ENVR 4980 Capstone Project

Final Report:

HKUST Campus Orchard

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Executive Summary

Being ranked as Asia's No.1 university by the regional QS Asian University Rankings from 2011 to 2013 and one of the fastest growing institutions by Times 100 under 50 universities in 2014, HKUST is not only known for its advanced scientific research and business development achievements, but also the spectacular sea view over Port Shelter of Tai Po Tsai. Even inside the campus, there is no lack of greenery. Nonetheless, with a nickname of the University of Stress and Tension, the HKUST community does not seem to have time enjoying the natural environment such as the LG7 grassland.

Currently, the HKUST campus hosts an organic farm at the LG7 grassland, allowing members of HKUST who are interested in growing their own food to rent a piece of land for half a year. The success of the community participation model of the organic garden suggests that more areas in the campus could be utilized more effectively and productively for the community's interest. Through better design for space, we can gradually improve the stressful academic environment by infusion of sustainable lifestyle and outdoor experience. This is the reason why the Campus Orchard Project, as commissioned by the Sustainability Unit, was initiated. In contrast to the organic farm, this is a long-term establishment that aims to enhance community's engagement with nature through experiential learning and gardening. It is believed that the fruit orchard will help advancing HKUST's mission in sustainability and possibly academic endeavor.

In order to produce a truly sustainable orchard plan, we have continuously engaged all stakeholders by organizing numbers of meetings, interviews, and presentations. Amid this process, we had to make adequate amendments to the plan so as to balance stakeholders' expectations and needs. All these efforts helped us to obtain the approval for project launch from Facilities Management Office (FMO). This report details the overview and description of working timeline, stakeholder roles and inputs, site and species feasibility planning, project publicity and marketing, future organization and coordination, execution, and future development.

Table of Contents

I. Introduction of Project Aims

Sustainably Operated Orchard

Our key objective for this project is to develop a sustainably operated orchard that serves as an excellent place for HKUST community to interact with the nature. As the best way to engage the community is to gather its members who are interested or passionate in sustainable horticulture to get first hand experience, i.e. to take care of the orchard, we have come up with the idea of setting up a HKUST gardening club. It is hoped that this could not only be a channel to provide sufficient manpower, but also to promote the concept of sustainable eating to the rest of the community through various activities like gardening workshops, cooking workshops and guided tours, etc. With a mature orchard, this project intends to achieve three side objectives:

A. Education

We believe orchard can help our community to learn more about their relationship with nature through workshops, campaigns as well as gardening practice. This outdoor learning is not limited to those who are interested in gardening, but for anyone who is part of HKUST and has potential to make an impact on its environment.

In fact, over 60% of staff respondents from our 1st Survey answered that they would like the orchard to promote education [Appendix A]. We believe we can accomplish this in two ways, which are training volunteers for gardening (including pruning, watering, growing cycle, which will be listed in the guidelines handed over to the Sustainability Unit) as well as educational campaigns and interactive workshops, such as teaching recipes involving fruits. In the end, our community can be acquainted with different species, horticulture and gardening skills. Not only that, as they learn how much time and efforts are needed in producing one single fruit, they would start to appreciate the surrounded nature.

B. Enhancing beauty on campus

Although, HKUST has a lot of greeneries and beautiful seaside, it often lacks vivacity. We hope colourful array of fruit trees in back of our LG7 grassland can

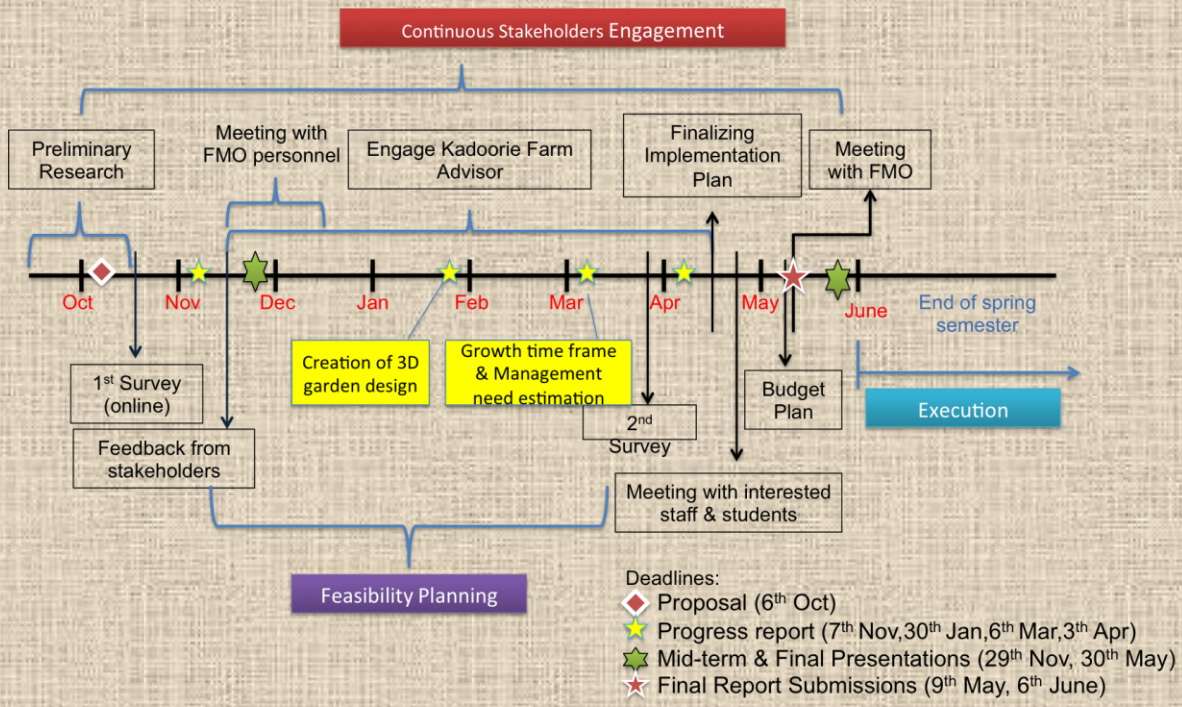
improve overall aesthetics of our campus, making it not only attractive site for community, but also tourists, residents, secondary school students, etc. Not only it can make HKUST as a leading academic provider, it can be renowned for its beautiful scenery. Again, the 1st survey suggests that students highly prioritized this as one of the side functions of the orchard.

Unlike the organic farm, which is closed area for small groups of people to grow their own crops, orchard open for people to freely walk around and appreciate beauty of the nature by smelling, seeing, touching them in their daily lives.

C. Promote Sustainable Eating

It is often difficult for students keep their diet healthy at HKUST, as most of the menus are greasy with poor balance of vitamin source. We hope the orchard, which will be grown organically, is a good source of refreshing, balanced and sustainable diet. Also, we believe this side-objective can be a good way to attract people who are not really interested in gardening, as volunteers can have the fruits as reward for their hard work. Moreover, there will be some interactive events like harvest party, which will help to raise awareness of eating locally grown organic produce.

II. Working Timeline Overview



Knowing the values behind, we endeavored to set up the orchard throughout two semesters. Since mid-September, we have done preliminary research on both potential species and sites. Agriculture, Fisheries and Conservation Department's list of sub-tropical fruits were the starting point for our desktop research to identify their feasibility of planting in HKUST. Several criteria have been used, such as canopy size, height, growing cycle, pest control, etc. In contrast, for potential sites, we have toured around whole HKUST campus and identified 16 relevant sites. However, we realized that there were still too many options. During preliminary research process, 1st online survey was conducted among students and staff to understand their preference and expectation for the proposed orchard. This overall helped us to streamline and focus the direction of our project.

As our project's main objective is to engage all HKUST community, we continuously engaged all our stakeholders from start to end of our project. However, the initial stage of stakeholder engagement was during mid-November, as we really consulted influential stakeholders such as FMO personnel (who raised concerns about project's disruption to land use as well as long-term viability), Kadoorie Farm personnel (who have sufficient knowledge and experience in horticulture to uplift the project's practicality) and the Sustainability Unit (who

gave us criteria how to balance all other stakeholders' needs and suggestions). Throughout the process, we have designed 3D models of garden as well as estimated growth time frame and management needs. Another round of survey was conducted during the Gardening Workshop held by the Sustainability Unit in late March to identify interested parties in gardening, which enabled us to hold a lunch sharing session later in mid-April. Before that, we have finalized all the implementation plans including the drafted budget plan, which was shown to our potential volunteers at the sharing session. After confirming all the practical details as well as ensuring there are people interested in sustaining the orchard, we presented the final proposal to FMO in early May and got their approval. With this approval, we proposed our planting day on 21st of May. In between those time, we have set up Facebook group with self-designed logo, promotion leaflets (which was later posted on staff hall quarter), as well as preparing all the seedlings, construction materials, and planting tools. However, due to bad weather, the event was postponed for two weeks. In the end, we could successfully launch the Planting Day on 28th of May with 15 volunteers.

III. Stakeholder Engagement

Over the course of our capstone project, we have been engaging 5 major stakeholders, which are aligned with our initial proposal in October 2014. Our project's success very much depends on support from our key stakeholders, hence engaging them is crucial. Below is an overview of what we did and achieved.

A. Sustainability Unit (Marvin)

We have arranged meetings with our client, the HKUST Sustainability Unit (The Unit) on a monthly basis to report our progress and discuss our next step. We had a full understanding of the project after the first meeting. After that, the Unit has been guiding us in the right track throughout the whole project. As Sustainability Unit is our client, we continued to engage intensively with them to understand their expectations. As the project period ends, our group will pass on the orchard management to them, so our engagement with the Unit is among the deepest.

B. HKUST Community

In order to engage the community, we have carried out two rounds of survey in Fall and Spring semester respectively. The first survey, which took place through both face-to-face interview and online survey, aimed to understand our community's views and preference for a campus orchard we proposed. It was found that respondents are in general positive about having an orchard on campus due to the fact that it creates a place for relaxation, allows them to learn more about nature and farming, and increases their interaction with the nature. Besides, their concerns for an orchard were also disclosed, which are mainly related to space and accessibility, insects and animal problems, responsibility and ownership, and long-term management. Moreover, education function of the orchard is also strongly valued by staffs. Nearly 60% of them have selected 'Learn more about nature, trees and farming processes as their value in our first survey, which reaffirmed the correctness of our project objective [Appendix A].

The second survey was done at the Urban Gardening Workshop by the end of March to identify potential interest groups and understand their preference on 4 suggested species, namely papaya, lemon, guava and kumquat, as well as on harvest management. To our delight, more than 50 interviewees (59) have expressed interest in participating in the new HKUST Gardening Club that the Unit and we plan to set up (Appendix B). Among the 59 interviewees, 50 of them are willing to play a gardening role, 20 for event organizing and promotion, 9 for gardening trainer and 5 for founding committee. Most of them are able to devote

1-3 hours per week to club-related matters. Therefore, by the time the finalized floor plan design is released in late April, we invited these people to a lunch meeting.

In the meeting, we and another project group called the Green Wall Project introduced our projects both associated with gardening, and ways to recruit more members to the Gardening Club were discussed. For example, proximity has been identified as an important factor impacting the continuity of volunteer work since people will find less psychological obstacles to go and take care of plants if the place is near to their place. As a result, our target group for promotion has been set to residents in Tower 1, 2, 3 and 4, where promotional posters and emails are two possible marketing channels. Besides, a Facebook page for the Gardening Club has also been set up for gathering interested members through social networks of existing enthusiasts. Despite delays due to bad weather, we were glad to see some of those interested people coming to the planting day on 28th May (Thu), including students from the engineering and business school and one staff with her daughter.

C. Facilities Management Office

From the beginning of the project we were told that the Facilities Management Office (FMO) is in charge of the land use in the campus, therefore we have been engaging them since October to understand their stands towards our project. The first contact we made was to Jerome Hon, the Executive Officer of the administrative section in FMO, who had given us a broad understanding of potential barriers and constraints in setting up an orchard on campus. For instance, the major obstacles identified were the potential change in original land use purpose, the already inadequate space for trees planting, and the concerns over long-term sustainability. In term of administration, he advised that the approval from the Campus Development Advisory Committee (CDAC) is required, though it was later clarified by Andrew Nowak, the Associate Director of the Development and Estates Management Section (DEMS), that only approval from him is sufficient. Jerome also pointed out some suggestions on alternative directions for our project and referred us to Jack Chan, Head of the HKUST Horticulture Team to gain good understanding of HKUST's environment.

In November 2014, we had our first meeting with Jack Chan from which the issue of lacking planting space for compensation purpose as well as safety problem associated with trees was better understood. Under the existing Compensatory Planting policy, the school is required to compensate for the trees removed for buildings development by replanting trees at a ratio of 1:1 in terms of quality and quantity. However, owing to the limited land available in HKUST and the fact that most of the land has been designated for specific usage such as recreational or further development, Jack revealed that his team was also facing difficulties in searching for spots for compensatory tree planting. In the light of this situation, we proposed to generate a plan to convince personnel in charge of its benefits over its cost. Understanding our ambition, Jack provided us with the contact of two other senior personnel in FMO - Mr. Andrew Nowak, who oversees the Horticulture Team, and Mr. Raymond Ho, Senior Manager of DEMS.

The first meeting with Andrew Nowak was held in early December 2014. During this meeting, we basically asked for clarifications of approval procedures and his preference over different project directions. It turned out that we only need his approval for launching the project. We found that his top priority for our orchard plan is about degree of maintenance required. The ideal case would be zero maintenance. If maintenance is needed from them (FMO), a convincing argument has to be made, for example with backup from students and staff why it is necessary. Additionally, he suggested the south gate covered walkway for us for exploration, which later on, however, was removed from our consideration due to our limited time frame and resources. Other ideas such as planting on roofs or indoors have been discussed but were negatively commented by Andrew.

By early May 2015, we finally managed to arrange a time for meeting with Andrew and all our advisors to present the final proposal of orchard design and management. After presenting once, we were delighted to hear Andrew's approval of the proposal. After that, we started preparing the planting day that was tentatively scheduled in two weeks after the meeting. In order to smoothly organise materials and tools purchase and borrow, we liaise again with Jack, who have asked for contractors' help in marking the site area, offered temporary

storage space at the greenhouse, supplied CDG (Completely Decomposed Granite) as top soil and lend tools for the planting day. On top of that, he also gave valuable suggestions on the type and supply sources of fences and outdoor storage lockers.

D. Advisors

In this project, we have both internal and external advisors, who all have been a fundamental support for our project. They are our teachers throughout the 9 months; internally, our faculty advisor Professor Stanley Lau has been giving us practical advice on how to make the project's direction clear and appropriately engage HKUST community.

Externally, since our team do not have much basic agriculture and horticulture knowledge, right from the beginning of the project, we consulted a number of experts from horticultural background. Over two semesters, we have visited two farms, the Nature Harvest (NH), and the Kadoorie Farm and Botanic Garden (KFBG).

In early November, we visited Nature Harvest, an organic farm situated right next to HKUST campus. During the visit we understood more about the environment around HKUST as NH is also facing the same weather and climate conditions as UST over the year. Through a conversation with their staff, we learnt the knowledge necessary for species selection and successful and sustainable operation requirements. Moreover, through some down-to-earth farming activities, we gain more personal feeling of how farming is like.

In mid-November, we had our first meeting with Tsz Lam and Carol, two Sustainable Agriculture Officer from KFBG. It has been a rewarding journey since then as they are extremely helpful that we got most of the advice and recommendations related to species and site selection, orchard design and plant care, and ideas to engage community. We engaged so deeply with them that we kept updating them through sharing important processes by emails, for instance, the creation of 3D models, changes in focus direction and narrowing down of species choices. In April when we hope to fix the orchard floor plan, we were lucky to be able to meet with Tsz Lam right on the LG7 site for direct comments. Amid

our conversations with him, he offered to supply some of the seedlings including papaya, guava, and pineapple for our initial set-up. After getting approval from the school, we invited Tsz Lam to be the instructor in the Orchard Plating Day to demonstrate the landscaping and transplanting work.

E. Potential Partners

Over the course of the project, we have tried our best possible to reach out to potential parties whom we might work with. Apart from choosing the right orchard site and fruit species, we have realized since the beginning that volunteers is the key to the project success. Therefore, we contacted Winson Yau from the Staff Association (SA) whom we thought to the person in charge of the Organic Farming Club in SA. Although no agreements have been made at that time, we have learned about the operation of the existing organic farm at LG7 and the important observation of the higher stability of staff over students in continuous gardening care. Apart from that, we have also interviewed some of the canteen managers in order to understand their view over engaging in activities related to the orchard, for instance sourcing fruits from the orchard and/or helping in cooking workshops.

During the past Spring semester, we were introduced to the Green Wall Group, one of the Eco-Representatives' projects, by the Sustainability Unit. The Green Wall is planning a sustainable green wall and a green platform to be located outside the garden of LTJ. Since both of our projects are looking for passionate gardeners from the university to become carers for orchard trees and green wall plants, we saw the opportunity for cooperating to set up a new Gardening Club in HKUST and attract people who may be interested. So far, we have been conducting the Gardening Club Survey (2nd) together and hold a meeting with potential volunteer for the club.

IV. Feasibility Planning

The major components in our feasibility planning process are comprised of site and species selection, preliminary design and final design stage. To start

A. Site

In site selection, the steps according to their chronological order are potential site identification, site evaluation, and site selection. During the last semester, through site visits (I.e. walking around the campus) we identified 5 potential planting sites: LG7 grassland, One World Fountain, Amphitheatre, Staff Quarter, and the South Gate. We later replaced the south gate site by the Covered Walkway, which will be a future campus development at south gate area as suggested by Andrew (FMO) as one potential site for our project.

Site evaluation was based on a few criteria generated to our knowledge after combining the concerns raised by our key stakeholders in interviews and survey and suggestions from horticulture professionals we consulted. The first criterion is undoubtedly sunlight availability as its sufficiency could affect fruiting ability and quality. Secondly, accessibility is also important as it whether the site is easily accessible could greatly affect degree of community participation at an initial stage. Thirdly, surrounding environmental conditions, such as proximity to water source, people flow and road traffic, and other amenities can determine the ease in maintenance, exposure rate versus security issue, ease for harvest management etc.

Selection Criteria

Overall, looking at the full range of criteria, LG7 lawn is identified as the best site due to adequate sunlight, high accessibility, high proximity to water source due to closeness to existing organic farm. Besides, for car/people traffic, 'moderate' amount is the best since this ensures considerable degree of site exposure, while allowing enough site security because too many people flow may pose a risk of unintentional or deliberate damage of fruit trees or unauthorized fruit picking. As for land use disruption, although the lawn was designed for community recreation, the orchard will not disturb people's enjoyment to a large extent since it is located at the far end of the lawn where very few people approach.

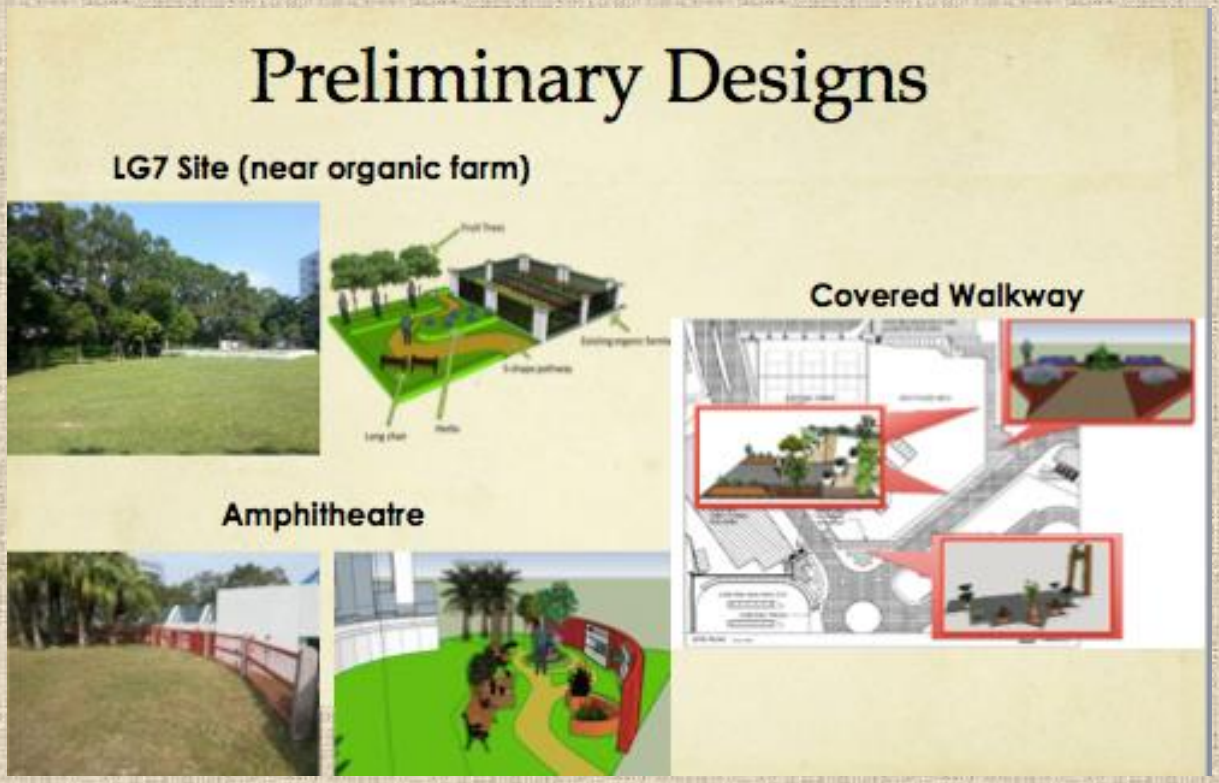
Overall Comparison

Most Feasible Site!

	Sunlight	Water source	Accessibility	Car/ People traffic	Land Use Disruption/ Visual Impact?
LG7 lawn	☺	☺	☺	Moderate	Low
Amphitheatre	☺	😐	😐	Low	Moderate
Covered Walkway	☺	😐	☺	High	Low
Staff Hall	😐	😐	☹	Low	Low
One world fountain	😐	😐	☺	Low	High

It seems that the whole process was easy and straightforward. The real situation however was not. With different suggestions from our advisors, we have looked into various opportunities for different sites. For example, towards the end of 2015 Winter Break, we have narrowed down potential sites for the orchard to three namely LG7 area (near organic farm), amphitheater, and covered walkway (near south bus gate) which were considered having high potential as a means for community education and engagement [Appendix C1 to C3]. We then produced 3 preliminary designs.

Later on, we further our evaluation can found that planting the orchard in amphitheater can be a great disturbance to community to gather and perform as the area is small. As for the covered walkway, we realized it is impossible to implement the orchard within our time schedule as the construction has just begun to start. Changing their plan requires a lot more negotiation effort with the school and their contractors. It may also need top management approval. Hence, we decided to use LG7 as our priority site.



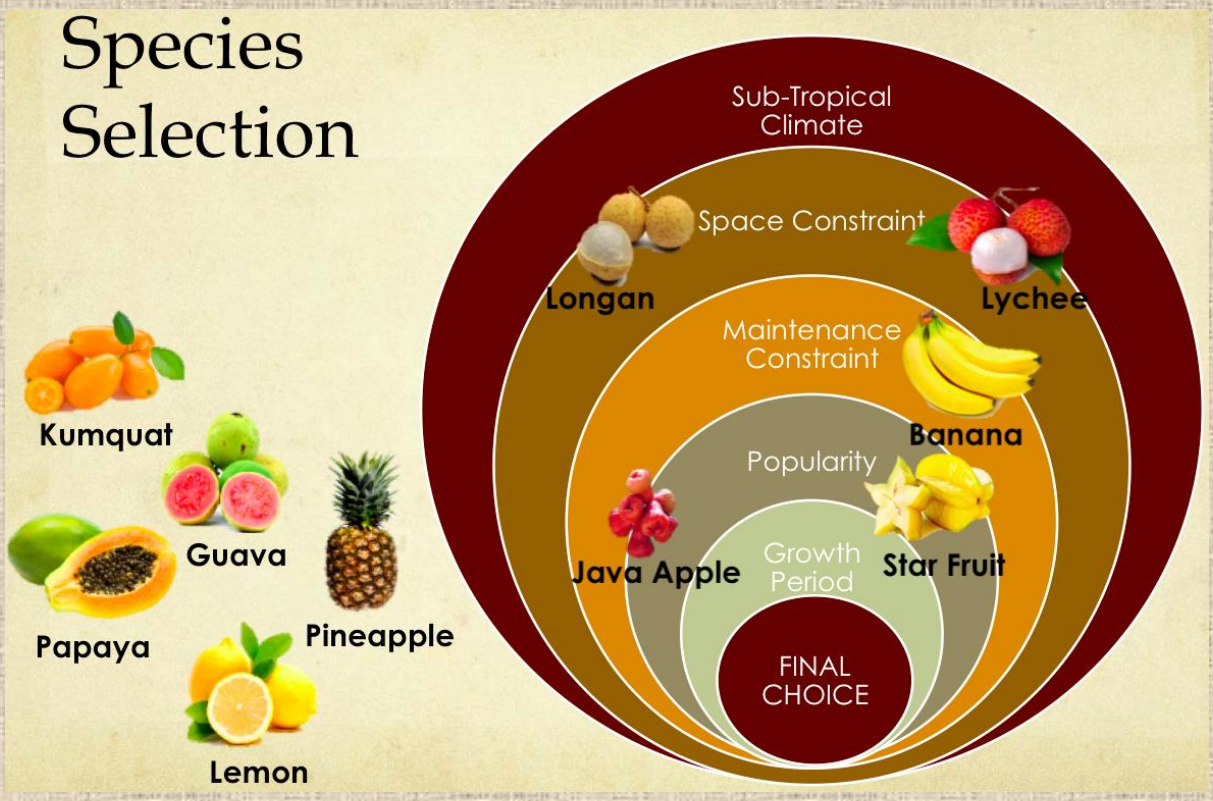
During that stage we included herbs in our plan since herbs are fast growing and carry more attractive smell and appearance than fruit trees. Including them in our orchard can infuse vibrancy and fun elements, which in turn appeals wider

range of members of our community. However, due to frequent maintenance requirement for herbs, we put this idea aside after discussion with our corporate advisor. There was also once an idea of planting on rooftops suggested by our client, however, as we later received a negative feedback from Andrew regarding this idea and due to the limited time and capacity our team has, we did not look further into the feasibility of rooftop orchard.

B. Species

When it comes to species, we started off with desktop research to collect information about the common fruit trees in Hong Kong, for example height, growth conditions and maintenance requirement. Further information was supplemented by the Agriculture and Fisheries Conservation Department and farms including the Nature Harvest and Kadoorie Farm and Botanic Garden (KFBG).

Evaluation Diagram



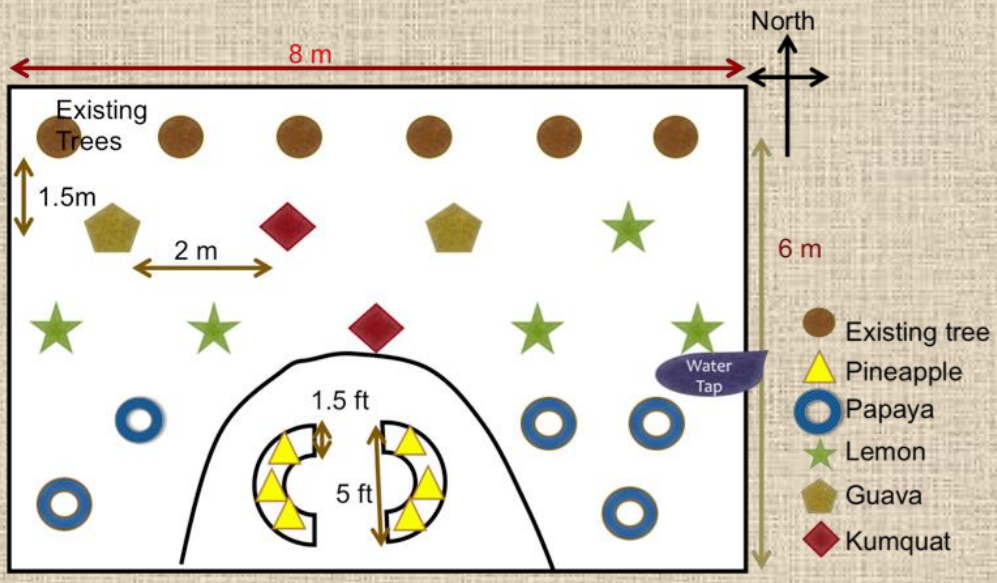
This diagram shows different criteria ranking in a descending order according to their covering scope. Obviously species that fell into our list must first be suitable to grow in a sub-tropical climate, so species such as strawberries, apple and orange are filtered out, as they do not grow well. Then it comes to space constraint, having communicated with Jack Chan from the horticulture team,

we realized that space is very limited on campus. Large trees such as longan and lychee cannot be grown despite their high suitability in HK. Another criterion is maintenance constraint, which entails pruning, watering, and fertilizing needs. Although Banana is highly recommended by the advisor we consulted, it requires a huge amount of water. In our case, the land on campus is not wet enough; growing banana will unavoidably increase maintenance workload. Fourthly, popularity of fruits is important for successful community engagement. Some fruits such as java apple and star fruit are rarely consumed. Planting those may risk our project becoming unattractive. Last but not least, we prefer fruit species with a shorter growth period. It is because shorter growth period means faster harvest, therefore increasing chance for engagement.

The finalized lists of species are papaya, kumquat, guava, lemon, and pineapple. It was overviewed by the Sustainability Unit as well as the community in our 2nd survey to ensure their suitability and popularity. Apart from that, we have also continuously sought advice from the KFBG to confirm their feasibility.

V. Final Orchard Proposal

A. Orchard Design

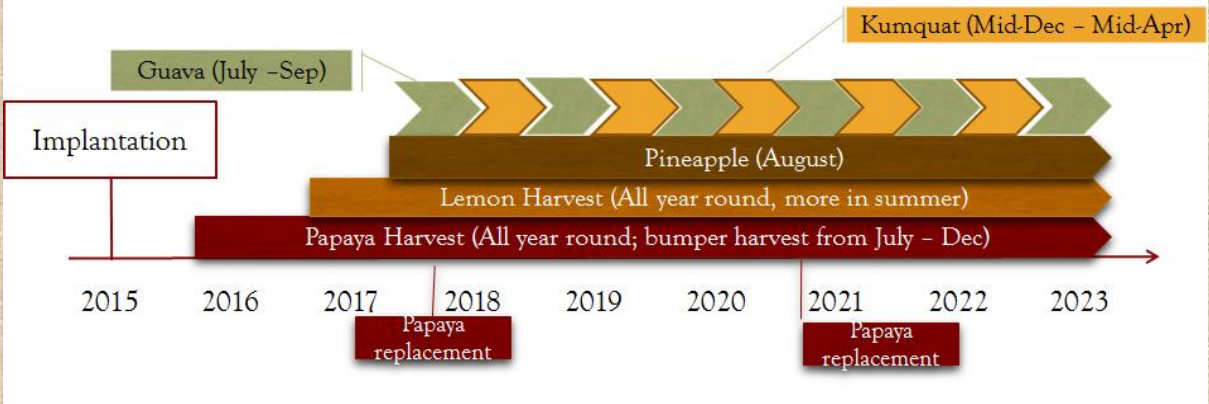


Floor Plan

Basically, the arrangement of species follows the principle of adequate sunlight. Taller trees with larger canopy, i.e. guava and kumquat are placed at the back row and towards the middle, whereas shorter trees with small canopy like

lemon and papaya are places at the periphery and towards the front. Pineapples are planted in planters with their own soil as they like dry soil conditions.

B. Harvest Timeline



This timeline shows the times over the next 8 years when the fruit trees will get harvest or need replacement. More details will be included in the volunteer guide submitted to the Sustainability Unit separately for use in future volunteer instructions.

C. Harvest Volume

Species	**Annual Harvest Volume**	**Total Annual Harvest**
Lemon *(Citrus Limonum)*	10-20 lemons / tree (~3kg)	50-100 lemons
Papaya *(Carica papaya)*	15 papayas / tree (~30kg)	75 papayas
Guava (*Psidium guajava*)	20-30 guava / tree (~10kg)	40-60 guavas
Kumquat *(Citrus japonica)*	25-35 kumquat/ tree (3-4 kg)	50-70 kumquat
Pineapple *(Ananas comosus)*	1 pineapple	6 pineapples

D. *Management Plan*

i. Growth Cycle + Major Workload

As different species have different growth cycles, the management time will also be spread out. It is recommended that the orchard is monitored as least once a week by fixed volunteers. Normal monitoring may only take 15 minutes. Pruning is normally needed after harvesting. Fertilization normally occurs in Spring but we may also need to fertilize during other growing periods. The following table shows the time of a year for pruning:

	Pruning
Guava	September
Lemon	Flexible as it flowers in all seasons
Kumquat	February/March
Papaya & Pineapple	No need

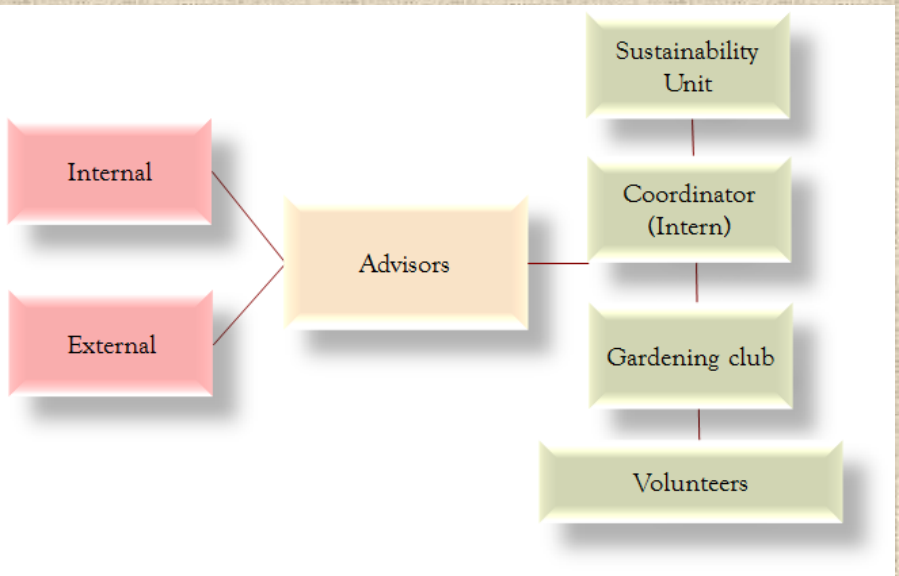
ii. Man-power Need Estimation

There are three types of major workload, which are monitoring and irrigation, pruning, and fertilization. We have estimated required man-hours required for first year as below.

Monitoring & Irrigation: 15 min/wk*52 = **13 hrs/yr**
Pruning: 2 hrs* 4-6 (in specific months) = **8-12 hrs/yr**
Fertilization: 1-2 hrs* 2-3 times = **2-6 hrs/yr**
Harvest event organizing: <10 hours

There will be 2-3 minimal number of volunteers required. However, time required will gradually decrease, as they will have more experience. Also, as the above estimation is only subjected to the existing orchard plan, more volunteers are needed if there is further expansion of the orchard.

iii. Management Structure & Gardening Club



An orchard will not sustain without proper management, thus one of the important tasks for our group is to develop and propose a feasible and sustainable management structure for the orchard. As mentioned above, the Green Wall group and the Seeducation group are working with similar projects. The Unit suggested us to form a Gardening Club to coordinate all these projects.

Above is the finalized version of the management structure our group suggests. We have two main principles when deciding the structure, simple and sustainable, as a complex structure will simply increase the workload of Sustainability Unit and affect the direct participation of the volunteers. On the other hand, this structure needs to be sustainable as this is one of our core objectives and the orchard needs to be operated in a long run.

Start from the top, Sustainability Unit will be the head of the whole structure and make decision on major issues concerning the orchards. Just under the Unit, it will be a gardening intern hired by the Unit. The intern's responsibility is mainly the coordination of the volunteers, work allocation and other administration stuff about the orchard. In our plan, the intern is temporary and we hope after 1 or 2 years there is no need to hire such an intern and the duty of the intern will be spread among volunteers. We decided this mainly because that, at

the start of the orchard, we are not confident to pass all the duty to volunteers as it is a new project for them, free-riding is unavoidable.

Under the intern, there is where the Gardening Club lies. As the orchard project is not the only gardening projects on plan, we need a Club to gather enough helpers on various projects. Under this Club, volunteers will be divided into different teams, e.g. gardening team, event organizing team, etc. It is a proposed way of working for the volunteers, but it is subjected to changes as this issue is highly flexible, we can rule out the possibility that the volunteers will take multiple roles.

There will be advisors to give advices and comments to the team if they encounter any problems concerning the orchard. The advisors will be divided into two, one is internal and the other is external. Internal advisors include FMO, horticultural team in UST and external advisors include experienced farming unit like Kadoorie Farm and Nature Harvest. Internal advisors may give advice for example on the future development of the orchard when it has been on track for several years. External advisors will focus on helping the team for technical issues concerning the orchard. Training workshops are one of our plans so that volunteers in UST can learn from them.

E. Starter Cost plan

	Quantity	Income (HKD)	Expense (HKD)
Budget from Sustainability Unit	/	$20,000	
Intern Salary	90 hours/year; $50/hour		$4,500
Seedling	25		$350 [Appendix D]
Soil and Fertilizer			
Yellow sand mud	6 bags		Free

Bran Powder (麩粉)	25kg		$175
Bone Meal (骨粉)	25kg		$150
Organic Potassium fertilizer (高鉀有機肥)	25kg		$140
Slaked Lime (熟石灰)	20kg		$50
Horse Manure Compost	6 bags (25 kg each)		$600
Tools and Construction Material			
Hoe (with handle)	4		$680
Shovel	4		$600
Red bricks	200pc		$1000
TOTAL		**$20,000**	**$ 8245**
Exclude: intern salary, fences, outdoor storage cabinet			

Above is the set up cost plan for the orchard. We are grateful to have an initial budget of $20000 from the Sustainability Unit. The price listed above is the actual price of the purchase we made from the two horticultural companies, Chun Hing Gardening & Landscaping Ltd and Wong Sam Hing Agricultural Co Ltd. The items include seedlings, topsoil, compost and fertilizers, soil conditioner, tools and building materials, excluding the intern salary, fences and outdoor storage cabinet. Details can be found in [Appendix D]. The orchard is financially feasible as the initial expense is much lower than our budget.

However, we cannot complete the cost plan yet due to some uncertainties. First, as the interns hired by the Unit will work for the Gardening Club, i.e. they will perform duties for both the orchard and other projects; it is hard for us to estimate the salary of the intern without knowing the proportion of the working

hours exclusively for our project. As a reference, we still include the rough estimation on the salary by calculating the hours needed for different tasks relating to the gardening club like volunteer coordination, contacting with advisors and event organizing work. Besides, as the quantity, size and exact type of fences and outdoor storage cabinet to be bought have to be confirmed by the Sustainability Unit, their costs will be part of the longer-term financial plan handled by the new Gardening Club.

Long-term balance

As it is just the start of the orchard, fruit species with minimal maintenance need were chosen. Thus, the maintenance cost is insignificant; the only foreseeable significant cost in operation will be the replacement of trees and reparation cost of the infrastructure.

However, in the long run, it is not sustainable for The Unit to be the only source of income, especially when the orchard scales up. Apart from asking funding from the university or the Department of the Environment, collecting membership fee from the Gardening Club members can also be a good way to include more income sources later on when the orchard is ready to be expanded. Also, selling the harvest to canteens or other parties may also be a sustainable income source.

F. Potential Problems and Remedy

There were several problems that may arise. To ensure such obstacles do not hinder the progress, we have come up with some solutions.

i. Pest

Actually, this was the major concern of the students, according to the first survey. Therefore, we put more considerations when choosing the species, so they do not carry any major pest problem. However, as guava fruit is very fragile, that it may be damaged by fruit flies or birds, gardeners have to cover the fruits with a bag once the tree starts fruiting.

ii. Animals

Some are concerned that the fruits may attract wild animals, such as boars, monkeys, and birds, which can potentially disrupt community's enjoyment of the orchard. At first, we have thought of building fence around the trees, however, this would hinder our community's interaction with it, thereby depriving the orchard of its unique identity as a place for enjoyment for the whole community. While Mr. Winson Yau from the Staff Association (SA), the person in charge of the Organic Farming Club at SA, has commented that monkeys and boars are not of big problem because they rarely come to the campus, we would still remind the Sustainability Unit about this issue in our transition guidelines. All in all, we believe wild animals may not be a major problem but rather a good sign to indicate that the orchard is healthy and sustaining.

iii. Spines of Lemon trees

Lemon trees, which were chosen for their popularity and feasibility, were planted to the back periphery due to spines on branches and possibility of hurting people. Apart from that, we have suggested a barrier for each of them, which will consist of iron sticks and nylon in string weaving style.

iv. Children safety (fences, nylon weaving to surround the pineapple)

Some have argued that pineapple leaves can be a great danger for children in grassland, as they are sharp. However, this may not be true as the leaves are highly visible and obvious. Children will not get hurt unless they deliberately jump onto the leaves. Nevertheless, to prevent injuries, we will choose pineapple with leaves with smoother linings, while putting net barrier around the planters with warning signage.

v. Stealing of the fruits

Furthermore, people also have raised concerns on whether the fruits will be stolen by people in or coming to the campus. As one of the main objectives of this orchard is to engage more people with it, having fruits as a reward or simply let them to pick the fruit (with beforehand registration and quota for each person) will be a good way for both achieving the objective and avoid the problem of stealing. As for those not belonging to HKUST, such as nearby residents and weekend hikers, some kind of fence barrier with warning signage can serve as moral suasion to ordinary visitors not to pick the fruits as they are university property. Moreover, it is suggested that help can be obtained from security guards near Tower 1 and 2 and grassland carers hired by the Horticulture team to watch out for strangers trying to pick fruits. To easily distinguish between authorized and non-authorized people, we suggest using specially designed stickers to stick on a person's T-shirt.

VI. Project Execution

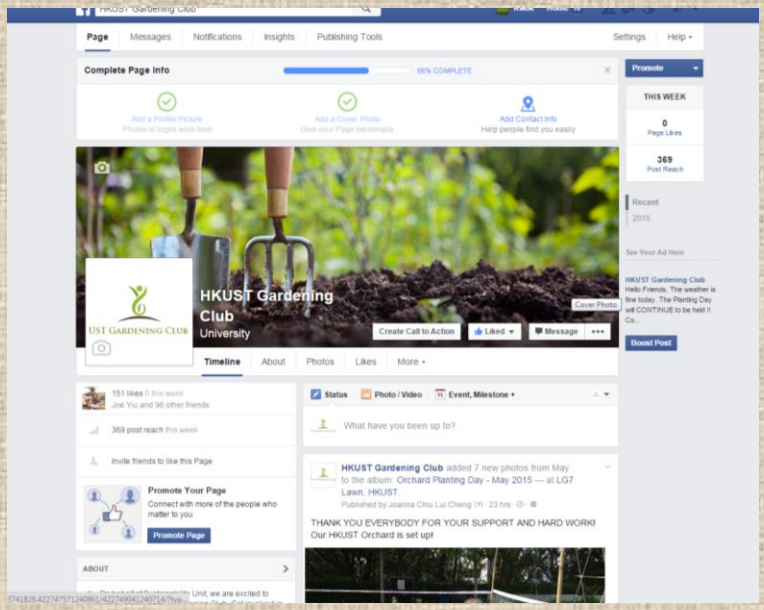
A. FMO meeting

The meeting was held on the 6th May with the presence of Mr. Andrew Nowak from FMO, Professor Davis Bookhart and Loretta Luk from the Sustainability Unit, Professor Stanley Lau, and Winson Yau from the Staff Association. The meeting was smooth and the approval from Andrew has been obtained right after our presentation.

After obtaining the approval from FMO, The Unit and our group had an urgent meeting to discuss on holding the Planting Day as our first event of the Gardening Club. Work distribution and timeline was formed at that time.

B. Promotion (channels, Target, Response)

Our group has established several promotion channels to recruit more volunteers and gain recognition among the community. They range from Facebook page to event flyers and poster, which will be posted on the campus notice board, for the Planting Day. We mainly target on three types of people. The first patch is the participants of the previous Lunch meeting held in late April, the second is the staff with children living on campus (the poster were posted in the staff halls), the third patch are people studying or working on environment-related major (eg. EVMT students and staffs). We also created google form to let the interested people register. We will keep these contacts and send them to The Unit, as they may probably be the volunteers of the Gardening Club later on. We have received around 15 responses, both from students and staff.



C. *Planting Day*

Besides promotion, a number of materials were needed for the Planting Day. Thus, we have ordered different kinds of fertilizer, soil conditioner, compost, tools, and construction material from two horticultural companies before the Planting Day.

Through this event, we also hope to recruit more volunteers to establish the gardening club. The original date for planting day was 21st May. We planned to plant 15 seedlings of papaya, lemon, kumquat and guava, which were supplied by Kadoorie farm and Chun Hing. The 6 pineapples have not been planted this time as it has to wait until August for buds. It is expected that by August, we can construct the planter and transplant pineapples from either the Kadoorie Farm or the market.

However, consecutive days of heavy rain had rendered the soil condition unsuitable for transplanting. The Planting Day had been postponed twice before it was finally held on 28th May. While the postponement might have driven away some of the participants, the event was still very successful with 15 participants together with Mr. Yip Tsz Lam, an experienced agriculture officer from the Kadoorie Farm, as our instructor of the day.

The planting event began with a welcome message from Mr. Davis Bookhart on behalf of the Sustainability Unit and a round of self-introductions from all the participants. Then, we watched a demonstration from Mr. Yip on how to do the landscaping (digging a hole), after which we work on other seedling locations in

pairs. Mr. Yip then continues to demonstrate the transplanting procedure and instruct the amount of fertilizers and top soil needed. The participants followed and all 15 seedlings were successfully transplanted.

Evaluation

The planting day serves as a perfect platform to gather passionate people about gardening. Thus, ideas and experience were shared and we had marked down their contacts, as they may be the future volunteers for other projects and members of the Gardening Club. Also, this event marked the beginning of community engagement in HKUST. However, the background of the participants is lacking a bit of diversity; most of them are from the Department of Environment. We need to engage more people from different backgrounds. More widespread and impactful promotion strategies should be helpful in future development of the Gardening Club. Nevertheless, as this event was carried out within exam period after delaying twice, we believe participation rate would be much higher if the event is held during semester time with less uncertainty. Finally, more thorough weather forecast should be based before choosing the date. As most of the events related to gardening are outdoors, weather is a determining factor. Indeed, after postponing for twice, it had driven away some of the participants.

Materials, tools and fertilizers are put back inside the greenhouse near the site after the end of the event.

VII. Future Development (Marvin)

A. Hand-over of project

As all of team members are going to graduate, one of urgent task is to transit the whole project to The Unit before we leave. Thus, a list of reminders to The Unit is made. It includes the action they need to take now and later, contacts of different supplies, Kadoorie Farm and detailed growth cycle, harvest forecast and other growing tips for the fruit species. We recommend The Unit can pass on this guide to the intern as well as the volunteers so that they can know more about how to manage the orchard properly.

B. Harvest Management

When harvest comes, what is the best way to deal with that? Throughout the whole year, our group had approached different canteens to ask for their opinions in helping us to sell the harvest. Café and Milano responded positively about this. Due to time constrain, we did not approach after the Planting Day. We suggest The Unit can try to find them and discuss on that as we already concrete plans on when we will have harvest and the amount of it.

Besides, on our second survey, equal portions of respondents support the ideas of donation to charities and self-eat. As the first harvest will be in December, The Unit still got time to decide which way to go for the harvest.

C. Continuous development of gardening club in HKUST

As mentioned, apart from the orchard projects, there are also a few other gardening projects on plans, for example the green wall project and roof top gardening projects at LSK. It all needs volunteers to help and make them sustainable. As in our plan, after the club is set up for a period of time, say two years, no intern would be required as we are expecting full participation from the volunteers to run the club so that more HKUST people can get engaged in the orchard and other projects inside the club as well. . This can be done adopting interesting and interactive permaculture design, learnt from Kadoorie farm. Permaculture's element is that every garden is tailor-made for the local landscape. (Appendix E) One example is Green Wall, which can be set up roughly 1000 HKD by

using recycled plastic wood, banner, waterproof grids for the frame, and fiber. As it takes up little space, while accommodating many species, this can be a good way to expand the orchard, not limited to LG7 grassland, but all around the campus including bridge link, etc. (Appendix F)

A good start is the key. We consult the experts in Kadoorie Farm and he states that when we can successfully gather a number of passionate volunteers to start on the projects. They will find the way to solve any problems that come to them. Thus, to gather the first patch of volunteers is in utmost importance and it paves the way for the continuous development of the club.

D. More species in the future

As in our original plan, herbs are also included in the orchard. Due to a higher need for maintenance, we finally choose only fruit trees in our first plan. In the future, if the club can run smoothly, we suggest the club to add more species like herbs into the orchard, or even explore more places for growing. One idea is to add passion fruits to the fence of the amphitheater. Tsz Lam in Kadoorie Farm suggested this idea as it is easy and cheap to set up. Apart from it, we expect the volunteers will propose more variety of plans to expand the whole orchard.

Also, as pineapple seedlings will be ready in August, they can be planted in proposed area with alternating layers of bricks constituting half circles. Overall, 6 pineapple seedlings will be transplanted, with seedlings possibly prepared by Kadoorie Farm. Not only this makes the fruit mix more diverse, as pineapples are one of the most popular tropical fruits, it can lift the orchard's engagement to next level.

VIII. Concluding Remarks & Key Takeaways

As the orchard is for the community use, we have gone through rigorous feasibility planning for the sites and species. The hardest difficulty we face is to define a clear direction for our project from the beginning. Through numbers of interviews, meetings and consultations with many key stakeholders, we gain ideas and we have learnt to become selective to different people's comments at times so that we can keep focusing at our goal and our next steps. As a result, stakeholder engagement took most time of the whole project preparation until implantation stage.

Our group is glad to see the project can enter the execution page by having fruit species planted in the site. We would like to thank the help from Davis and Loretta from The Sustainability Unit, our academic advisor Professor Stanley Lau and the kindest help from Tsz Lam and Carol from the Kadoorie Farm. Without their help, we cannot make a comprehensive proposal to the school and got the approval.

What differentiates a leading university from other universities is it helps the whole community with education beyond the lecture. This includes offering an interactive environment, where the community can learn about values of the nature. Our group believes the orchard can be an excellent place to let community fully immersed with the nature, as the landscape is not only green, but also productive with fruits that can be consumed right away after harvest.

To conclude, our group sees this project to be a long-lasting one. It is the time for us to pass over to the Sustainability Unit to take care of the orchard. Ultimately, we believe establishment of the orchard will be a good starting point to make our campus more sustainable and engage more people in the camps with educational places led by both students and staff.

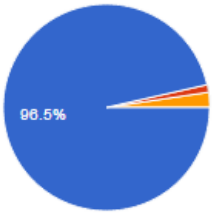
IX. Appendix

Appendix A1: 1st Survey Questions & Result

Students' Survey

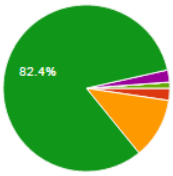
Summary

1. Are you local or international student?



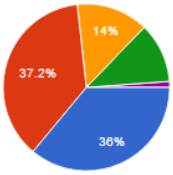
Local (Hong Kong)	82	96.5%
International (Mainland China)	1	1.2%
International (Others)	2	2.4%

3. Which of the following best describes your current education level?



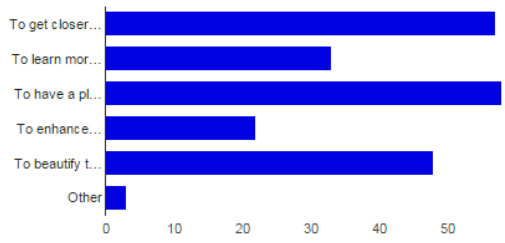
UG Year 0	0	0%
UG Year 1	2	2.4%
UG Year 2	10	11.8%
UG Year 3	70	82.4%
UG Year 4	2	2.4%
PG Mphil	0	0%
PG Master	0	0%
PG PhD	1	1.2%

4. Would you like having an orchard in HKUST campus?



Like a great deal	31	36%
Like a moderate amount	32	37.2%
Like a little	12	14%
Neither like nor dislike	10	11.6%
Dislike a little	1	1.2%
Dislike a moderate amount	0	0%
Dislike a great deal	0	0%

5. What do you like about having an orchard in HKUST?



To get closer with the Nature	57	66.3%
To learn more about the nature and trees, farming process	33	38.4%
To have a place to relax	58	67.4%
To enhance biodiversity in HKUST	22	25.6%
To beautify the campus	48	55.8%
Other	3	3.5%

6. Would you have any concerns about locating an orchard on campus? If so, please explain. (Optional)

more promotion

no

Easy to go

Should be easily access and should not be too small

1) What is the differentiation between the orchard and the organic farmland on LG 5 2) What are the educational purpose of the orchard? And who will be the one who take responsibility to it? 3) What are the values of the orchard for scientific research? (e.g. experimental purpose for bioengineering students?) 4) Would the expansion of the organic farmland be a substitute solution of the orchard? Since it is being established for quite a while

concerned about whether it will be too far to reach the orchard

Bugs and the ownership of the flower or fruit, if any

Atrract insects to the campus

We already have the glassland outside LG7,but it will attract more people other than students to here. We already have many gorgeous and beautiful view of nature around whole HKUST. The orchard maybe just a similar thing of all of these if you cannot differentiate them properly or reach the target audience and stand out the key message of having a orchard in campus

Some places where people usually pass by because no one knows IT if people do not see it frequently

Amount of bugs attracted distance from main building

Would the place be convenient to visit? I would I like to go there to relax a lot.

It may bring insects in, which I dislike most.

space

Why - what is its purpose? Education? Decoration? Where - where it wouldnt affect daily student traffic but can attract enough students visiting to achieve its purpose

the blowoff of soil particles (as HKUST is usually windy)

near to other amenities? like cafeteria?

Would the orchard need lots of space? And what is the source of budget to maintain the operation of the orchard? (Sponsorship? Fund? Subsidy?)

Not much.

The capacity and enough resources like money, manpower to maintain it?

The participation rate may be lower than expected.

There might be much more pests or birds which come to look for food, then hygiene problem would also be a concern.

the orchard should be accessible to students and staff

not enough labour to take care of the orchard

Not to far away from main campus

Where will it be located? In what way it will be planted? are there any side effects? will it affect the neighbouring environment?

Will it cause more mosquito??

If its near the academic building, I can go there more frequently.

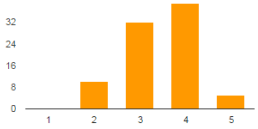
Is this idea sustainable in reality?

Attract insects

may attract a lot of insects

Yes, insects control is an important issue

7. If the orchard is established in the future, to what extent, would you be willing to participate in related activities?



Least likely: 1	0	0%
2	10	11.6%
3	32	37.2%
4	39	45.3%
Most likely: 5	5	5.8%

8. Any other conditions or incentives that could possibly motivate you in participating in our project? (Optional)

Cond 1: If I am free from the academic pressure Cond 2: If I am in need of HLTH 1010 hours

I like nature pretty much and I would like to learn something about tree growing process.

no

if -I have sufficient time - it locate near the main buildings I will join

Organic food is fairly unapproachable to students especially in UST while healthy food is actually of great importance.

Give students some fruits

The product of farm as reward Certificate as a "farmer"

interesting hands-on workshop

Group work that binds people together

Hall contribution score Activities other than taking care of the orchard

Free fruits

No

I'm always willing to participate, as long as it is easy work

if some trainings could be provided for the less experienced volunteers, it may be great esp for some works like plantation. Or else it may be harder for you to recruit workers as there may not be many people excel in garderening.

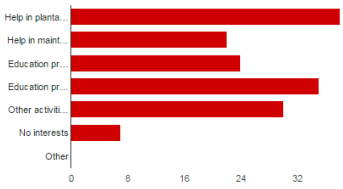
- If students could bring along their family or friends to the piece of orchard land they are responsible with, this is a kind of motivation for participation - Would it be possible to design the event in the form of competition, e.g. who grows the fruit that weighs the heaviest could gain an opportunity to work with local social enterprise in organic farming

If there is someone who could explain what's inside the orchard

peer motivation

hlth 1010 for freshman allow students to get the fruit they grow

9. In what way would you like to participate?



Help in plantation and routine management (Gardener)	38	44.2%
Help in maintenance and evaluation of trees health and growth (Monitor)	22	25.6%
Education programmes (Participants)	24	27.9%
Education programmes (Helpers)	35	40.7%
Other activities eg. parties/feast (Volunteers)	30	34.9%
No interests	7	8.1%
Other	0	0%

10. Do you have any other questions, comments or opinion for our project? (Optional)

no

I wish that we can have a orchard in UST! All the best for your project man!

The approval from ust and the marketing/promotion of this event

No

What location is suitable for orchard in hkust?

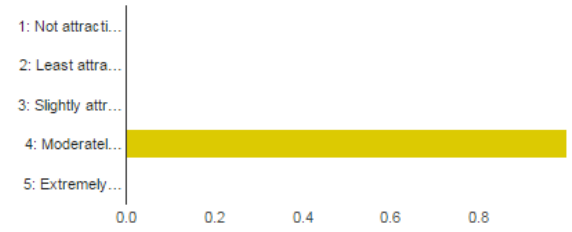
1) Is there any possibility to form a collaboration with various organizations ,for example, 本土研究社:https://www.facebook.com/localresearch 2) It is advisable for your team to conduct a focus group interview to collect further data and generate new concepts for the proposal Good luck to you all, Im a 2014 graduate

too far away

1. who will be in charge of the daily maintenance of the orchard? 2. Can students pick up the fruits and eat them? 3. what trees will be planted?

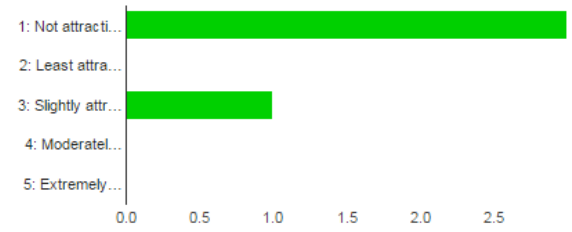
who can enter the orchard?

Personal interest [11. In your opinion, to what extent will the below incentives for participation attract you?]



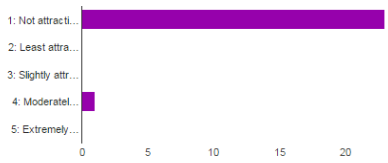
1: Not attractive	0	0%
2: Least attractive	0	0%
3: Slightly attractive	0	0%
4: Moderately attractive	1	1.2%
5: Extremely attractive	0	0%

Sense of achievement [11. In your opinion, to what extent will the below incentives for participation attract you?]



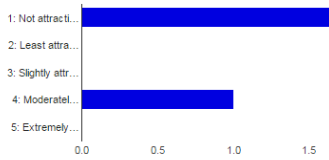
1: Not attractive	3	3.5%
2: Least attractive	0	0%
3: Slightly attractive	1	1.2%
4: Moderately attractive	0	0%
5: Extremely attractive	0	0%

Health 1010 hours/ academic credits [11. In your opinion, to what extent will the below incentives for participation attract you?]



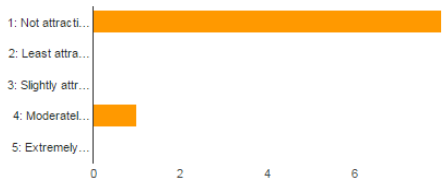
1: Not attractive	23	26.7%
2: Least attractive	0	0%
3: Slightly attractive	0	0%
4: Moderately attractive	1	1.2%
5: Extremely attractive	0	0%

Tangible rewards eg. Free Fruit/canteen coupons/reduction in fruit price (fruit orchard) [11. In your opinion, to what extent will the below incentives for participation attract you?]



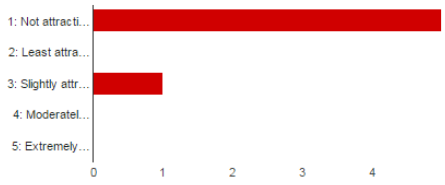
1: Not attractive	2	2.3%
2: Least attractive	0	0%
3: Slightly attractive	0	0%
4: Moderately attractive	1	1.2%
5: Extremely attractive	0	0%

Cash rewards [11. In your opinion, to what extent will the below incentives for participation attract you?]



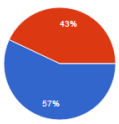
1: Not attractive	8	9.3%
2: Least attractive	0	0%
3: Slightly attractive	0	0%
4: Moderately attractive	1	1.2%
5: Extremely attractive	0	0%

Recognition eg. certificate, put a name tag on tree you planted [11. In your opinion, to what extent will the below incentives for participation attract you?]



1: Not attractive	5	5.8%
2: Least attractive	0	0%
3: Slightly attractive	1	1.2%
4: Moderately attractive	0	0%
5: Extremely attractive	0	0%

12. Based on our initial results, we may set up a Follow-up questionnaire to obtain your opinions in more details. If that is the case, would you like to receive the questionnaire?



Yes	49	57%
No	37	43%

13. ITSC (Optional)

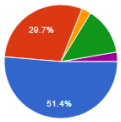
tywai
hwangaj
cwluk
ttma
kfyiu
twngac
tkchanak

Appendix A2: Staffs' Survey

1. Which department/session on campus are you from?

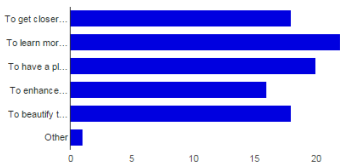
Division of Life Science
LIFS
CIVL
physics
CBME
Dept of Finance
envr
SHRL
CSE
life science
FINA
Physics
SHSS
Division of Environment
ENVR
Mathematics
fina
ECE
IPO
ENMT

2. Would you like having an orchard in HKUST campus?



Like a great deal	19	51.4%
Like a moderate amount	11	29.7%
Like a little	1	2.7%
Neither like nor dislike	5	13.5%
Dislike a little	1	2.7%
Dislike a moderate amount	0	0%
Dislike a great deal	0	0%

3. What do you like about having an orchard on campus?



To get closer with the Nature	18	48.6%
To learn more about the nature and trees, farming process	22	59.5%
To have a place to relax	20	54.1%
To enhance biodiversity in HKUST	16	43.2%
To beautify the campus	18	48.6%
Other	1	2.7%

4. Would you have any concerns about locating an orchard on campus? If so, please explain.

The upside and at the same time can be the downside of an orchard is that it can attract more kind of insects and animal to our campus. Not sure whether this will create any issue related to hygiene or not

No land for that,

Isnt HKUST already have a farming place for staff? It is a very nice idea for campus and may useful for some plant Biology course (maybe) but i am afraid the workload for maintenance of this orchard.

Space is limited on campus.

N/A

I am afraid there is no proper land space on campus for the proposed orchard.

Will they attract wild animals?

maintenance cost, insects control, and place

The flies and insects that may come along with the plants. The hygiene issues.

Not enough space

No

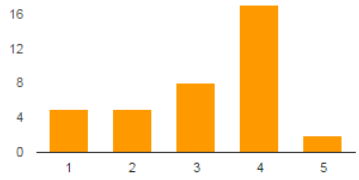
What is the cost of planting and maintaining the orchard?

I welcome communities and society to understand and respect nature more, so am all for this idea.

Not too far from buildings.

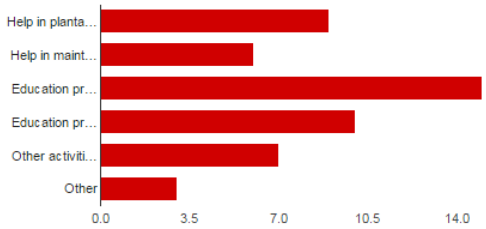
May have stagnant water?

5. If the orchard is established in the future, to what extent, would you be willing to participate in related activities?



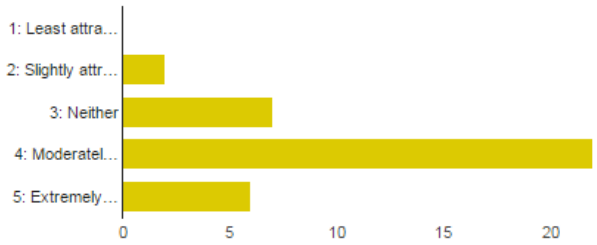
Least likely : 1	5	13.5%
2	5	13.5%
3	8	21.6%
4	17	45.9%
Most likely: 5	2	5.4%

6. In what way would you like to participate in or support related activities?



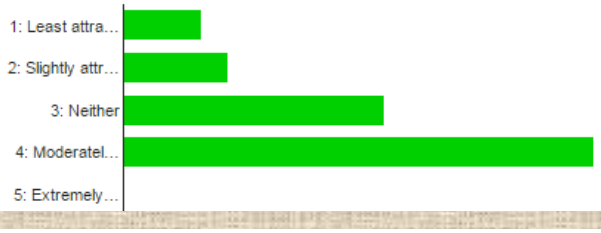
Help in plantation and routine management (Gardener)	9	27.3%
Help in maintenance and evaluation of trees health and growth (Monitor)	6	18.2%
Education programmes (Participants)	15	45.5%
Education programmes (Helpers)	10	30.3%
Other activities eg. parties/feast (Volunteers)	7	21.2%
Other	3	9.1%

Personal interest [7. In your opinion, to what extent will the below incentives for participation attract you?]



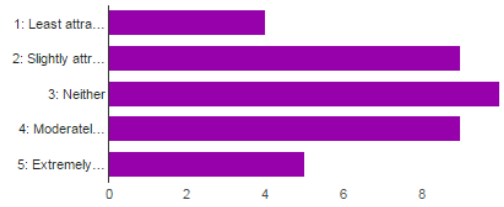
1: Least attractive	0	0%
2: Slightly attractive	2	5.4%
3: Neither	7	18.9%
4: Moderately attractive	22	59.5%
5: Extremely attractive	6	16.2%

Sense of achievement [7. In your opinion, to what extent will the below incentives for participation attract you?]



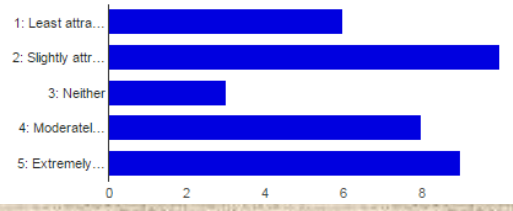
1: Least attractive	3	8.6%
2: Slightly attractive	4	11.4%
3: Neither	10	28.6%
4: Moderately attractive	18	51.4%
5: Extremely attractive	0	0%

Family gathering [7. In your opinion, to what extent will the below incentives for participation attract you?]



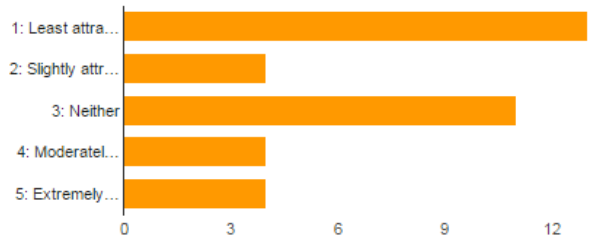
1: Least attractive	4	10.8%
2: Slightly attractive	9	24.3%
3: Neither	10	27%
4: Moderately attractive	9	24.3%
5: Extremely attractive	5	13.5%

Tangible rewards e.g. free fruit/canteen coupon [7. In your opinion, to what extent will the below incentives for participation attract you?]



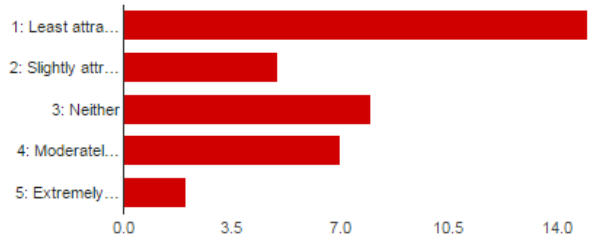
1: Least attractive	6	16.7%
2: Slightly attractive	10	27.8%
3: Neither	3	8.3%
4: Moderately attractive	8	22.2%
5: Extremely attractive	9	25%

Cash rewards [7. In your opinion, to what extent will the below incentives for participation attract you?]



1: Least attractive	13	36.1%
2: Slightly attractive	4	11.1%
3: Neither	11	30.6%
4: Moderately attractive	4	11.1%
5: Extremely attractive	4	11.1%

Recognition e.g. certificate [7. In your opinion, to what extent will the below incentives for participation attract you?]



1: Least attractive	15	40.5%
2: Slightly attractive	5	13.5%
3: Neither	8	21.6%
4: Moderately attractive	7	18.9%
5: Extremely attractive	2	5.4%

8. Any other conditions or incentives that could possibly motivate you in participating in our project?

Involving children of University Staff in the planting and education activities

provide family activities in orchard

N/A

I'd like to know that the orchard has a good chance of producing sufficient fruit to justify the effort put in. Some fruit (Lye Chi) are more attractive than others (apples and bananas) I'm part time staff and probably not on campus enough to make a significant contribution.

No

buy the fruit produce

Kids events with some educational workshops or games.

no. I like farming and planting.

9. Do you have any other questions, comments or opinion for this project?

Orchards may attract pests. Controlling pest is important as it may affect the studying/working environment in the campus.

no

Get the land, and hire staffs to maintain it.

N/A

No

Would the orchard bring in more Mosquitos and bees? If that's the case, it may need to be far from the buildings. But then it might be too far to be useful.

what kind of trees will be managed ?

Where are you going to have the orchard?

Your project would be more impressive and useful if you: 1) Do a map of the campus and, after consulting with the Facilities Office, note which areas each type of tree can grow in. 2) Get and reproduce advice on which types of fruit trees would grow well on the HKUST campus. If you would like advice from Kadoorie Farm I can ask if they will help. NB: Besides fruit trees perhaps you can grow some blossoms for CNY. 3) Forecast the volume of fruit which can be harvested once the orchard is mature and the amount of labour required at this time. Robert Gibson rgibson@ust.hk

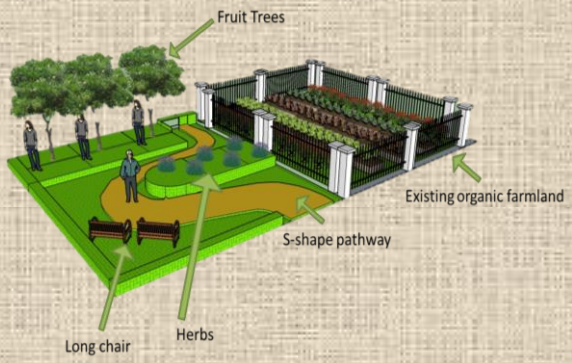
Appendix B: 2nd Survey Questions & Result

	Q1 (Vote: 1 or 0)				Q2: Frequency (Never: 0, Occasionally: 1, Always: 2)				
ITSC & contact	a. Papaya	b. Kumquat	c. Lemon	d. Guava	Papaya	Kumquat	Lemon	Guava	Q4: member (Y/N)
Student	13	4	17	4	17	12	31	12	30
Staff	21	13	32	21	16	14	24	13	29
SUM	34	17	49	25	33	26	55	25	59

Q5: Roles (1= Yes, 0=No)				Q6: Hours per week to devote				Q8: Harvest Management			
Gardening	Event Organising & Promotion	Founding Committee	Trainer for gardening	0-1 hrs	1-3 hrs	3-5 hrs	5 or more	a. Donate to Charity	b. Keep for ourselves	c. Use in canteens	d. Others (specify)
28	11	3	7	3	22	4	1	19	20	17	
22	9	2	2	14	11	1	0	15	13	10	
50	20	5	9	17	33	5	1	34	33	27	

Appendix C – Preliminary Design

C1: 3D sketch for LG7 site



C2: 3D sketch for amphitheater site

C3: 3D sketch for covered walkway

Appendix D: Cost plan for different seedlings

Fruit seedling	Unit Price ($)	Quantity	Total
Pineapple	10	6	60
Guava	70	2	140
Papaya	30	5	150
Lemon	24	5	Free
Kumquat	50	2	Free

Appendix E: Example of a design demonstrating permaculture in Kadoorie Farm

Appendix F: Example of a green wall in Kadoorie Farm