutritional value of our local produce, just like the USDA ORGANIC branding that adds value and lends credibility. This could also be used to brand our local produce to provide a much needed edge domestically and also internationally when exporting.

Possible tensions and considerations:

- Balancing between exporting our produce and consuming the produce locally. While exporting may provide producers additional financial viability, the goal is to provide Singapore with greater food security.
- There will also need to be more explicit linkages on how branding ties back to our local food security needs.
- Growing and researching a uniquely Singapore produce is capital intensive. It may have to start as a proof-of-concept first. There are also various views around genetically modified foods vs traditionally grown foods.

SECTION 4

PHASE 3: PROPOSALS FOR THE FUTURE

What did participants advocate in Phase 3?

PHASE 3 OVERVIEW

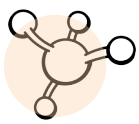
In Phase 3, 54 highly engaged participants were selected to form five groups to develop more concrete proposals for the future of LCK.

Each group considered one of the four 'Es' (Economics, Experience, Engagement or Environment) of the LCK ecosystem. The participants joined the group discussing the topic that appealed most to their interest.

Over the course of four virtual and physical workshops, these groups iteratively refined their ideas and analysis, before presenting their proposals to the Minister for Sustainability and the Environment, Ms Grace Fu, and Minister of State, Mr Desmond Tan, at the final session on 30 October 2021.

This report provides a summary of the proposals* presented.

Group proposals



1. Economics 1

The little green dot – a vision for an integrated, high production precinct

2. Economics 2

Infrastructure and shared services to reduce costs and grow LCK

3. Experience

A collective farming community for a more resilient food system

4. Engagement

Getting in the mood for Singapore's food – engaging the community

5. Environment

A holistic approach towards a resilient and regenerative food system

*All maps, plans, images, data produced and presented were obtained by participants through their own means with the sources credited.

Economics 1:
The Little Green Dot Vision

Team members: Masahiko Yamada, Roshe Wong, Dr Godge Mandar Radhakisan, Lau Chuen Wei, Dr Farshad Shishehchian, Dr Gary Ng Sum Huan, Phoebe Xie Xinyi, Koh Chern Peng, Daniel Lai, Tan Chun Heng Chester

The vision

A high-tech, vertical and integrated tropical food production hub designed for energy efficient sustainable production, translational research and technology commercialisation.

SG

The Little Green Dot
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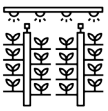
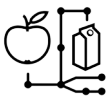
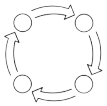


Land use optimised with vertical stacking in an integrated precinct



Efficient co-location of shared value chain services



Enabling circular flows and renewable energy

Secure conservation of seeds on behalf of the region

Applied research on target species

Fostering an innovation ecosystem at LCK

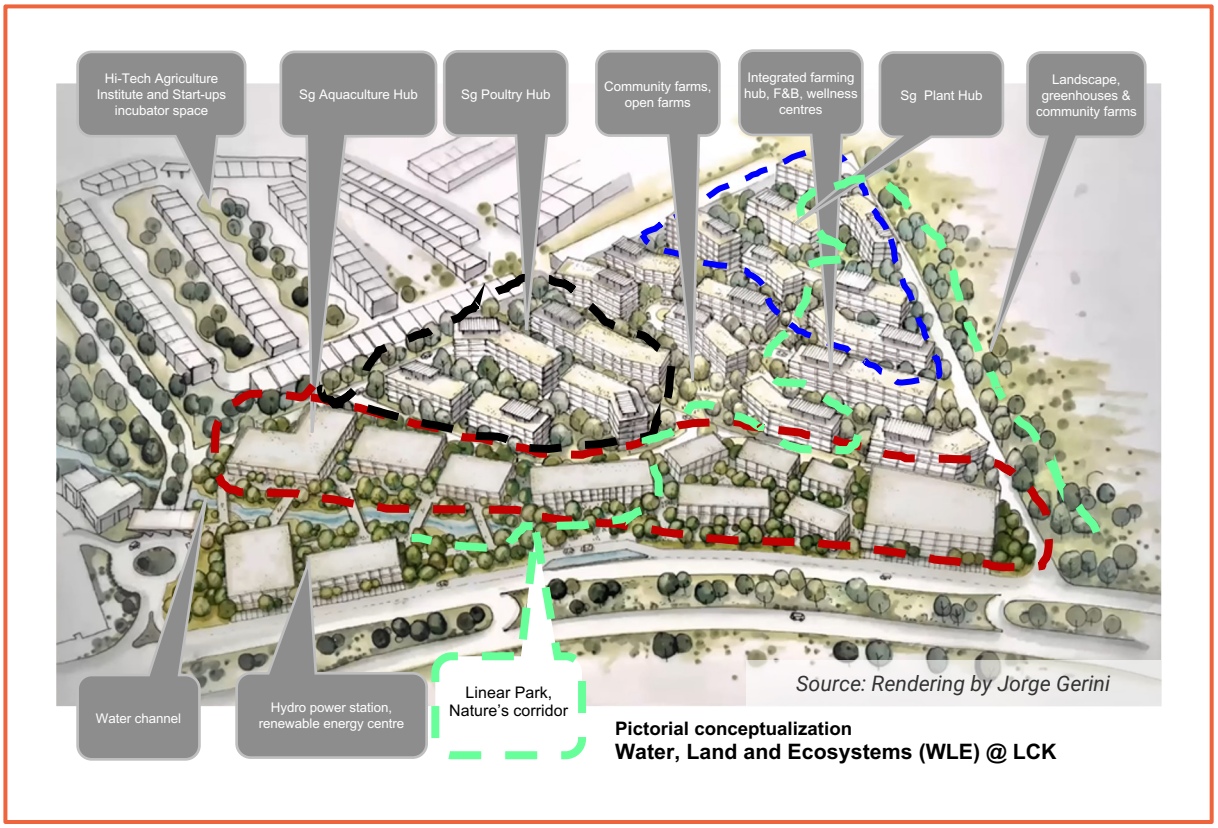
Key features:

(1) An integrated and connected precinct for agri-tech

Sg Plant Hub – High throughput plant factories for indoor crops, rooftop farming, plant R&D centre, test bedding tech for farmers, germplasm centre, innovation and enterprise hub for farm to fork concept.

Sg Fish Hub – High throughput aquaculture farms, rooftop outdoor aquaculture/aquaponics farming, fish R&D centre, test bedding tech for farmers, fish broodstock and germplasm centre, innovation and enterprise hub for farm to fork concept.

Sg Poultry Hub – High throughput chicken farms, rooftop outdoor/open culture farming, R&D centre, test bedding tech for farmers, germplasm centre, innovation and enterprise hub for farm to fork concept.



Integrated precinct design to promote social, ecological and operational connectivity

Land use can be as follows:

- 20% roads and infrastructure
- 50% high-tech farm (vegetables, eggs, fish, chicken etc, determined by local players)
- 30% common services, education and R&D centres

(2) Stacking and co-locating for optimised production

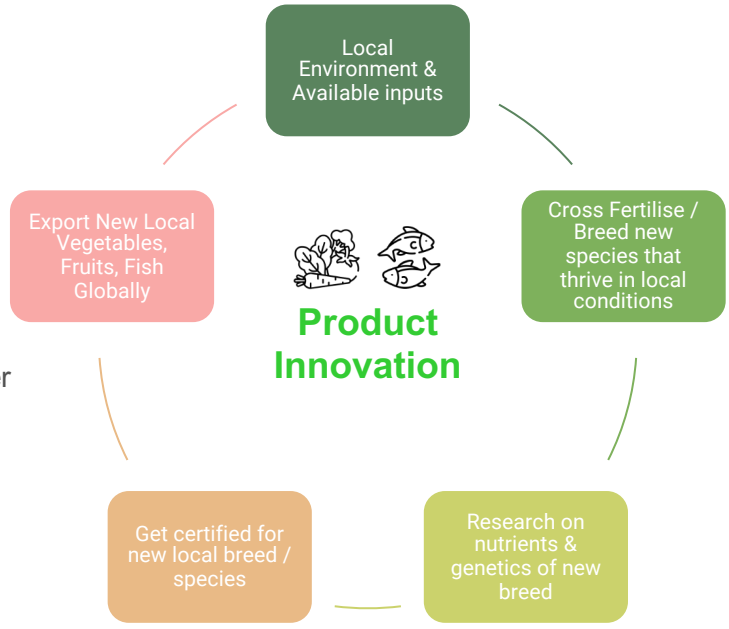
- Combining intensive vegetable cultivation with aquaculture for mass and higher-end markets [rooftop and facade for mass-market vegetables and indoor enclosed plant factories for higher-value produce]
- Natural ecosystem with aquaculture in reusing waste materials as input materials
- System providers can lease to aspiring new and younger farm entrepreneurs to lower financial entry barriers
- Shared facilities such as nurseries, storage, waste recycling, water treatment to reduce the capital and operating expenditure of farmers
- Centralised sales and distribution services for produce to reduce logistics cost and wastage
- Showcase and sales platform for agri-tech solutions firms ranging from equipment and tools (hardware), software, material and consumables suppliers as well as service providers
- Associated sustainable and green solutions firms that have relevant application to agri-food sector

A multi-storey mixed-use building housing multiple functions

- Seed bank for genetic material
- Applied research & development labs for plant and fish breeders with onsite collaboration for direct experimentation and trials
- High-value produce such as herbs, medicinal plants, functional or nutraceutical vegetables, strawberries and high-end freshwater fishes and crustaceans
- High-value processed products such as high-pressure pasteurised juices, salad bowls and pre-mixed soups
- Food manufacturing arm providing original equipment manufacturer (OEM) packaging and processing services

(3) Research and development focus around target species

- Tropical food production hub – boost production to contribute to 30 x 30 goal
- Conservation of seeds comprising genetic material of importance for food and agriculture for Singapore and the region
- Creation of an on-site innovation ecosystem, enabling the export of technology to the region, becoming the ASEAN lead for R&D and technology transfer
- Connection to institutes of higher learning (IHLs) to connect to the broader Singapore innovation ecosystem
- Research outcomes to include:
  - Genetic improvement
  - Pest and disease resistance
  - Nutritional density
  - Domestication of target species
  - Localised culture system



(4) The enabling environment

Feasible land characteristics

- Longer land lease (e.g. 30 - 40 years) for investments to have more certain & longer runway to recover capital
- Land shape (squarish and efficient layout) to reduce land wastage for farmers
- Optimal spatial planning & land usage

Ready-to-build infrastructure

- Provide pipes to easily tap and use essentials for automation & smart farms:
  - Power supply
  - Water supply
  - 5G internet network
  - Waste management
- Provide infrastructure for logistics and human resource:
  - Accessible transportation
  - Wide roads
  - Covered connection to all buildings/places in LCK

Faster construction

- Special waivers for faster & more efficient approvals to help speed up construction
- Grants, incentives & common services to help farms meet standards for safe, clean, healthy, good produce (LCK Food Quality) through R&D and technology advances

Self-regulating greenhouses/building

- Building mechanisms and machineries to ensure optimal consistent environment for the farm crops e.g. vegetables/fruits/fish
- Localised smart & sustainable buildings for growing conditions needed for food production in Singapore and cities

Automation/unmanned process

- Robotic friendly infrastructure to enable robots to be developed & move about LCK freely and easily
- Attract the next generation in technology, engineering, agriculture industries
- E.g. Amazon and Alibaba warehouse robots can help to do unmanned processing & moving of logistics 24 by 7

"Your output is my input, vice versa"

- Complement goods & services from R&D institute Researchers → Fertilisers/Energy providers → Farm agronomists → Technologists/Engineers → Logistics providers → Consumers → Tourism/F&B providers in LCK
- Creating sustainable economy in LCK

Benefits and considerations

Benefits of the proposal

Reduce costs & barriers to entry

Economies of scale lowers farm input costs

Automation & machinery lowers resource costs

Government support lowers development costs

Increase yield, revenue, investments & quality

Attract global players & investments

Increase local expertise exponentially

Become a quality brand & export expertise globally

Challenges to be addressed

- Existing farms are still producing food; loss of some local food production during construction
- Longer lease means land use allocated to remain as is and no change until end of lease
- Pricing of agricultural land that is proportionate to development charge on food-processing area
- Due to squarish land being more desired, there could be unused odd shape pieces of land area left
- High capital investment & time to construct the extensive ready-to-build infrastructure
- Balance and diversity of staff employed (import vs local workers & talents)

Economics 2:
The Shared Infrastructure and Services Vision

Team members: Dr Lim Boon Whatt, Chew Chee Bin, Philip Gu Huanqing, Robert David Hulme, Oh Puay San, Darren Tan Sijie, Lan Yi Chieh, Wang Wei

The vision

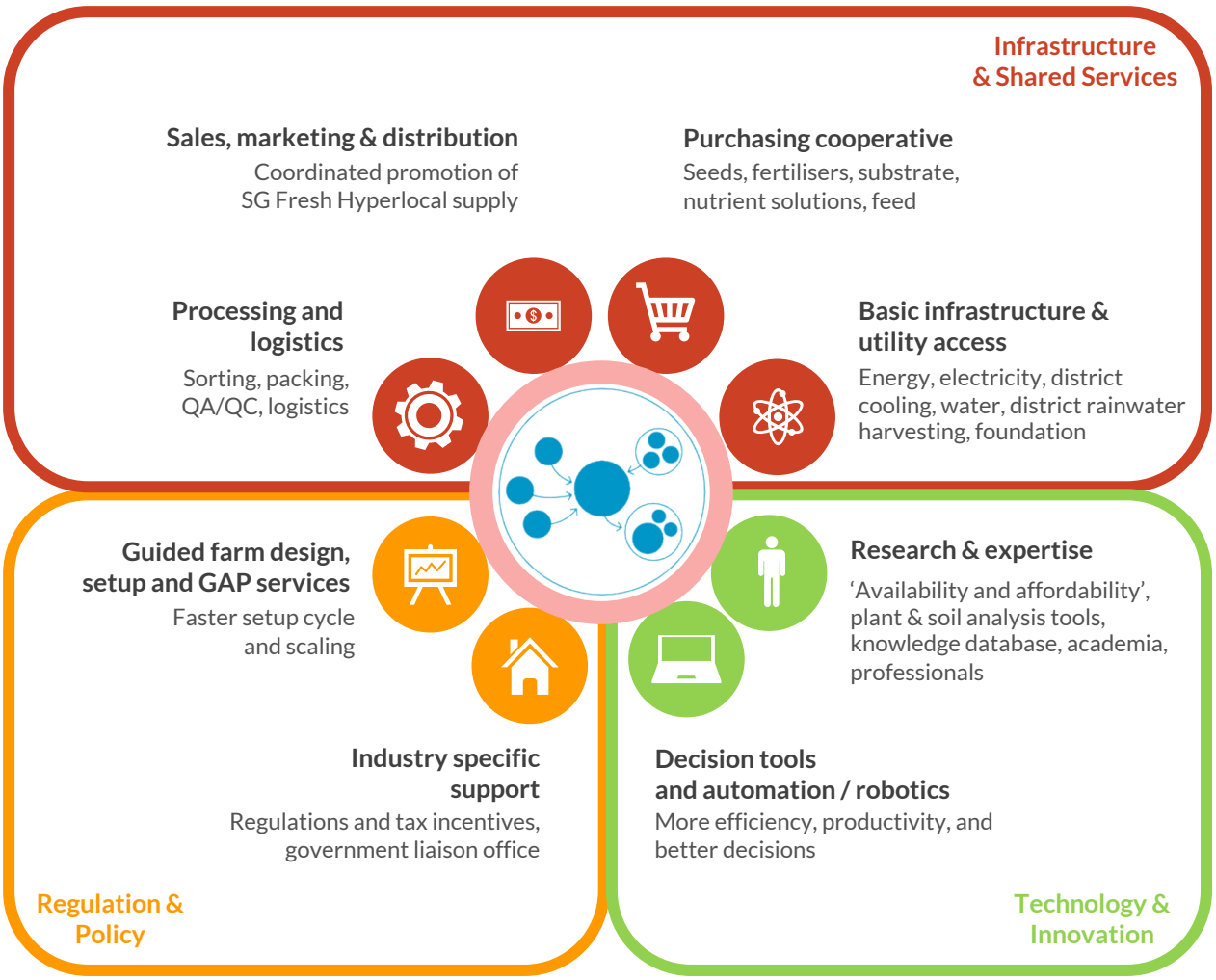
To grow more, with less, sustainably

Building capability and capacity

Investing in shared infrastructure

Reducing regulatory hurdles

Growing profitable growers



Proposed Ecosystem: 3 core parts

Key features of the proposal

Economics 2 provided two approaches for economic viability. The first is a 'hawker centre' model promoting knowledge and facility sharing for smaller growers (similar to a co-op model). The second is an agri-food tech hub for multinational corporations (MNCs).

'Hawker centre' model

Plug and play model
Strong centralised facilities
Launchpad for SME growers

Agri-food tech hub for MNCs

Innovation
Investment
Infrastructure

Industry reg. and policy support

- Industry-specific regulations and incentives
- Farm design, setup & GAP
- Government liaison office

Infrastructure and shared services

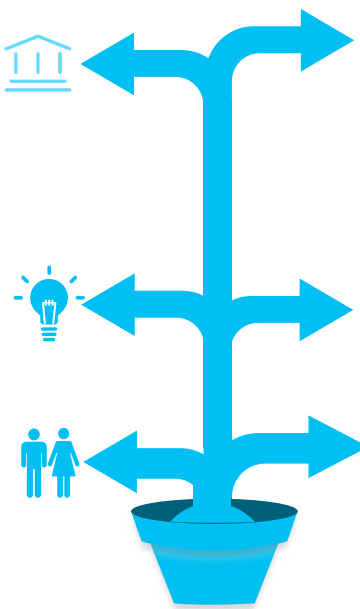
- Basic foundation, power & water
- Agri-inputs purchasing
- Processing & logistics
- Sales & marketing

Technology & innovation

- Research and expertise
- Decision tools and automation
- Waste & circular economy

Expected benefits of proposal

The proposal envisioned a government-backed, industry-led centralised body and model that creates a vibrant economically viable industry of big and small producers with the following benefits:



GOVERNMENT

- Optimise resources across various government agencies
- Generate new economic value
- Create new jobs and entrepreneurs for NextGen of local talent
- Achieve 30x30 goal for SG food security

INNOVATORS

- Build new solutions and services
- Improve production and processing efficiency

CONSUMERS

- Competitively-priced, nutritious and fresher local food sources

GROWERS

- Reduce barrier to entry and time to market
- Create a commercially sustainable, price competitive generation of SME growers
- Allow growers to grow without distractions from non-core activities
- New attractive job opportunities

INVESTORS

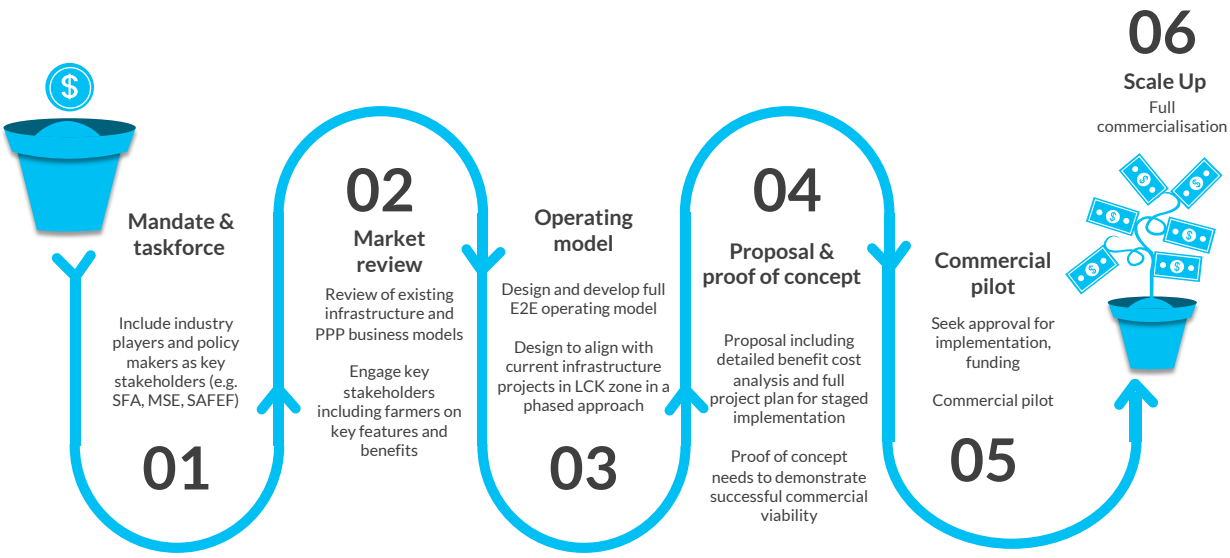
- Profitable impact investment and capital in food, innovation and growth

RESEARCHERS

- Continuous & collective data/knowledge base
- Applied R&D with new solutions to solve challenges in the field

Implementation considerations

Objective: Develop a proof-of-concept operational model for the commercialisation of a shared services facility, with a taskforce including key industry stakeholders and government agencies.



Experience:
The Unified Culture Vision

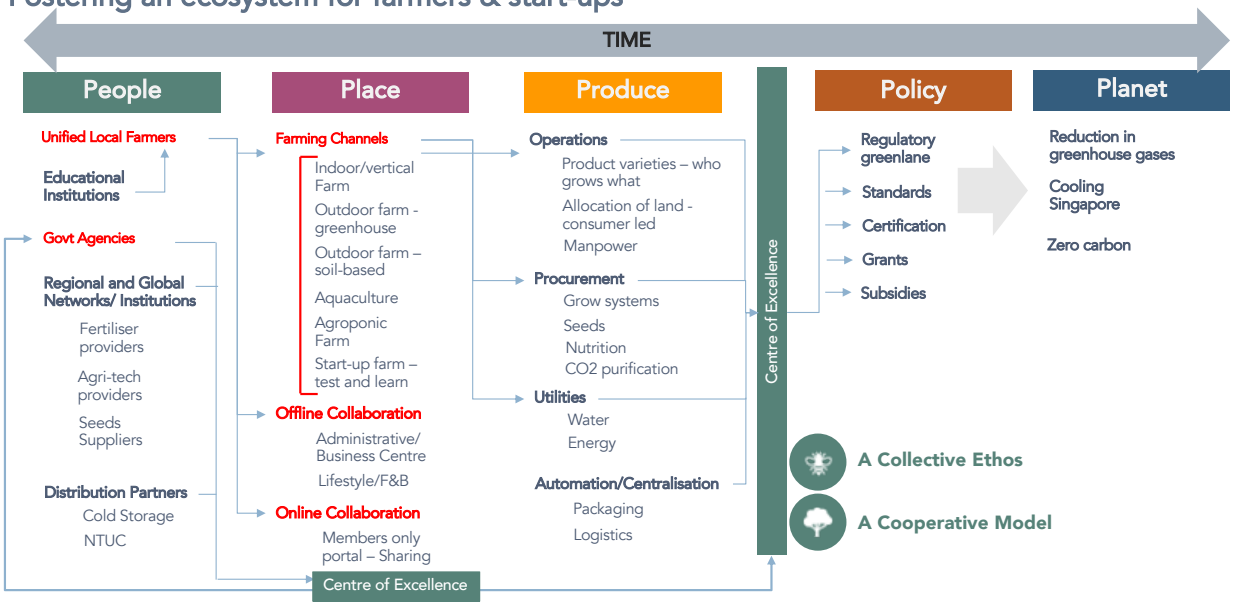
Team members:
Dr Loh Siaw Ee, Han Ping Ping, Benjamin Yap Whee Kiat, Benjamin Swan, Murugesan Sethu, Melissa Yip, Chintan Anil Raveshia, Teh Hock Beng Michael, Alexys Tjhia Lie Ting

Vision	A collective farming community for a more resilient food system in Singapore			
Mission	To foster a collaborative ecosystem between farmers and build an ecosystem that joins the global farming community and related stakeholders.			
Cultural Pillars	Socially responsible	Progressively minded	Built on deep relationships	Trusted for the long term
Cultural Values	Honorable	Enterprising	United	Committed

Cultural values expanded

Honorable – Treat our fellow farmers with respect and integrity, putting truth before our own comfort, and doing our best to deliver on promises.
Enterprising – Brave enough to try new things to increase capabilities, and open to receiving ideas to improve upon the status quo. To be energised by a 'can-do' attitude
United – Draw from each other's strengths and create power. Unity is the strength that enables progress. Unity is also empowerment to scale new heights.
Committed – Committed to the tasks at hand no matter the effort. To celebrate each others' successes, but most importantly to support one another through failures. Through our cultural values, we are committed to making a more resilient food system in Singapore.

Fostering an ecosystem for farmers & start-ups



Ethos and model

A collective ethos

The collective will be led by a diverse council by and for the farming community.

The intention is to align and build up the next generation of farmers, underpinned by common values such as trust, collaboration and open communication.

The collective may form workgroups to engage the broader farming communities in Singapore, government agencies as well as connect with regional/global groups.

A cooperative model

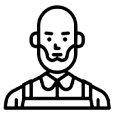
Members of the collective may also come together to organise themselves under a cooperative model to integrate resources, share common costs and returns.

Such an operating model may serve the common interests of LCK farmers and support a variety of farming related activities such as certifications, branding, grow systems, methodologies and best practices.

Resources such as centralised facilities, infrastructure, branding, procurement, distribution and others may also be integrated under a cooperative model that appropriately allocates risks and returns.

Differentiated user journeys for stakeholders

As part of their proposal, the Experience Group envisioned future journeys through LCK which the collective will cater for different stakeholders:



1 Transient expert

(focus on technical experts)
3-month journey

LCK Collective offers me a chance to:

- Get matched with existing farming teams who require my knowledge/expertise and have an opportunity to apply them within LCK
- Attend industry sharing sessions so I can identify potential future partners
- Stay connected via global network so I can keep updated with updates/happenings

2 Farmers residency

(focus on individuals and startups)
6-month journey

LCK Collective offers me a chance to:

- Receive hands-on industry training and know-how via a short-term residency
- Engage with industry experts via the Centre of Excellence to test and refine my POC
- Engage with network and potential business collaborators via the LCK network

3 New farmers

(corporate/institution driven)
3-to-5-year journey

LCK Collective offers me a chance to:

- Establish a recognised and trusted foothold within the Southeast Asia/Asia Pacific region for my organisation's fiduciary responsibilities and senior management setup
- Localise my organisation's competencies to the region as a Singapore farm is established as a hub for subsequent regional expansion
- Hire professional talents to lead, manage, espouse best practices locally and into the Southeast Asia/Asia Pacific region

Planning considerations

- High intensification vs mixed-purpose plots
- Provide mixed-purpose plots along social - accessible/tourism route
- Zones for closed loops
- Diversity of agriculture types for resilience (soil-based, high-tech, chickens, fish, plants etc)
- Incorporate in masterplan spaces for nature buffers and measures to mitigate/treat environmental pollution and impacts from agri-tech
- Infrastructure and visitor-ship impact.
    - Activate 2 nodes - one is social / public facing and the other is industry focused
    - Infrastructure network to deconflict roads for farm production (logistics, heavy vehicles on roads) and roads for social/tourism (pedestrians, autonomous vehicles, car-lite etc)
- Create spaces for production, spaces for experimentation
- Create some residential spaces to foster farmer collective (e.g. co-living)

Engagement:
The Customer Demand Vision

Team members: Kenny Eng, Tammy Ng Shi Ming, Ma Chin Chew, Malcolm Ong, Anton Wibowo, Matthew Robert Howe, Suzanna Tang

The vision

A Thriving Food Region where everyone can immerse in & co-create the Singapore Food Story.

iconic

interactive

fun

educational

inviting

Key features:

A sprawling agri-hub at LCK featuring:

Seminars and events

Spaces for seminars and events to connect the community

Heritage and visitor centre

Easy access to farms and food production space

R&D and startups

A conducive environment for research and new startups

F&B

Food from available to eat, farm-to-plate

Year 1 & 2

Pop-up style outreach into the Singapore community to attract interest in LCK

>

Year 3 & 4

As new farms are established, start to invest in the visitor experience on-site to bring in people to LCK

(1) Agri-box pop-ups in Year 1 and 2

Over the next two years, it is proposed to have 3-4 agri-box pop-ups a year.
These pop-ups will bring together existing stakeholders in the agri-food tech and sustainability space to engage with the wider community and to enhance experiences and offerings as a collective.

The goals are:

Raise awareness

Raise awareness of local food producers and our Singapore Food Story

Build a community

Build a community of local agri-food supporters by providing opportunities for farmers and producers to interact with the community

Increase sales 30 by 30

Generate sales, engage customers and get feedback

- Decentralised pop-ups around Singapore to showcase the fun and exciting features & places of LCK to the public

- These include:
  - Showcase and sale of urban farm produce
  - Showcase of technologies in the agri-food space
  - Cooking demos on how to prepare our local produce
  - Etc.

- May include providing free transportation to LCK area as an extension to the pop-up

(2) Visitor's Centre in Year 3

By Year 3, many of the new farms would be ready for production and farm visits.

Learning from experience of the pop-ups, an Agri-Hub Visitor's Centre can then be built.

The Visitor's Centre can be a semi-permanent focal point for exploring the LCK region and include an array of activities by our local food producers and stakeholders in food security and sustainability.

Community building will be built through events, fun, food and educational activities to strengthen the connection between farmers and public. After LCK is brought to the community in Years 1 and 2, the community will then be brought to LCK from Year 3.

Implementation considerations

High costs have always been a challenge for our local food producers. The success of the agri-box pop-ups and Agri-Hub Visitor's Centre will depend on whether the LCK stakeholders prioritise collaboration over competition. Everyone has to come together for a common goal to ensure the sustainability and continuity of such events and outreach.

Moreover, going digital and having to move out of their comfort zone towards becoming more high-tech may be a challenge for some of our farms, which have been around for a very long time.

The group suggests looking into creating a fund specifically for food producers and organisations to tap on to engage the public. Ideas the fund could support include:

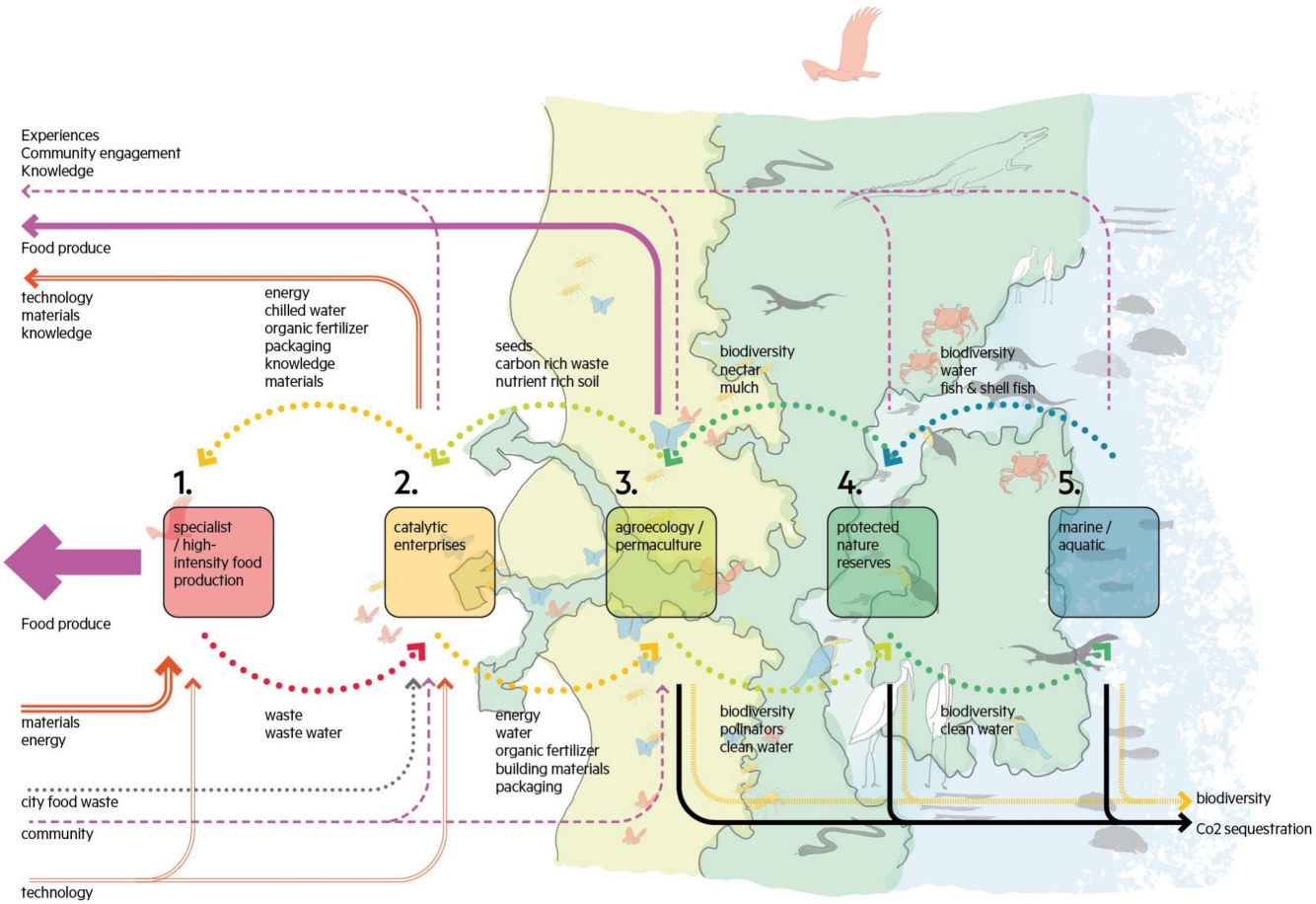
- Mobile farmers' market bringing together local produce and home-based businesses
- Food bus to various farms to cook "Freshest of the Fresh" produce
- Facebook Live market
- Cooking contest over social media

Environment:
The Resilient And Regenerative Vision

Team members: Dr Lau Chin Leon Lionel, Toby Kyle, Pavarne Shantti Sivalingam VM, Dr Jani Tanzil, Roc Koh Chit Song, Ruan Lim Whei Lei, Seah Zi Quan, Koe Loong Chen Marcus, Oh Wee Khoon

The vision

LCK to be the new model for sustainable and resilient food production that grows with nature, balancing food production and environmental care for the long-term.



Proposed zones and circularity loops between systems

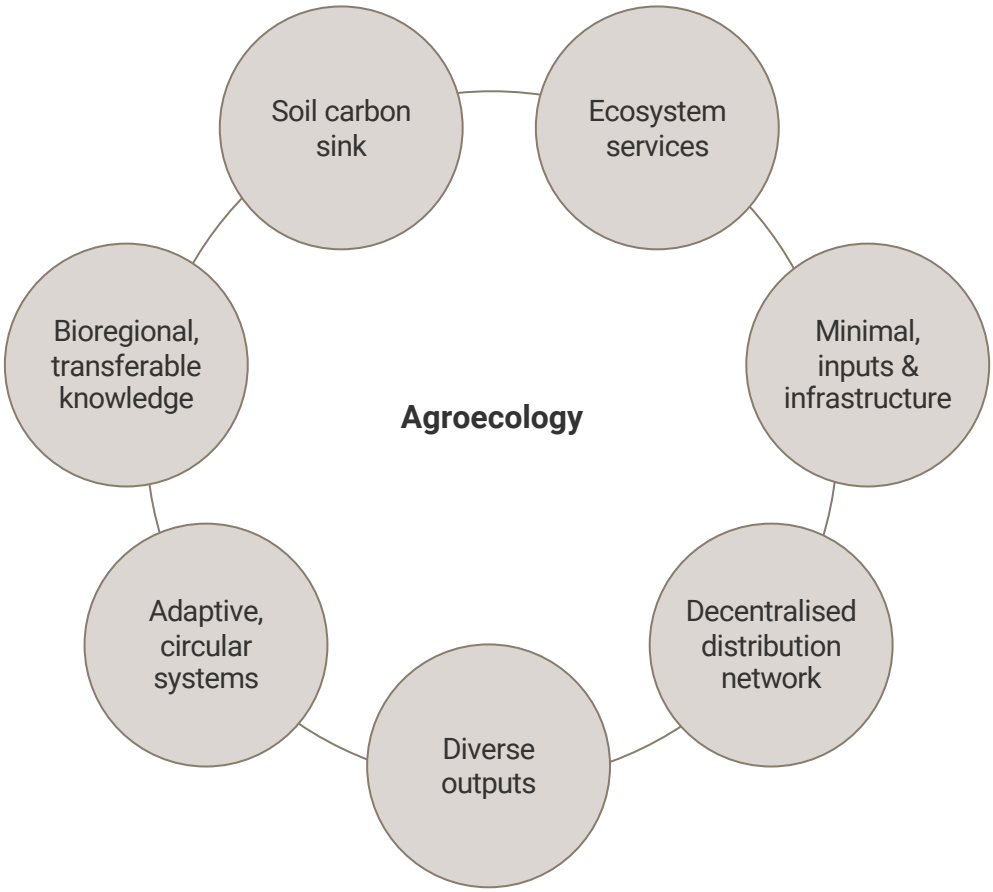
Key Features:

(1) Agroecology

Connecting food, people and nature

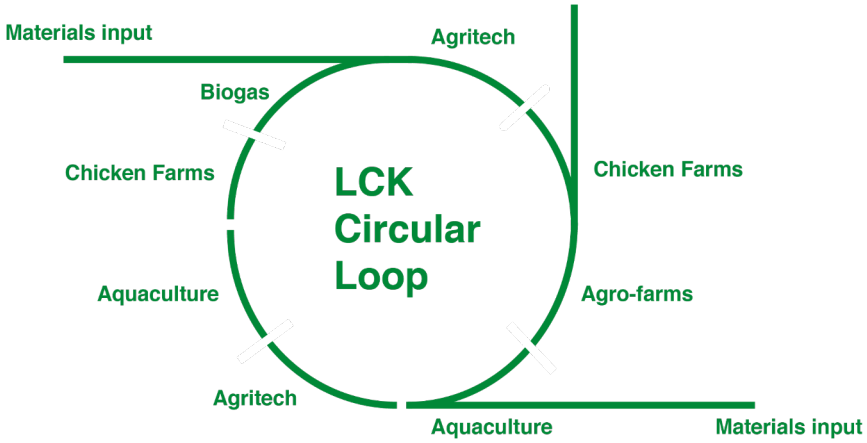
Model systems:

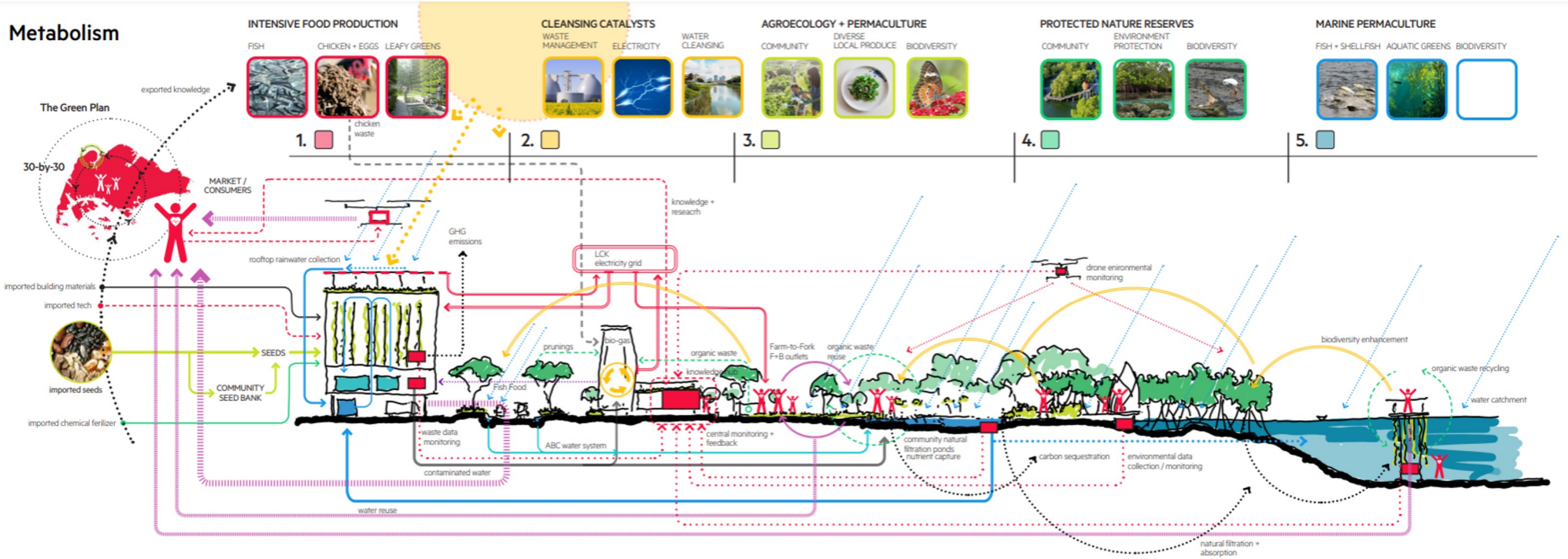
- Permaculture Design
- Agroforestry
- Regenerative Agriculture
- No-till Market Garden
- Integrated Polyculture
- Small-scale farms



(2) Catalytic enterprises

As part of the LCK ecosystem, apart from the food production industry, there should be catalytic enterprises that can help connect and close the circularity loop. For example, a composting facility within LCK that can help compost waste to fertilizer and energy etc.




Metabolism
INTENSIVE FOOD PRODUCTION
FISH
CHICKEN + EGGS
LEAFY GREENS
CLEANSING CATALYSTS
WASTE MANAGEMENT
ELECTRICITY
WATER CLEANSING
AGROECOLOGY + PERMACULTURE
COMMUNITY
DIVERSE LOCAL PRODUCE
BIODIVERSITY
PROTECTED NATURE RESERVES
COMMUNITY
ENVIRONMENT PROTECTION
BIODIVERSITY
MARINE PERMACULTURE
FISH + SHELLFISH
AQUATIC GREENS
BIODIVERSITY
1.
2.
3.
4.
5.
exported knowledge
The Green Plan
30-by-30
chicken waste
MARKET / CONSUMERS
knowledge + reseacrh
GHG emissions
rooftop rainwater collection
LCK electricity grid
drone enironmental monitoring
imported building materials
imported tech
SEEDS
imported seeds
COMMUNITY SEED BANK
imported chemical ferilizer
prunings
bio-gas
organic waste
knowledge
Farm-to-Fork F+B outlets
organic waste reuse
biodiversity enhancement
organic waste recycling
water catchment
Fish Food
waste data monitoring
ABC water system
central monitoring + feedback
community natural filtration ponds nutrient capture
carbon sequestration
environmental data collection / monitoring
contaminated water
water reuse
natural filtration + absorption

(3) The LCK standard for sustainability

Connecting data, knowledge and the environment

Setting high standards and guidelines for:

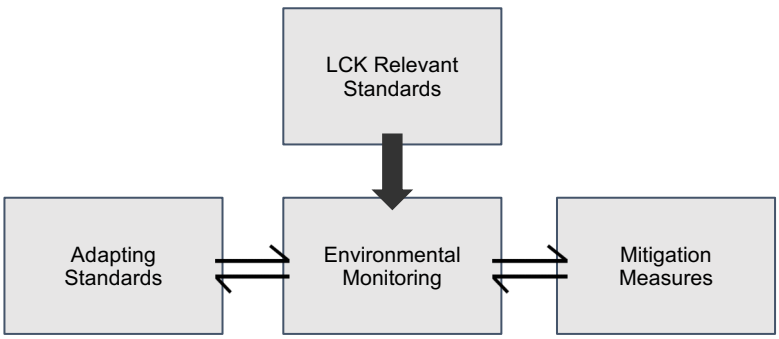
a) Development

b) Operations (for agri-tech & agroecology & catalytic enterprises)

c) Environmental management and monitoring (EMM)

Resiliency in standards: A simplified adaptive management approach

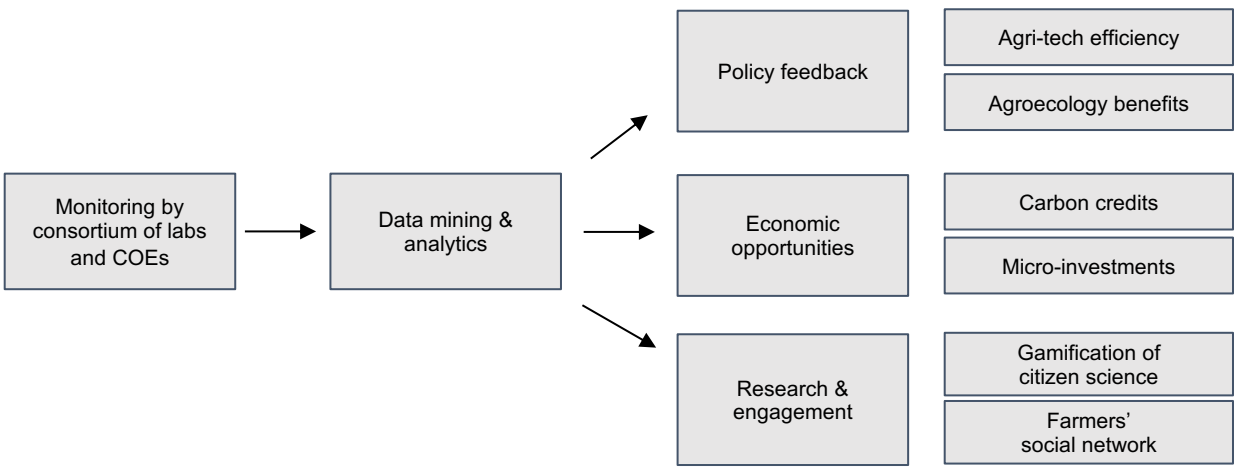
Feedback loops to advise future management strategies taking into account uncertainty of climate change impacts and other environmental disturbances



Adaptive management of ecosystems and environmental commons

Centralised information hub (e.g. waste, environment data, carbon) that promote transparency and accountability

It is envisioned for a consortium of labs and Centres of Excellence to conduct environmental monitoring. The various data sets could be linked together to reveal new insights for policymaking, economic opportunities, and for research and engagement. With data, informed policy decisions can be made for agri-tech and agroecology. New economic opportunities can also be discovered, such as a LCK carbon credit exchange for corporations, and community credits such as BulohCoin to introduce public micro-investments and make Singaporeans stakeholders. In the future, the introduction of this financial layer could ease the costs of the infrastructure and create buy-in in the community for local produce and our natural heritage.



SECTION 5

SUMMARISING THE VISIONS

What is the collective vision for the future LCK?

A COLLECTIVE VISION FOR THE FUTURE LCK

THE VISION

Over the next decade, LCK will become an agriculture, food and technology ecosystem that incorporates:

Commercially viable production

Increasing agricultural and nutrition output to help contribute to the '30 by 30' goal

Innovation in operations

Connecting technology and agriculture for innovation, to support other outcomes

Environmental Sustainability

Maintaining the ecological resources of the site over time, for long term sustainability

Resilience through diversity

Ensuring the site is adaptable to economic and ecological shocks through sufficient diversity

Affordability for consumers

Keeping costs and therefore prices low, so that consumers can benefit from affordable produce

New local young talents in agriculture

Encouraging young Singaporeans to take up careers in agriculture and supporting local talents

Increased public engagement

Increasing awareness, connection and support for local produce in Singapore

COMPONENTS OF THE VISION

AN INTEGRATED PRECINCT FOR COMPLEMENTARY PRODUCTION

- Integrated precinct design to maximise connectivity and complementarity
- Stacked growing spaces for intensive production
- Zoning to balance intensity with regeneration

AN INNOVATION ECOSYSTEM CONNECTING GROWERS, SCIENTISTS AND TECHNOLOGY

- Research & Development Centres of Excellence for tropical species
- Technology service providers on-site to work alongside growers
- Connection to other agri-tech institutions in Singapore

ENVIRONMENTAL SUSTAINABILITY AS A DRIVER OF INNOVATION AT LCK

- Catalytic enterprises to drive circular resource flows between operations
- In-built environmental standards, data collection and reporting
- Regenerative and renewable approaches to agriculture

ENABLING GOVERNANCE, CULTURE & COMMUNITY AT LCK

- Unified identity, ethos and culture for the LCK community
- Collective governance models for the management of LCK
- Streamlined and flexible regulatory environment to enable innovation

SHARED SERVICES TO REDUCE COSTS AND ENCOURAGE COLLABORATION

- Plug and play entry for start-ups and businesses ('hawker centre model')
- Shared services across the value chain easily available on site or nearby

PUBLIC OUTREACH AND VISITOR SERVICES TO DRIVE PUBLIC ENGAGEMENT

- On-site visitor centre and F&B outlets to attract visitation
- Outreach to the city via pop-ups and similar events

A COLLECTIVE VISION FOR THE FUTURE LCK

RECOMMENDED BEDROCK INFRASTRUCTURE

1. Hydro power station, renewable energy centre
2. Germplasm centre
3. Power supply, such as waste to energy plants
4. Centralised water supply
5. 5G internet network
6. Waste management
7. Provide infrastructure for logistics and human resource (public transport, wide roads etc)
8. Regulatory green lanes, such as special waivers for faster & more efficient approvals to help speed up construction
9. Robotic friendly infrastructure to enable robots to be developed & move about LCK freely and easily
10. Building mechanisms and machineries to ensure optimal consistent environment for the farm crops
11. Processing services
12. District cooling
13. District rainwater harvesting
14. Access to centre of excellence (i.e. laboratory equipment, analysis tools at low cost).
15. Access to knowledge database, academia, trained professionals
16. CO_2 purification
17. Natural building materials
18. Connections with Agri-Food Innovation Park
19. Remote sensing and monitoring
20. Crowd-funding mechanisms

WHAT DOES IT LOOK LIKE TO BRING TOGETHER THE VISIONS?

While there is a strong coherence between the different visions proposed by the five groups, there remain trade-offs, information gaps and points of dissensus that will need to be considered during master planning.

Pointers from participants:

Trade-off 1: Production Intensity vs Environmental Sustainability
How far can we contribute to '30 by 30' from LCK, without putting environmental sustainability at risk?

We seek to address this trade-off through innovation in our operations and methods (high tech and ecological tech, circularity and more)

Trade-off 2: Production Efficiency vs Diversity
How diverse should the composition of crops in LCK be? Should we just focus on producing one thing well?

Diversity can promote resilience in production, which can reduce production disruption risks, as well as drive innovation

Trade-off 3: Standardisation vs Differentiation
How far do we push standardisation to promote integration and scale, rather than allowing diverse and bespoke systems/solutions?

Standardisation can mean quick approvals and plug and play operations and integration, but might not be suitable for all

Trade-off 4: Conservation of the Existing vs New Uses
How much heritage should we conserve in LCK?

What is the value we put on the heritage of LCK, as part of our city and history? How can we balance this with our production needs?

Trade-off 5: Secure, Closed, Operational vs Open and Engaging to the Community
How open to the public should we make LCK?

Biosecure working sites might not be the best place for visitors - but we can still create an engaging experience at LCK in the appropriate areas

Trade-off 6: Production vs Technology Export
While research can boost production over time, how far should we go focussing on innovation outcomes?

Research and production are actually symbiotic. Research is needed to boost our production, and need not take up valuable land space through the designs proposed.

CONCLUSION

The LCKMP Stakeholder Engagements have officially concluded after six months and 11 sessions involving over 300 stakeholders. This report is a summary of everyone's efforts and SFA would like to thank all participants for their time and contributions.

Armed with the insights and ideas contributed by the participants, the master planning of LCK will be the next step we will be embarking on to bring our collective visions of the future LCK to life.

"It gives us much hope that the future ahead of us will be bright. It is really growing a green dot. We are in the business of growing, we're in farming, and we want this green dot to be bright and shining green, beyond Singapore. It is growing a beacon, and this beacon is LCK. LCK will be a beacon for us in so many ways, be it in growing sustainably, in waste management, and in balancing the ecosystem of our natural world.

As we develop LCK, I'm sure we'll have further conversations. Thank you for your passion for Singapore, for agri-tech, our nature and environment."

- Ms Grace Fu, Minister of Sustainability and the Environment

Appendix 1: Participants in Phase 2

The participants who joined for Phase 2

Food Farms

Name	Company
Sharon Goh Swee Hoon	Goh Swee Hoon Fish Farm
Darren Ho	Urban Farming Partners
Dave Huang	Kok Fah Technology Farm
Balajee Potala	Nextgen Farm Pte Ltd and LivFresh Pte Ltd
Gaurav Saraf	Greenhood
Ankesh Shahra	Vertivegies
Mark Wee	Vertivegies
Yap Kok Cheng	Qian Hu Fish Farm

Non-Food Farms

Name	Company
Edmund Toh	Toh Chin Leong Construction
Kenneth Toh	TEHC International Pte Ltd

Ecosystem Players

Name	Company
Enrique Barcellin	Meat Traders' Association
Roy Chiang	CBM Pte Ltd
Eng Chong	Singapore Agro-Food Enterprises Federation Limited
Yvonne Law	FoodXervices
Durga Sathiakumar	Shiok Meats
Angela Torress	Meat Traders' Association
Kevin Wong	New Agri Seed Pte Ltd

Incubators

Name	Company
John Cheng	Innovate 360
Adam Lyle	Padang & Co

Solution Providers

Name	Company
Lawrence Chan	Asiatic Agricultural Industries
Amandeep Bedi	ENGIE Impact
Tommy Lek	Bear Pte Ltd
Louis Lee	Bluefield Renewable Energy Pte Ltd
Augustine Quek	Bear Pte Ltd
Eddie Tan	Sembcorp
Timothy Tan	Kingdom Farms
Tan Wee Kee	NUsoil Pte Ltd
Teo Kah Chin	Sobono Group
Rochelle Yong Zi Hui	Stemcell United
Lawrence Yow	Westcom Solutions

Nature Groups

Name	Company
Leong Kwok Peng	Nature Society of Singapore
Debby Ng	HantuBloggers
Sam Shuqin	NUS Tropical Marine Science Institute
Ria Tan	WildSingapore
Edric Wong	Singapore Youth Voices of Biodiversity

Members of the Public

Name
Chan May Yen
Chan Inn Leng, Summer
Christine Chua
Felicity Chan Hwee Hwa
Vivek Chotteyandamada Chengappa
Leong Huey Min
Liew Yong Chiang
Daryl Lim Peng Song
Dilip Kumar Limbu
Kirtida Mekani
Muhammad Firdaus Bin Kordi
Davis Ngiam Wei Jun
Syarifuddin Azhar Bin Rosli
Syarah Ali Imran
Tan Kah Li
Beatrice Tan
Caleb Wee Kai Yi
John Yeo Sheng Tong

Government Agencies

Name	Company
Bian Ruoyi	URA
Chang Xiu Li	EMA
Alvin Chiew	NEA
Cao Lei	ESG
Aloysius Iwan Handono	JTC
Jaslyn Koh Mui Peng	JTC
Kwan Su Min	STB
Elyssa Ludher	Centre for Liveable Cities
Thomas Leng	NParks
Desmond Li	EDB
Ng Wee Tat	STB
Ong Fang Xun	STB
Pong Shi Min	URA
Gloria Pang	URA
John Teo	NHB
Wang Junyang	URA
Wang Yean-Mei	LTA
Wang Junyang	URA
Wong Teck Han	LTA

GPC Network

Name
Choo Yan Min
Ng Wee Hoe
Tan Han Sen

IHLs & Educators

Name	Company
Dr Ritu Bhalla	Republic Polytechnic
Gan Heng Hui	Nanyang Polytechnic
Dr Goh Lay Beng	Temasek Polytechnic
Dr Steve Kardinal Jusuf	Singapore Institute of Technology
Liu Xianglin	MOE
Liu Zhen	MOE
John Ngau	MOE
Dr Zhou Weibiao	National University of Singapore

Master Planners

Name	Company
Chan Ee Mun	WOHA
Charng Yen Shu	Surbana Jurong
Pearl Chee	WOHA
Juliana Ding	Ramboll
Goh Wee Heng	AECOM
Phuan Ying Zee	AECOM
Seven Qi	AECOM
Deepak Sankaranarayanan	AECOM
Peter Stones	AECOM

Youth

Name
Vanessa Koh
Leong Chao Yang
Sammie Ng
See Yong Feng
Darren Tan
Woon Siew Yan

Investors and Banks

Name	Company
Jerry Chew	UOB Bank
Chua Beecheng	OCBC Bank
Angela Tien	OCBC Bank
Kristine Koh	OCBC Bank

Appendix 2: Participants in Phase 3

The participants who joined for Phase 3

Group 1 - Economics

Name	Company
Dr Farshad Shishehchian	Blue Aqua Fish Farm
Koh Chern Peng	Seng Choon Farm
Lau Chuen Wei	Singapore Agro-Food Enterprises Federation Limited
Daniel Lai	Candy Floriculture
Dr Gary Ng Sum Huan	A*Star
Dr Godge Mandar Radhakisan	Temasek Polytechnic
Tan Chun Heng Chester	Sobono Group
Roshe Wong	Sky Greens
Phoebe Xie Xinyi	AbyFarm
Masahiko Yamada	Umitron

Group 2 – Economics

Name	Company
Chew Chee Bin	Singapore Agro-Food Enterprises Federation Limited
Philip Gu Huanqing	Stemcell United
Lan Yi Chieh	Member of Public
Dr Lim Boon Whatt	Republic Polytechnic (RP)
Oh Puay San	Keshet
Robert David Hulme	The Boralis Group
Darren Tan Sijie	Comcrop
Wang Wei	Ramboll

Group 3 – Experience

Name	Company
Han Ping Ping	SPV Global
Dr Loh Siaw Ee	Sobono Group
Benjamin Swan	Sustenir Agriculture
Murugesan Sethu	MOZARK
Chintan Anil Raveshia	Arup Group
Teh Hock Beng Michael	Nature Landscapes
Alexys Tjhia Lie Ting	Habitat Collective
Benjamin Yap Whee Kiat	CapitaLand Group
Melissa Yip	AECOM

Group 4 - Engagement

Name	Company
Kenny Eng	Gardenasia
Matthew Robert Howe	Grobrix
Ma Chin Chew	N&N Agriculture
Tammy Ng Shi Ming	Yummy Sprouts
Malcolm Ong	Kranji Countryside Association/ Metropolitan Fishery Group
Suzanna Tang	Urban Origins
Anton Wibowo	Trendlines

Group 5 – Environment

Name	Company
Koe Loong Chen Marcus	Habitat Collective
Toby Kyle	Grant Associates
Roc Koh Chit Song	Corridor Farmers
Dr Lau Chin Leon Lionel	ITE College East
Ruan Lim Whei Lei	Social Planter
Oh Wee Khoon	Sobono Group
Pavarne Shantti Sivalingam V M	NUS Tropical Marine Science Institute
Dr Jani Tanzil	NUS St John's Island National Marine Lab
Seah Zi Quan	Member of Public

REPORT ON LCK MASTER PLAN STAKEHOLDER ENGAGEMENT

MAY-OCT 2021