KYOTO ORGANIC FARMING INITIATIVE

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Kyoto Organic Urban Farming Initiative

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Abstract

The goal of this project aims to promote a sustainable food lifestyle to Kyoto residents through organic urban farming. We are striving to repair the broken relationship between the Japanese food landscape and Kyoto residents, as well as combat the issues of chemical farming. Through on-field observational investigations and interviewing farmers, market shop owners, and small gardeners, we gained a deeper understanding of the current agricultural and food landscape in Kyoto. In collaboration with the Midori Farm founder, Chuck Kayser, our team built a classroom to help Midori Farm educate residents on organic farming and the current issue. There is an expectation that by raising awareness, a rise in interest in Urban farming by Kyoto residents can be expected in the next upcoming years.

Acknowledgements

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We would like to extend our appreciation to all the unnamed farmers and shop owners who spoke with us and helped us gain a deeper understanding of Kyoto's organic scene.

And lastly, we extend a warm thank you to Chuck Kayser, our sponsor, for initiating this project and bringing light to the issues in the farming scene and wanting to share his knowledge.

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Executive Summary

As a result of the declining number of farmers in Japan and the rising age of farmers, a need for a younger generation of organic farmers has arisen. The lack of organic farmers in Japan has not only affected the health of people and environment but also interfered with the traditional food landscape of Japan. Agriculture was and still is an important aspect of Japanese culture. Farming in the past followed traditional agriculture techniques that were organic and sustainable.

However, currently, the approach taken by corporations involved in conventional agriculture has had negative impacts on the ecosystem and human health. The reliance on harmful practices, along with the decrease in the number of farmers, has created a need for more farmers and a different way of farming. Recently, there has been a growing organic agriculture movement in Japan dedicated to combating the impacts of conventional agriculture.

Midori Farm is a community farm based in Kyoto city with locations in Keihoku, Kyoto, and Kutsuki, Shiga. Through organic farming, educational programs, and tours, they aim to teach people how to live a more self-sustainable lifestyle and be able to produce their own food. They are working to restore the traditional food system to improve Japan's economy and environment through farm and farming methods. The farm owner of Midori Farm and our sponsor, Chuck Kayser, has requested us to help him create a classroom in which it will act as a multipurpose area where he can conduct courses about organic farming for the city of Kyoto.
This objective is captured by the following two main objectives:

1. Understanding the current farming and food landscapes of Kyoto.
    a. Identify the current state of sustainable farming in Kyoto – describing what it looks like, how it is understood, who is involved in it, in what ways and why.
2. Build a classroom which will serve as a space for learning and practicing sustainable farming in Kyoto.

Alongside the research that was conducted, we explored all avenues of Kyoto's food system through field observations that included visiting a variety of farms and markets from subsistence farms to large corporate farms. While visiting these farms we looked for specific aspects of the farm that would be categorized as organic or not and gained a deeper understanding of the specific farm we were visiting and the workers on the farm.

We observed different kinds of sustainable practices, produce being grown, the size of the land, and other relevant information. During our time at the farms, we also talked to the farmers working on the land. We were able to get some insight into their life as a farmer and learn about what they do on their farm. The information we gathered from these farm visits helped broaden our understanding of the greater agricultural landscape in Kyoto. We observed firsthand the organic and sustainable practices being practiced by farmers across Kyoto. These farms grew a variety of produce seasonally as opposed to conventional farms which usually only grew a few types of produce at large quantities with the assistance of harmful chemicals.

In addition to farm visits, we also visited a variety of grocery stores that varied from small organic farmers markets to larger chain stores. Visiting markets was essential to accomplishing our goals and objectives because they are well integrated in the Kyoto food network. Larger corporate stores typically sold non-organic produce while smaller farmers markets were full of organic produce. The large stores often relied on corporate farms to supply them with constant produce at large quantities. Organic markets typically obtain a variety of seasonal produce from organic farmers, sometimes having produce hand delivered by the farmer themselves, eliminating the need for excess packaging, handling, and transportation costs and waste. Concurrently, our team worked on creating a temporary classroom that could also serve as a multi-purpose area. Kayser is using this structure to teach people about organic urban farming and the importance of a sustainable lifestyle.

The factors that we noticed from the farms and markets show that there is a huge influence by corporate farms since the start of the 20th century when the use of pesticides spiked. This is shifting not only the way produce is grown organically, but also negatively affecting the food culture in Japan. Despite this, we also noticed that there are still people that care about organic produce and more organic stores are being opened which illustrates a growing interest in organics.

At the conclusion of our 14-week journey, we were able to establish that the organic agriculture scene in Kyoto is becoming more relevant, allowing the connection between Kyoto residents and the traditional Japanese food culture to be repaired. Following our work with farm and market observations, the information we gathered helped us gain a deeper and more expansive understanding of the Kyoto agriculture scene. Seeing the vast number of farms located in Kyoto, and the passion and dedication shown by the farmers sparked hope in combating the farming issues discussed above. The classroom we created for Midori farm helped create a direct path for Kyoto residents to get into agriculture and learn about the beneficial lifestyle of organic living. If we were to have additional time in Japan, there would be some further steps we would take to accomplish our goals.

Having more time in Kyoto would have allowed us to visit more farms and markets in Kyoto. This would help us gain a more comprehensive outlook on the agricultural scene in Kyoto which would help us make more thorough conclusions and provide concrete data on the amounts of farms and markets in Kyoto. Additionally, we would focus more on encouraging the younger generation to get involved in farming by getting involved with social media. Social media would be a useful tool to promote our initiative alongside the pamphlet and classroom we created. The classroom alongside our observational work will provide Kyoto residents with the necessary resources to practice a sustainable lifestyle through organic urban farming and reestablish their relationship with traditional food culture.

Chapter 1: Introduction

1.1 The Problem

Over the past few decades, Japan has experienced a tremendous drop in the number of farmers and farmland (Nippon, 2018). In 2015, the Ministry of Agriculture, Forestry, and Fisheries recorded a 60% decrease in the number of people engaged in agriculture in the past 30 years. As the average age of farmers increases, farms across the country are shutting down with no one to take on the responsibility of the farm (Nippon, 2018). Farming is also becoming less and less attractive to the younger generation, also contributing to the labor shortage. Not only is the labor shortage weakening the production base for agricultural products in Japan, the rapid loss of farms is also affecting the traditional Japanese agricultural landscape and traditional food relationships.

From 2009 to 2015, 30% of farms closed and were taken over by large agricultural corporations such as Japan Agriculture (JA). While large farming corporations take over farms and provide farmers with the necessary resources to produce crops to be distributed to the community, the resources being provided have shown to have negative effects. These large farming corporations promote methods that impact the community's health, Japan's environmental health, decreases crop variety, and detracts from Japan's rich food culture. Substances containing hazardous chemicals and artificially modified genes are making their way into more and more of Japan's produce and products.

Working against this trend and alongside it, smaller family farms practicing traditional Japanese agriculture can be seen as organic farms because they do not use artificial chemicals to enhance production. They use other sustainable methods such as bug nets and crop rotation.

Organic farming provides a space for natural fresh produce that does not contain toxic chemicals. Organic farming also engages the community, supports local businesses, and preserves Japan's traditional relationship with food, all positively impacting Japan's economic standing. The obstacles that Japanese organic agriculture faces can be repaired through various farming initiatives. While government intervention is one solution to combating the issues mentioned above, any person can do their part to live a greener lifestyle and participate in farming.

1.2 The Project Goal

Our goal is to promote a sustainable food lifestyle to Kyoto residents through organic urban farming. Understanding organic farming practices helps repair the broken relationship between Kyoto residents and the traditional Japanese foodscape. The project consists of two main parts that capture this goal; learning about the broader urban and organic landscape of Kyoto and creating a classroom to share knowledge and support the revitalization of sustainable farming practices at small and large scales. We will highlight what is already being done in the current organic agricultural landscape by Kyoto residents and identify what practices could

multiply and grow through knowledge sharing and practical learning which can be noticed through our sponsor Chuck Kayser.

Our sponsor, Chuck Kayser owns a farm called Midori Farm that aims to restore farmland and rural communities through organic farming, educational programs, and farm tours. Midori Farm is in an isolated location that can be difficult to visit frequently if living in Kyoto, Japan. There are people living in Kyoto that would be interested in visiting Kayser's farm but are deterred from doing so because transportation to get there is difficult and not easily accessible. The classroom in the city would bring the farm experience to Kyoto allowing for more people, especially Kyoto residents to learn about Midori farm and agricultural practices. Kayser's vision is to share his passion for organic agriculture with others. Building this classroom will help facilitate this goal as well as positively impact the community around him.

We are researching the current organic agricultural and food landscape of Kyoto during the beginning of its movement back to organic produce. This is to understand what we are contributing to and why it's important. To support this movement, our project involves constructing the classroom, which will serve as a multi-functional space where Chuck can hold workshops about organic farming for the urban residents of Kyoto and encourage their participation in the global sustainable farming movement in small and localized ways. The classroom will also help engage Kyoto residents in agriculture and sustainability practices as well as bring awareness to the growing farmer labor shortage and its country wide effects.

Figure 1: *Image of Midori Farm*

1.3 The Impact

First, we will address our physical impact by leaving a classroom behind. This classroom will be the basis for our sponsor to teach his class. Through this class, the residents of Kyoto can be educated about the current issues with chemical farming and how it's unsustainable in addition to having hands-on lessons on organic growing so they can do it at home.

Our on-field research contributes to the lack of scholarly information on Japan's current agricultural landscape. Many of our observations and findings could not be read about and would

require people to be in Japan. These observations can be referenced in the future to obtain background knowledge about Kyoto's food landscape to create informed plans.

Our pamphlet is an easily distributable source of information on the harmful impacts of chemical farming and the declining number of organic Japanese farmers. It includes both facts and suggestions to live more sustainability such as where to shop and eat.

Chapter 2: Background

2.1 Introduction

The approach taken by corporations involved in conventional agriculture and farming has negatively impacted all domains of the ecosystem, including human health in both urban and rural areas in Japan. The reliance on harmful agricultural practices along with the decrease in the number of farmers, has created a need for more farmers and a way to farm differently. Recently there has been a growing organic agriculture movement dedicated to combating the impacts of conventional agriculture. Implementing a temporary classroom in the city will help increase the population's knowledge of sustainability and farming techniques; reducing the issues associated with the lack of farming in Japan.

2.2 History of Agriculture in Japan

2.2.1 Early Agriculture in Japan

Agriculture is one of the oldest professions in Japan. The people living in rural Japan worked together to create a flourishing economy based on farming and trading (Tsutsui, 2009). Rice and vegetables were used as a form of currency where people could trade with one another. These farmers also worked together to create waterways and canals so that they could extend to more areas and create more farming land (Tsutsui, 2009). This expansion of land through farming bonded people together and created societies, villages and eventually governments. Early on, production was slow, wasteful, and damaging to the land due to lack of developed farming skills and extensive farming knowledge. As time progressed farmers learned new techniques that helped improve production. These techniques included but were not limited to water irrigation systems, crop rotations, bug netting, and more. Cities like Osaka and Kyoto grew very large as a cause of this and became main areas for farming and trading (Tsutsui, 2009).

Japan is known for growing crops such as barley, oats, wheat, and rice (Sandene, 2012). The growth of these crops and the techniques for these largely came from central Asia along with Buddhism (Cartwright, 2022). Buddhism is important in this context as it influenced the Japanese people to rely on a diet that consisted mostly of vegetables and seafood (Cartwright, 2022). Food and agriculture are linked together from an early time in Japan.

Approximately 12% of the Japanese land is arable and the number has been declining over the years as shown in Figure 2.1 below (Sandene, 2012). Much of the farmable land was damaged from natural disasters and bad farming techniques. Maintaining abundant and usable farming land is important to sustaining an economically strong Japan. Kyoto city on its own showed a decline of 10% in agricultural land which mostly became residential areas (Oda et al., 2018).

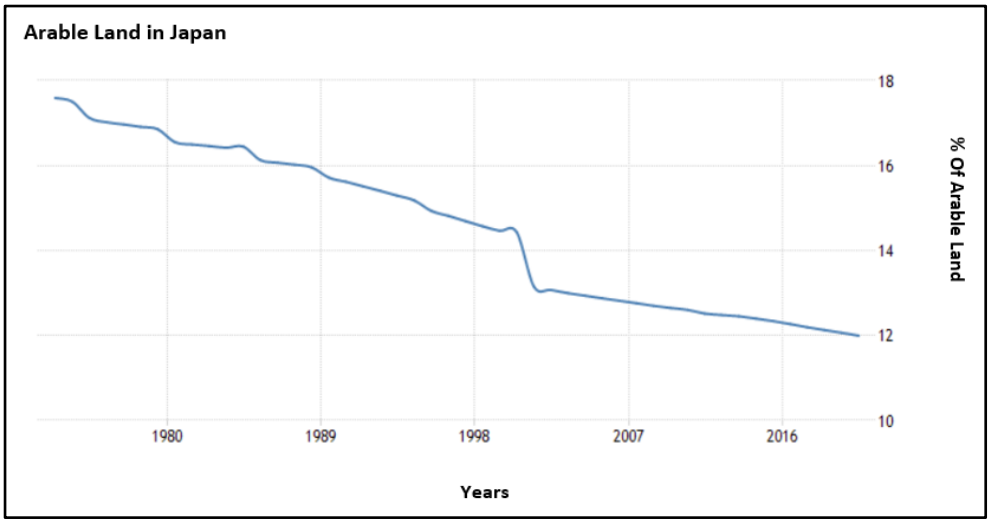

Figure 2: *Image showing the percentage of arable land in Japan over the years*

Farmland Type	Farmland in 2007 (ha)	Converted to Non-Ag Land Use (%)	Converted from Non-Ag Land Use (%)	Converted to Other Farmland Type (%)	Converted from Other Farmland Type (%)	Farmland in 2017 (%)
Dry fields	717.37	−16.6	0.6	−0.1	1.0	84.9
Rice paddies	1088.42	−8.1	0.2	−0.8	0.1	91.4
Orchards	80.58	−1.4	1.3		0.3	100.2
Allotments	5.41				14.0	114.0
Tea plantations	4.74					100.0
Total	1896.52	−11.0	0.4	−0.5	0.5	89.4

Figure 3: *Image of the agricultural land changes in Kyoto from 2007 to 2017*

2.2.2 Modernizing Agriculture in Japan

Over the centuries, Japanese farmers have developed a unique approach to agriculture that is known for its efficiency and sustainability. In recent years, Japan has undergone a process of modernization in its agricultural sector, with the adoption of new technologies and farming methods. One of the key aspects of the modernization of Japanese agriculture has been the use of technology. Japanese farmers have embraced new technologies such as precision farming, which uses sensors, GPS, and vehicles that are capable of plowing and harvesting to improve the efficiency and productivity of farming operations. On the other hand, practices like monoculturing, pesticide use, and toxic chemical fertilizers also increase yield and productivity of farms while harming the nature and humans around (Takagi, 1977). This has allowed Japanese farmers to increase their yields while using fewer resources and reducing their environmental impact. Another aspect of the modernization of Japanese agriculture has been the adoption of new farming methods. For example, many Japanese farmers have switched to using more

efficient irrigation techniques, such as drip irrigation and sprinkler systems, which help to conserve water and improve crop yields. In addition, many farmers have started using polytunnels and greenhouses to extend the growing season and protect crops from extreme weather. The modernization of Japanese agriculture has also been supported by the government, which has provided funding and other support for farmers who are looking to adopt new technologies and farming methods. In addition, the government has worked to improve the overall infrastructure of the agricultural sector, including investing in transportation and distribution networks to help farmers get their products to market more efficiently (Nagami, 2010). This has not only benefited farmers, but it has also helped to support the broader economy and ensure a stable and reliable supply of high-quality food for the Japanese people.

2.3 Current Food Distribution of Japan

In order to understand the full food landscape and network of Kyoto, we must look at how produce gets from the farm to the consumer. This will help us understand why the problem of chemical farming is so prevalent in Japan now. Farmers are the breadbasket of Japan with all domestic food originating from farms like most countries. Japan's produce is grown independently by many individual small farmers and is overseen by Japan's Agricultural System (JAS) under the MAFF Act on Japanese Agricultural Standards, issued on May 11, 1950, after WWII. This Act is applied to foods, drinks, and other processed goods (MAFF, 2017).

JAS provides farmers with seeds, fertilizers, and pesticides while the farmers perform the labor of farming and sell their crops back to JAS. JAS then distributes the produce to large grocery chains, such as Fresco, which then sells the products to the customers. Small farmers also sell products directly to their community through personal connections without going through all the middlemen. JAS also provides agrochemicals such as pesticides, chemical fertilizers, and GMO seeds and encourages farmers to use them for higher production. Due to this pressure and low effort of using these damaging products, farmers have turned to them in order to make a greater living leading to the environmental and cultural damages.

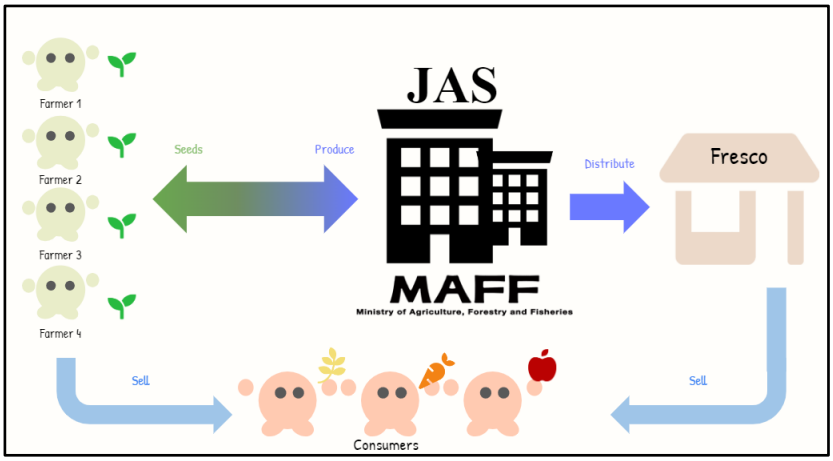

Figure 4: *Infographic of the food distribution system in Japan*

2.4 Types of Farms

Farms differ in size and agriculture techniques used to plant, grow, harvest, and distribute produce. Another distinction is the amount of money being made annually. It is important to take note that each type of farm will later be referred to in the following three categories - subsistence farms, traditional farms, and corporate farms.

2.4.1 Organic Farms

According to the Japanese Ministry of Agriculture Forestry, and Fisheries (MAFF), organic agriculture is defined as farming methods that reduce the load on the environment caused by agricultural production and eliminating the use of chemically synthesized fertilizers, pesticides, and genetic recombination technologies (MAFF, 2022). The MAFF emphasizes the importance of maintaining the natural cyclical function of agriculture. In order to promote this, the MAFF recognizes organic agriculture as a “holistic production management system which promotes and enhances the agroecosystem health, including biodiversity, biological cycles, and soil biological activity” (MAFF, 2022). Organic farming practices are centered mostly on transforming and growing land with just natural resources including air, water, and soil. It aims to provide healthy and nutritious crops while also protecting the environment from pollution and degradation. Organic Farming is based on the theories of British botanist Sir Albert Howard, who spent a significant portion of his career in India. Howard discusses the foundation of organic farming in his book "An Agricultural Testiment." He explains that healthy soil is used to promote crops, the use of permanent ground cover, and careful usage of local resources. According to Howard, maintaining soil fertility is the most crucial requirement for any long-term farming system and is also crucial for the wellbeing of all living things, including plants, animals, and humans (Iberdrola, 2021). Today, organic farming incorporates both successful agricultural methods from the past and technical advancements related to smart farming as well as current understanding of soil fertilization and pest control.

In order to be a certified organic Japanese farmer, you must meet all the requirements and standards for organic farming defined by the MAFF. A third party will evaluate whether or not a farmer is taking the necessary measures to not use chemical substances or recombinant DNA technologies. It is required of farmers to keep detailed production records and work on average 1.6 more working hours than a conventional farmer (Kilcoyne, 2022). These requirements require more labor, time, and money, deterring farmers from becoming organically certified. Once a farm is certified by the Japanese Organic Regulation (JAS), the farm is free to use the Organic JAS logo. It is prohibited for uncertified farms to sell produce labeled “organic” with the JAS organic logo. However, even if a farm is not JAS certified it can still be organic.

Figure 5: *Image of the JAS Organic Symbol*

2.4.2 Natural Farms

Natural farming is a subset of organic farming as it does not erode the land or use agrochemicals. Natural farming is a method spread by Masanobu Fukuoka which involves no chemicals, no fertilizers, and not even tilling of the soil. The seeds are just scattered about the field and watered by rain. This method focuses on reading nature's cues and produces yields equal to that of conventional farming (Fukuoka, 1975). It does not use any modern technologies such as tractors and everything is done by hand. Natural farming inspired a reawakening of organic farming in Japan.

2.4.3 Conventional Farms

Conventional farming uses harmful chemicals to fight off pests and weeds as well as provide the plant with nutrition and promote plant growth. There are many negative side effects to conventional farming that organic farming tries to reduce and completely eliminate. Conventional farming causes increased "greenhouse gas emissions, soil erosion, water pollution, and threatens human health" (Rodale Institute, 2018). After WWII, Japan took inspiration from the United States and began practicing chemical farming over traditional farming. (Fukuoka, 1975). On the contrary, pesticides used in conventional farming have benefits too. When pesticides were used in conventional farming, it showed that "field productivity increased by about 35%" (Takagi, 1977). Along with more produce the labor required to grow products decreased as well. "Data relating to the number of working hours for rice production showed that labor productivity became 10 times higher by using herbicides in Japan" (Takagi, 1977). Despite the benefits of using pesticides in conventional, the negative side effects, such as increased greenhouse gas emissions and threats to human health cannot be ignored.

2.4.4 Community Farms

Industrial agriculture is the production of crops and animals on a large scale, typically involving the use of chemical fertilizers, antibiotics, and genetically modified crops (Union of Concerned Scientists, 2008). Community farms are multifunctional farms where the land is regulated by the community rather than owned privately. A group of people forming a community, agree to share land to use for agricultural purposes usually to provide food for the local community. Community farms typically use sustainable agricultural practices (Foodlands, 2022).

2.4.5 Small Farms Vs Large Commercial Farms

Small farms make significantly less produce than large industrial farms a year and take up less land. Large commercial farms are when food and produce are produced for sale. In Japan commercial farms are defined as "those cultivating > 0.3 hectares of farmland *OR* earning more than JPY 500.000 (€ 4.250) per year from sales of agricultural products" (Miniesterie van Landbouw, 2020). Majority of small farms in Japan are family owned, but unfortunately the number of these farms have been declining over the past several decades.

2.4.6 Uncategorized Farms

Lastly, throughout Kyoto, there are several farms that do not fit into any of these categories. Many Japanese farms are family farms that follow traditional Japanese agricultural practices. These kinds of farmers often work with smaller areas of land next to their houses, either only producing produce for their friends and family and/or selling their produce to the nearby community. Although these farmers are not organically certified by the JAS, traditional agricultural practices typically do not use chemicals or pesticides and follow relatively sustainable farming techniques.

2.4.7 Issues within Contemporary Agriculture in Japan

Industrial agriculture, which relies on large-scale production and the use of chemical inputs such as pesticides and fertilizers, has become a major concern in Japan. The effects of agrochemicals have led to environmental degradation in soil, water, and a loss in biodiversity. The overuse of chemical inputs has resulted in the contamination of soil and crops, leading to health concerns for both farmers and consumers (Takagi, 1977). In addition to the immediate effect, industrial agriculture has led to the loss of traditional farming and a decline in small-scale farms which negatively affected rural communities in Japan. As a result of this, there have been calls for the government to support more sustainable and environmentally friendly forms of agriculture (Nagami, 2010).

2.4.8 Effects of Pesticides in Chemical Farming

Pesticide use in Japan has spiked after WW2 boosting food production and reducing the labor required for farming. According to the National Institute of Agro-Environmental Sciences, pesticides increased Japan's yield of agro-products by 35% and the work necessary to grow the products decreased by 10-fold (Takagi, 1977). Even though pesticide use seemed very effective in stabilizing food supply, quality, and appearance, there were many risks associated with it. This new practice of using chemicals for farming was disturbing ecosystems, polluting nature, and harming humans. As the Japanese consumer started to realize the negative effect of pesticides on people and nature, farmers slowly started cultivating their farm products without the help of agrochemicals (Takagi, 1977). Since then, Japan's use of agrochemicals has been slowly declining to this day.

2.4.9 Effects of Agrochemicals on Humans

With the use of agrochemicals becoming more widespread and openly used, the effects on humans have become clearer. These agrochemicals not only affect the plant and the consumer but also affects the farmers spraying them. An example of poisoning due to agrochemicals has been seen in "Sarin mass-poisoning incident in Tokyo in 1995 in which 12 subway passengers were killed and at least another 5000 poisoned" (Nagami 2010). The incident was caused by Sarin gas which was originally intended as a pesticide.

Another incident was reported in 2008 when insecticides were deliberately added to fried Chinese dumplings. The insecticides caused mass chloropicrin poisonings in the city of Kumamoto. These incidents helped surface the harmful effects of pesticides on humans and expedited a movement against harmful chemicals. Most of these pesticides were historically used in the Holocaust and World War II (Nagami, 2010). To combat the effect of pesticide poisoning and regulate its use, the Japan Rural Medicine Study Group (JARM) was founded in 1965. In 1966 JARM organized the Pesticide Poisoning Study Group to focus on pesticide research. These organizations together discovered and disclosed multiple different pesticides responsible for multiple farm workers and consumers being poisoned all around Japan.

2.4.10 Effects of Agrochemicals on Nature

Not only do agrochemicals affect humans, but they also affect whole ecosystems when they are used. The pesticides that we currently use can travel all the way from the farmlands to the water we drink and the fish we eat. During the application period of pesticides one part of the pesticides remain in the atmosphere gradually falling to the soil and aquatic environment with rain and dust contaminating our soil and food in the process (Takagi, 1977). Some pesticides we use like chlorothalonil inhibit the growth and activity of microorganisms which over time leads to soil degradation. By using these kinds of chemicals, we kill the nutrients in the soil making it ineffective for the next harvest season. This leads the farmers to buy more fertilizer to make their soil more nutritious which creates an artificial cycle for farming instead of a natural one. When farmers use pesticides, they are not affecting the crops or the weeds, they are inadvertently affecting non-target organisms all around. Nature has its cycle of replenishing itself and when strong agrochemicals mix into the equation it starts to break the cycle or it joins in the cycle as a pollutant. Over time, the acute toxicity of pesticides has been significantly reduced as people and governments have become aware of the harmful effects of these chemicals. As a result of this increased awareness, efforts have been made to decrease the use of pesticides and to develop safer, more environmentally friendly alternatives.

2.4.11 Effects of Monoculture

Monoculturing is the process of only growing one type of crop on a field. A field growing only one species of a specific type of cabbage would be a monoculture, whereas a field that grows various types of cabbage would not be. Under the MAFF, many different crops have been standardized to monoculture (Nihon Nogyo Shimbun, 2003). It is a byproduct of industrial

chemical farming. While there are hundreds of varieties of cabbage, tomato, and radish the JAS system only purchases three or four of them from farmers to be sold. This encourages farmers to abandon their previous biodiversity of crops to only farm what is profitable. This itself has many detrimental effects; monoculture means little resistance to diseases or fungal infections. The Irish potato famine, where the lack of diversity in potato varieties allowed a single blight to devastate the crop, serves as a cautionary tale about the dangers of monoculture. By supporting organic farming, the methods originally used before the introduction of chemicals, Kyoto would gain more biodiversity in its food supply as it once had and reduce chances of an agricultural disaster.

The unfortunate truth of monoculture goes beyond the field. It also affects Japanese culture. There is less variety in food with less variety of crops to grow. For example, traditional Kyoto cuisine includes many different vegetables beyond the standardized varieties but since the implementation of JAS the variety of food has decreased.

2.5 Solutions and Alternatives to the Problem

2.5.1 Government Intervention

To combat the issues of the declining farming population in Japan, the Japanese government has set many initiatives in place to encourage and motivate people to get involved in agriculture. The government has implemented many financial educational support systems targeted towards those 45 years and younger. By training young prospective farmers, the government hopes to "help farmland from falling into disuse, bolster rural populations, and stabilize domestic agricultural production capacity" (McGreevy, 2018).

The government provides free tuition, interest-free loans, and even stipends for prospective farmers enrolled in agricultural schools signed up for training. Careful efforts are taken to match new farmers to communities with available farming land and housing to best ensure a smooth transition into rural community life (McGreevy, 2018). This agriculture initiative has proven to be successful with over 43,500 people under the age of 45 enrolled in the "Young Farmers Fund". The government's efforts promoted agricultural life to the younger Japanese population and helped trigger an interest in farming and rural living.

2.5.2 Sustainability

Although the above tackle the population issue with farmers, our project is more focused on the sustainability of food culture and sustaining positive cycles in the environment. In order to achieve this, we believe the solution lies in a principle of sustainability, that is to maintain or improve the area one is working in and all it connects to. "Sustainability is usually defined as the processes and actions through which humankind avoids the depletion of natural resources, in order to keep an ecological balance that doesn't allow the quality of life of modern societies to decrease (Youmatter, 2021)."

An approach to achieve sustainability and tackle the threats of chemical agriculture is to farm organically. Typically, the word "organic" implies anything that comes from nature. The general understanding of what the word “organic” means is no synthetic fertilizer and no chemical pesticides, but specifically, it means using methods that do not drain the land of its nutrients leaving it farmable for the future.

Organic as a concept is becoming more well known among Japanese consumers, along with other categories including free-from, natural, and vegan. However, while the terminology may be new, the Japanese people have been farming and consuming organically for tens of generations. It was just traditional farming methods. The introduction of chemical farming from the western world caused a shift away from traditional methods of farming. The word organic is used to distinguish between farming that uses man-made chemicals that diminish the nutrients of the soil and other methods. Previously, all farming was “organic” so there was no need for that term. There is a need to revitalize organic traditional agricultural practices to restore the connection people have with food that was lost due to the side-effects of agrochemicals such as monoculturing.

The self-sufficient cycle can be defined as a repeating process without the need for unnecessary external input (Sayner, 2022). This can take many forms such as a person being self-sufficient and acquiring all their needs through their own efforts without relying on others. The one our project will be promoting is the self-sufficient food cycle. The primary idea of this is to use the seeds and fruit from one generation to foster the generation of the other. This is a way of organic farming eliminating the use of drastically genetically modified plants, used in large food companies. Genetically modified plants typically only produce fruit for one cycle leaving the seeds unfertile. Self-sufficient food cycles limit the waste of resources and do not rely on imports from another source, thus sustaining themselves.

2.6 Similar Project in the Past

Urban farming is a relatively new idea, yet it has had very successful reactions in past projects. A school in Bronx, New York converted a portion of their school grounds into an urban farm which was run by a few teachers who taught their students how to grow fresh produce. The students also sold their fresh produce and learned about how growing organic food can be a profitable business (*In New York City, Bringing Urban Farms into the Classroom*, 2016). The students were interviewed, and they said that they enjoyed learning about farming in the classroom and that it was a new experience from a regular classroom. The Medical University of South Carolina found that urban agriculture can be a way to combat many modern health conditions, stress, and consumption of fatty and inorganic food. The school dedicated a portion of their campus to create a living farm garden which would be used as a classroom to teach students about hands-on farming (Johnson, 2013). The school has held over 200 classes with over 1700 participants there now and has had very positive feedback on the benefits of the class. Many students and staff had indicated that being in the classroom was a great experience as people got to work with their hands, learn about farming and connect with the community and

make friends. Similarly, to our project, these projects mean more than simply learning about farming in an urban area. These projects show that farming is calming to the mind and body. The schools also participated in a sustainable form of farming by using organic fertilizers without added chemicals (Johnson, 2013). Chuck Kayser runs his farm in a similar manner and wants to teach his students exactly this.

2.7 Classroom Requirements and Constraints

As our group investigated the broader urban and organic agricultural landscape of Kyoto, we at the same time had to focus on classroom construction. Chuck is a local organic farmer, who had specific needs and requirements for the classroom in order for it to fulfill its purpose. He wants an American style classroom with Japanese features. The classroom needs to have tables with chairs, a desk with a whiteboard, shelving, and space for demonstrations. All these aspects of the classroom will help contribute to a space of learning, creating, and experiencing. Kayser will be able to teach others about basic farming theory, help others grow seedlings, and show people what it takes to be an organic farmer on any scale.

2.8 Japanese Urban Design and the Use of Space

Japan is a very mountainous country with little flatland, forcing most of the population to reside in flatter areas. About 80 percent of Japan's land area is mountainous and about 65% of the land area is covered by woodlands (Petry, 2003). Much of Japan's natural landscape is well protected. The preservation of Japan's surrounding nature has given the Japanese a unique perspective on the use of land and space. It can be noticed that Japan has smaller spaces, often accepting the idea of multipurpose spaces. Because of this, many homes, businesses, and restaurants are typically small, close together, and condensed in small spaces modeling after the idea of concentrated settlement. They have a different meaning that sees private and public spaces existing in harmony (Gottman, 1981). The structure we are creating emulates the use of small and multipurpose spaces. While the space is mainly used for educational purposes, it will also serve as a multipurpose space to facilitate seedling growth for Midori Farm, act as storage for farming materials, and so much more. Although the space seems relatively small, standing at 3m high at its tallest point and about 4m wide in both directions, the classroom fits in with the rest of the smaller buildings in the surrounding area.

2.9 The Kyoto Context

2.9.1 Kyoto Prefecture Vs Kyoto City

Kyoto is commonly referred to as both the prefecture and a city. For clarity, Kyoto city is located in Kyoto prefecture. Although our focus is mainly on Kyoto City, the city gets its food from Kyoto prefecture which makes it a vital part of the Kyoto organic scene. In this paper, we will often use Kyoto interchangeably between these two land areas. This is because the two

landscapes are so interconnected that simply isolating the city from the prefecture would not provide a holistic overview of the information we are trying to gather.

Figure 6: *Labeled Map of Kyoto Prefecture and Kyoto City*

2.9.2 Current State of Kyoto Farming

Farming and agriculture in the city of Kyoto is not as large and effective as it once was. There are many efforts being done by people and the government in order to ignite a new flame with hopes that a new age of farming will begin and restore Kyoto to its traditional ways of farming and food consumption.

Kyoto was once a prosperous farming and agricultural area but is now more industrialized with a large amount of the area covered in buildings and city infrastructure (Sandene, 2020). In the 20th century agricultural land fell by 20% and the number of farmers declined by over 60%. Furthermore, the current average farmer population is aging which can cause a larger decrease in agriculture production (Sato, 2001). The city is projected to grow even smaller in the years to come with a population decline of 13%. With this decrease in population, the expectation was that there would be an increase in farming due to more available land. Conversely, it was found that in the past decade Kyoto saw a decrease in farmland as well (Oda et al., 2018). Kyoto is facing rapid decrease in both population and farmland which puts it in a concerning state.

As explained earlier, both the use of agricultural land and the number of people practicing urban agriculture decreased by more than half. The bigger food production companies that use chemicals to mass grow vegetables also make it harder for the local farmers to make a

profit as those big corporation farms have lower costs and higher quantities of produce. (Moreno-Peñaranda, 2011). The most effective way to combat the aging farmers population is to inspire and educate the younger population to farm and grow their own food. Promoting farming in school and in areas such as Chuck's classroom are a start, and over recent years Japan has seen a growing interest in people wanting to farm with a survey in Tokyo showing that over 85% of the city's population wanted to see an increase in farming (Moreno-Peñaranda, 2011).

The Japanese government has been pushing for an increase in farming to combat the declining numbers in agricultural and food production. They have focused on preserving land, extending production in rural areas and sustainable self-sufficient food production (Sato, 2001). The idea of self-sufficient production and land utilization is seen in cities like Kyoto where food production and small farms can be seen around the city. Chuck's classroom is also pushing urban farming so that people can utilize their small yards, driveways, gardens, or even windows to grow their own food. Whether they grow food for personal use, share with their community, or plan to partner with grocery stores, this can help combat the declining numbers in farming. People in cities like Kyoto and Osaka also create small neighborhood farms (Hara et al., 2018). Farms can be seen in all shapes and sizes in cities like Kyoto whether it is a few plants on the yard, a neighborhood farm, or a huge experimental farm like Kyoto university's experimental urban farm. Some of the bigger urban farms in these cities fit under Urbanization Promotion Areas (UPA).

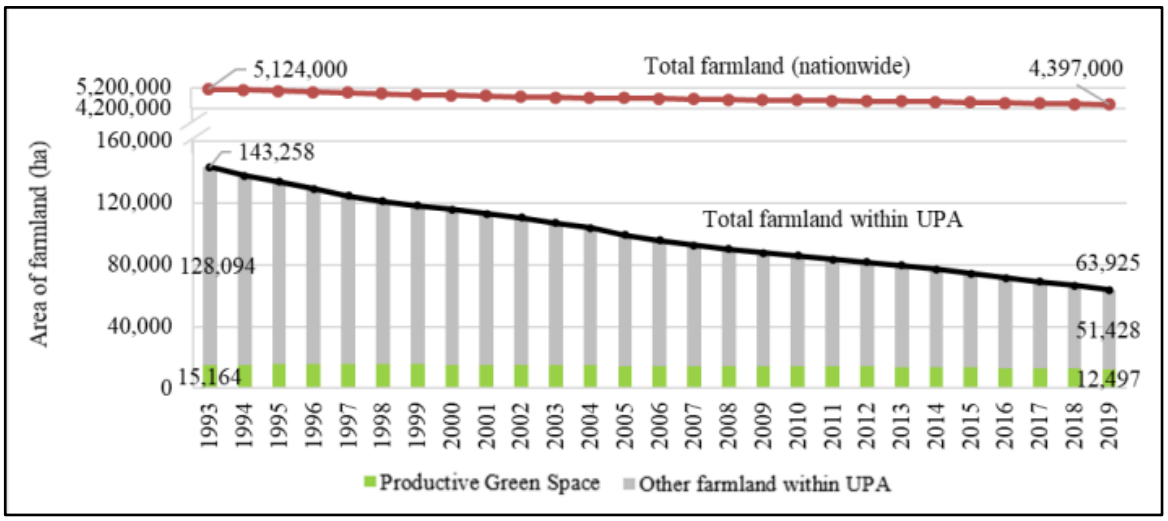

Figure 7: *Image outlining UPA farmland use in Japan over the years*

Urbanization Promotion Areas are areas that categorize all the urban growth spaces in Japan. This can be seen by the graph in Figure 2.10 that there has been a decrease in urban farmland over the recent 20 years. The government has also played a big part in trying to improve farming in cities. All people falling under the UPAs protected farmland area receive tax breaks which can be encouraging to people wanting to get involved in farming (Satake, 2022).

Since 1991 Japan has also passed the Protective Green Land Act which protects government protected farm zones by heavily taxing anything that's not a farm.

Some Kyoto growers put a lot of time and effort into growing perfect vegetables and fruits organically which are then usually sold in stores around the city. The vegetable production has helped forge a better economy with growers selling to local restaurants and farmers markets which in turn helps with tourism and causes the economy to flourish.

2.9.3 Food Culture of Kyoto

The Japanese people have a unique relationship with their food. A traditional Japanese meal consists of many small individual plates on a tray held separately from each other. Although all dishes are eaten by the end of the meal the individual plates are to prevent flavor mixing/contamination. Japanese people believe each ingredient has its own integrity and its flavors should be respected and savored rather than masked or overpowered. Here, it's easy to see how people respect or even revere food. To waste food is seen as highly disrespectful to the ones who prepared your food and the ones who grew it. Through our observations, Kyoto residents almost always leave their plates clean and polished at restaurants.

Figure 8: *Image of Obanzai Meal*

In Kyoto, people will wait hours in line for a restaurant that only seats six at a time. Japanese people place a much higher importance on the meaning of food. Food means more than just filling your stomach, it's also about history and tradition. Many of these shops have been passed down generation to generation, preserving the original cooking techniques. To dine at these establishments means to live the experience that many have before you while enjoying delicious cuisine.

Fruits are another example of food having meaning beyond their edible value as they are often given as formal gifts (Nippon, 2015). The more effort it took to produce the fruit, the higher its value. Japanese people view fruit differently; while we in the States would look at a

$800 bunch of grapes and see nothing more than its face value, the Japanese place more value into the fruit than its nutritional and consumption value. Pricy fruit represents luxury, opulence, and hard work. This is similar to why people buy thousand-dollar sneakers despite the performance being the same- there's cultural value in it. As a society there was an unspoken agreement that this object or idea is valuable. For Japan, that is food and tradition.

Figure 9: *Image of a well packaged expensive melon*

2.9.4 Midori Farms

Midori Farms is located just outside the city of Kyoto, Japan, and it is owned and run by Chuck Kayser. Kayser started off this idea initially as a hobby back in 2009, but eventually quit his job as a teacher to become a full-time farmer after being inspired by the nature around him. Kayser was originally an English school teacher and worked in that profession for about 20 years. Midori farms is known for producing fresh produce and selling it to customers. Kayser is able to grow over 50 different plants on just 2000 sq meters a year which he sells to customers most of the year. Midori farms has its own website and social media platforms in which people are able to order fresh and seasonal organic produce (Kayser, 2022).

Midori Farm has a much grander goal than simply selling fresh produce. Kayser is trying to use his farm and farming methods to teach people how to live a more self-sustainable lifestyle and be able to produce their own food. Kayser sees himself as a self-taught farmer and believes that everyone can do what he did. He truly loves farming and believes that it is a fulfilling and healthy way of living. The website put in place for Midori farms allows people to sign up for different events, gardening lessons, and even volunteer, in order to get a better understanding of farm life. Kayser believes that organic food is only half of his teaching with the other half being environmental and social benefits. These benefits are described by Kayser as cleaning the environment, soil, and connecting to nature once again (Kayser, 2021).

Chapter 3: Methods

3.1 Brief Introduction

As mentioned previously, the goal of this project is to promote a sustainable lifestyle to Kyoto residents through urban farming by constructing a classroom for Midori Farm. Consequently, this would repair the broken relationships between people and their foodscapes. The goal had changed significantly from when we first started the project. Originally, much of our focus was directed towards classroom construction. More information on this can be found in Appendix A. Being in Japan allowed our project to evolve. During the end of the first term, we began to broaden our focus and think more about the organic agricultural landscape in Kyoto. Once in Japan, it became clear that we should direct much of our research to this topic and form a connection between organic agriculture in Kyoto and the Midori Farm classroom.

Our project was driven by the following objectives:

1. Understanding the current farming and food landscapes of Kyoto.
    a. Identify the current state of sustainable farming in Kyoto – describing what it looks like, how it is understood, who is involved in it, and why.
2. Build a classroom that will serve as a space for learning and practicing organic farming in Kyoto.

These objectives were accomplished through secondary research, informal interviews, and observation.

3.2 Objective 1: Understanding the Current Farming and Food Landscapes of Kyoto.

3.2.1 Collecting Information

The first objective was to gather more information on the issues described throughout the background chapter. The main focus of this stage was to collect data, create surveys, and find people to survey and interview.

3.2.2 Research Phase

The research began with looking at articles about the history of organic farming, food culture in Kyoto, and general information related to the agricultural landscape in Kyoto. This allowed for a better understanding of the farming situation in Kyoto. Acquiring initial information helped us gain a better understanding of what to expect and what to look for when conducting observations.

3.2.3 Observation

To supplement our understanding of the agricultural landscape in Kyoto, we performed observation-based field research in and around Kyoto prefecture. It is important to note that our team performed observations during the autumn season in Japan, so our physical observations of plants correlate to this due to the importance of seasonality.

To truly understand the farming scene in Kyoto, we visited a variety of farms, markets, grocery stores, and other areas related to agriculture. The farms, markets, and grocery stores visited were found through web-based research, as well as by exploring the city of Kyoto on foot and on bicycles. Some places we visited as a team and others we visited in small groups of two or three. The purpose of dividing our team into groups to visit some of the locations was done in order to distribute our time efficiently and ensure that we could visit enough places to have reliable data. This was also done so we could allocate some days to building the classroom and collecting farm data simultaneously.

We visited markets and grocery stores to better understand the distribution and popularity of organic food in Kyoto. We looked to see whether products being sold were organic and if there was any information on the farmers who grew the produce. We also looked to see how much of the produce being sold was organic and how expensive it was. During these visits, we also conversed with various shop owners, cooks, and residents about how they feel about organic produce and if they would prefer it over other produce. Speaking to locals and observing multiple facets of Kyoto's food landscape is critical in understanding why our project is important and what impact it will have. This stage was very important to learn about the organic food atmosphere of Kyoto beyond just the farms and farmers. When looking at farms, there were also certain items we specifically were looking for. These items are listed below. Figure 3.1 shows the places that our team visited while in Japan.

Observation Markers:

- The kind of produce being grown and how much
- The number of workers
- The size of the land
- The kind of machinery and tools
- The amount of greenhouses
- Sustainability practices
- Any other items that were noteworthy

While at the farms, during our observations, we conducted informal interviews and had conversations with the farmers. This was done to learn more about their farm and truly understand what they were trying to accomplish and how they contribute to the food scene in Kyoto.

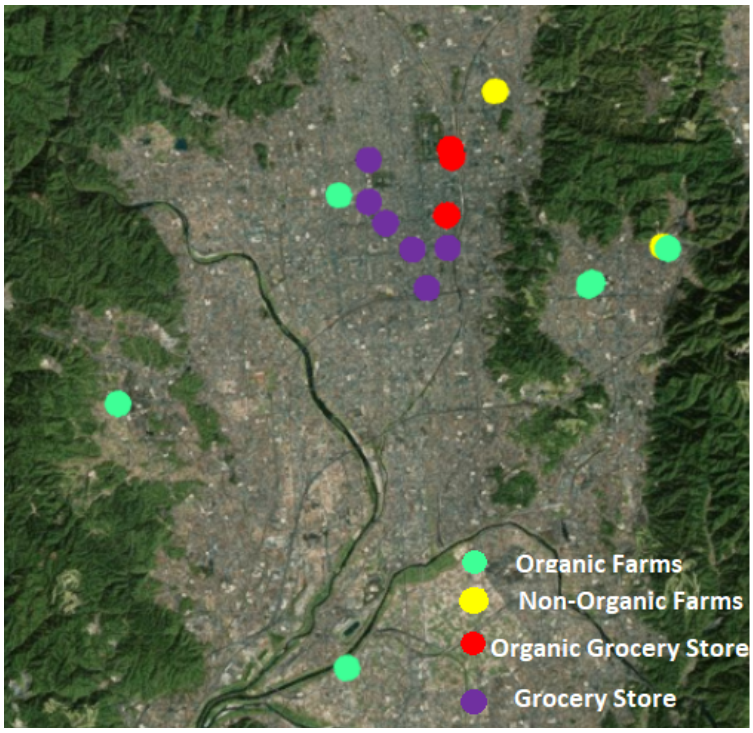

Figure 10: *Map of farms and stores visited during our time in Kyoto*

3.2.4 Interviews

Interviews are a great way to get detailed information from people while directing their minds to other possibilities or considerations. Interviews provide information that is not found in an article, and it offers people an opportunity to share more than what the question at hand is asking.

As previously mentioned, the team spent a lot of time going to farms and making observations and conclusions on how different farms were run. We also observed who was taking care of these farms and tried to keep track of whether they were run by a younger or older person. We did this to confirm our findings that there has been a decline in Japan due to aging of current farmers. We gathered a lot of information through observations, but also conducted informal interviews with the farmers. These interviews helped us understand the different scales in which these farms come and how the farming profession is seen by different farmers. The interviews helped us distinguish the difference between organic and conventional farming. Originally, we had planned to conduct formal interviews, but the language barrier was difficult to navigate, and we found that the casual and relaxed nature of informal interviews allowed us to learn more about the farmers. These interviews were conducted by the means of question and answer. Many of the farmers only spoke Japanese and we used translation services such as google translate and DeepL to facilitate conversations. A list of questions can be found in Appendix C.

After constructing a classroom for Chuck Kayser, we were able to host and sit through a practice class with other students. During this time, we were able to act as students in Chuck's class and look at what this paper is about from a student's perspective. We were also able to communicate with and interview the other participants in the class and ask them questions regarding their interests in organic farming.

3.3 Objective 2: Build a classroom that will serve as a space for learning and practicing organic farming in Kyoto.

Our team worked with Chuck Kayser to create a multipurpose space where he could hold classes and teach people about farming and sustainability. We spent some time designing a classroom and finding the best materials we could use within our budget and expertise. We also investigated information on taxes and building constraints for creating a temporary and tax-free building. This was done to determine whether our current design could be legally built in the zone that we were constructing in. The classroom needed to meet certain conditions before it could move from the design phase to the construction phase. The most important requirement is that the classroom needs to be temporary. When creating a design that meets those requirements our team also considered the indoor conditions of the classroom. These classroom conditions include classroom temperature, humidity, and insects - a common issue in summertime Kyoto. Our sponsor also had specific requirements that needed to be met for the inside of his classroom such as desks for his students to get hands-on working experience. The most imminent constraints of the project are the land size, finances, and tax laws. To make sure government regulations did not interfere with our building we went to the Bureau of Legal Affairs and checked the building laws in our construction area. We used steel beams and metal connectors to construct the classroom and reused materials Kayser had to design and furnish the interior. We spent two weeks constructing the classroom so classes could be held on 11/26/2022 and 12/3/2022.

Our team began thinking about the building construction shortly after coming to Japan and we were able to get an interview with an architect by the name of Benoit Jacquet. We were able to present our building plan to him and through his help, we were able to simplify our design and construct something that was more feasible for the short time we were in Kyoto.

Figure 11: *Image showing the construction progression of the classroom*

Chapter 4: Findings

This chapter's contents involve our data collection during our time in Japan as well as an analysis and comprehension of that data. As previously mentioned, our team was in Japan from late October to early December, so all the data collected in this section is contingent on that time frame. The work done during this chapter is connected to and reinforced by the preliminary research done in chapter two.

4.1 Farm Visits

The goal of this project is heavily dependent on understanding farms, and farm life around Kyoto prefecture and Kyoto city. Once our team arrived in Japan, we dedicated a lot of time to visiting as many farms as possible and understanding their importance to the food system in the city. During our farm visits, we made observations about the elements detailed below. We also interviewed people that were working on the farms to better understand the farm that we were visiting and learn about factors that may not become apparent through observation alone.

Farm observations:

1.) How large is the farm?
2.) What is grown in the farm?
3.) How much of every produce is grown on the farm?
4.) How many people are working on the farm?
5.) Water irrigation
6.) Composting
7.) Land Recovery
8.) Greenhouses

Other points of interest:

1.) Is the produce organically grown?
2.) Where is the product sold?
3.) Why does the farm exist?

In addition to our observations, we also asked the above questions. More detailed interview questions can be found on appendix C. We navigated the language barrier through the help of google translate and other apps to understand and capture the stories that these farmers had to tell. The information we learned from the farmers are explained later in the section. The answers to the questions that we asked the farmers were condensed into a paragraph along with our observations for clarity. Pictures are also included to provide a better sense of the information that is being shared.

As we visited different farms, we categorized them by size and purpose to better understand the different levels of farms around the city. Although not every farm fits perfectly

under one of these categories, they do fit the criteria for that given placement. We decided to categorize them as shown below.

- Subsistence Farms - Personal owned farms and community farms that don't reach consumer level
- Traditional Farms - Farms that are owned by a person or persons that does reach the consumer level
- Corporate Farms - Big farms owned by powerful companies with large distribution

4.1.1 Subsistence Farms

This section will investigate some of the smaller size farms that the team observed around Kyoto city. We noticed a lot of small farms in Japan that were not all recorded due to them being personal farms on private property. As we traveled around the city, we also took note of everything that was grown that was not necessarily a farm or a garden. An example of this would be small plants grown outside of people's homes in small spaces they had available. We noticed persimmon trees, lemon trees, parsley, peppers, and many small easy to manage plants. We also noticed various fruit trees growing around the city such as the Takase river. Figs, persimmon trees, and lemon trees were some of the fruits we observed growing around the city.

Figure 4.1 below shows some of the subsistence unnamed farms we visited around the city. These farms are placed in the subsistence farm category due to them usually being owned by a singular person or family. During our conversations with the farmers, we found that these farms usually fit the description of organic from chapter two although they were not all organic certified by JAS. These farms grew vegetables of the season without the use of many chemicals and pesticides. This makes the farms sustainable as the growth of the produce is solely reliant on natural resources that come from the earth. The farm owners sometimes sold their produce on a small stand outside their house, but the produce was usually limited. The produce quantity was small and there were usually only a few different produces grown such as green onions, leafy greens, and various fruits.

Figure 12: *Image of small farms located in Kyoto city.*

The Share Field Kinkakuji farm shown in Figure 4.2 below is a community farm that is different from the ones described above. The farm was small in size, but it belonged to a community as opposed to one person. The farm as we noticed grew similar things to the above farm and kept in season items. There were no greenhouses noticed and the quantities of grown produce were small. The farm used some pesticides for growth, so it would not be considered organic. The produce was shared amongst the community that pays for its maintenance and the excess produce was sold in baskets to people who are interested.

Figure 13: *Image of ShareField Kinkakuji Farm*

4.1.2 Traditional Farms

Ohara is a farming town located just outside of Kyoto city but still within Kyoto prefecture. Much of Kyoto's produce comes from Ohara. In Ohara we visited a group of farms and farming communities that were all near each other and shared the same land area. The entire farm was called Tiki farm and there were many residents working on the land. Many of the farmers lived close by with some of the houses even being in the center of the farmland. From our conversations with some of the farmers in the area, we concluded that most of the produce in the area was organically grown and the farmers there spent their days working in the farms. The produce there was also considered JAS certified. While in Ohara we also noticed composting being done in small hurdles. They sold their produce in a big local farmers market and each farmer's story was shared with the crops they grew.

Momota-Nouen Farm, Tiki Farm Kyoto Māori Organics, and Enjoy Farm Try are all farms that we visited and categorized as traditional farms. All three of these farms grow their produce organically and minimize their use of pesticides. They focus on growing seasonal produce and use as little pesticides as possible when doing so. All these farms sell their produce to local organic markets and restaurants and usually offer activities for their farms. The farm's activities include tours, strawberry picking, and meals. These types of farms usually had a few greenhouses which they used to keep seeds and grow vegetables that would be out of season otherwise.

The last big traditional farm to consider is the Midori farm owned by our sponsor Chuck. Midori farm is a sustainable and organic farm that grows and delivers fresh produce to citizens around the city of Kyoto. Chuck runs the farm on his own and grows many different greens, fruits, and vegetables. Midori farm is not JAS certified, but it is organic. Our sponsor Kayser mentioned this in one of our talks with him. He said that many smaller farms, while organic, do not try to get the JAS certification as it can be very expensive, and it does not make much sense financially for a farm of this size. Midori farms fits our project goal perfectly as Kayser mentioned that he does not use chemicals to grow the produce in his farm, but instead uses organic fertilizers made from composting which he makes himself, and many other farming practices such as crop rotation.

Figure 14: *Images of Tiki Farm*

Figure 15: *Images of Farmers Market located near Tiki Farm*

Figure *16*: *Images of Momota-Nouen Farm*

4.1.3 Corporate Farms

The last type of farm we noticed around Kyoto is the larger company-owned farms. Rocks farm is an example of this type of farm. During our visit to Rock farm, we noticed that the farm owned a large chunk of land which was later confirmed by one of the employees we got to interview. She explained to us that Rock farm was a big company farm that grew produce in large quantities and sold it to big corporate supermarkets such as fresco or through their website. They grew vegetables such as corn, sweet potato, green onions, edamame and more. They also had many larger greenhouses and grew some produce that was out of season. During the interview they revealed that the farm was not organic, and they were able to keep up with the demand through the help of pesticides and other chemical fertilizers.

Figure 17: *Image of Rock Farm*

Another example of this type of farm is the Kyoto University Experimental Farm. This was another large farm built in the campus of Kyoto University for the purpose of learning and developing new fertilizers that stimulate growth and such. The farm mostly grew rice and soy. The farm did not fit the idea of organic and relied heavily on science when it came to the growth of the produce in the farm. The farm had a lot of big greenhouses where students were noticed growing plants despite the farm being dead outdoors as it was the off-season. Although the farm was not organic, there were traces of sustainability that were noticed there such as some composting and land recovery. Land recovery can be described as farmland that was left alone for the time being so that the nutrients in the soil can recover for the next planting season.

Figure 18: *Image of Kyoto University Farm*

4.1.4 Farm Analysis

As the team went out to visit farms, we tried to pick up a trend to see how these farms could help us find a conclusion for our project. In the smaller farms we noticed that people grew fruits and vegetables usually as a hobby and organically. The traditional farms as described above also followed this trend, as they were run by hard-working people who maintained fairly large farms for the amount of labor available and the produce, they grew was organic. This allowed them to grow enough for themselves and be able to sell it to consumers for a profit. As mentioned by our sponsor Chuck during one of our interviews, “organic farms can only grow so big before hitting a point where they are no longer sustainable” which is where the corporate farms are formed. These farms were run by people that are trying to make a profit, so they have to mass-produce and sacrifice the luxury of organic in order to keep up with the demand.

Chuck aims to educate people on farming and promote a more sustainable way of living, and not create giant corporate farms. The observation and interview data gathered from the first two types of farms has proven to be very useful toward our goal. The traditional farms show that with hard work and commitment, organic growth is possible and enough for a sustainable life, while the smaller farms and gardens show that it is common for people to grow some vegetables and greens in their home gardens.

4.2 Market Visits

Through visiting various grocery stores and produce sellers, we discovered there are many ways that products are sold in Kyoto city and prefecture. There are grocery stores, outdoor markets, roadside popups, specialty shops, and direct-from-farmer delivery. Grocery stores are the most common source of produce for Kyoto Residents. In this section, we will be describing each of these sources and analyzing each of these sources to see how they contribute to the organic landscape.

4.2.1 Grocery Stores

Grocery stores vary on whether they carry organic goods. In grocery stores, our only method to tell whether something was grown organically is through the JAS certification. Due to

the language barrier sometimes, we could not ask the farmers directly about their farming methodologies and values due. The most common grocery chain in Kyoto is Fresco which generally carries the most common types of produce without many varieties. The fruits and vegetables in most Frescos are in good-looking presentable condition. The produce is often wrapped in plastic and contains little to no damage/imperfections such as holes in leaves or weirdly shaped fruit. None of the Frescos we have visited sell any JAS-certified organic produce. This does not mean Fresco does not sell organic produce in Kyoto, as some products could be organic but not organically certified.

There isn't concrete data that outwardly describes the number of groceries stores in Kyoto, however, search engines such as google maps or apple maps provide a reasonable estimate of the amount of grocery stores in Kyoto. According to the map in this specific region, there are about 25 grocery stores in this area. Although this map is not representative of all the grocery stores in the area we reside in, it provides good insight of what is around.

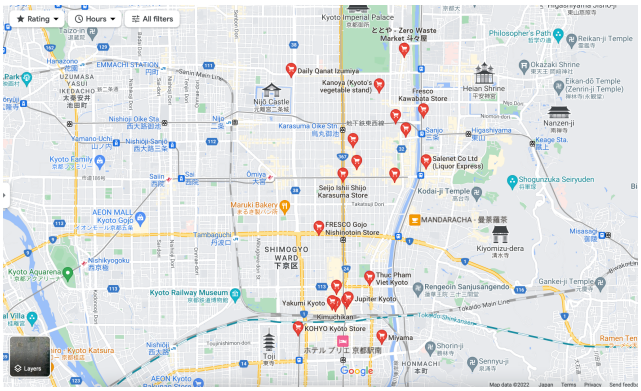

Figure 19: *Image of Google Map when "Grocery Store in Kyoto" is searched*

When looking into organic stores specifically, we can see that there are approximately 20 organic stores in the same region as shown in the map in figure 4.10. There are also some stores that repeat and go into the category of "grocery stores" and "organic stores."

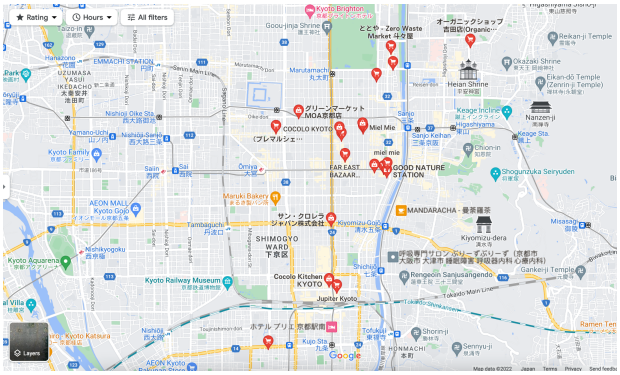

Figure 20: *Image of Google Maps when "Organic Store in Kyoto" is searched*

4.2.2 Outdoor Markets

Outdoor markets are designated areas where craftsmen and farmers come to sell their produce and products in small tent-like stalls. Outdoor markets can occasionally only be farmers' markets, similar to what is in the west, where only food and produce are sold, but often times they are mixed into a larger market where there are also handicrafts, ceramics, and various other goods for sale. These markets are filled with many stalls that will contain organic produce brought there by the farmers that morning. Others will be selling produce out of boxes. Some produce will be wrapped up prettily in plastic while most others are not. Produce at these markets have imperfections as they are expected to since it's produced by local farmers. One can only know if the produce is organic by speaking directly to the seller or farmer who is often very passionate to talk about their food. Outdoor markets are one of the best ways to connect with farmers and learn more about the food you eat. It's important to note that not all organic produce comes in the form of raw produce. Commonly seen at these stalls are pickled or dried fruits and vegetables. We are unsure if these products are organic or not but they tend to be seasonal.

4.2.3 Roadside Stalls

Roadside stalls are little popup shops where produce is just laid across a table, wooden shelf, or repurposed crates with a sign that lists the price. These stalls are typically in front of someone's house or shop and are products grown in their backyard farm or garden. The prices of these goods are very low, and the quality varies. The seller can be present with the produce, or the shops can be completely unattended and rely on the honor system to pay before taking the produce. We could not verify if the unattended produce was organic. However, from speaking to the sellers who stood next to their shop the goods were almost always organic because they practiced traditional agriculture techniques.

4.2.4 Independent Farmer

An independent farmer is a method in which the farmer directly sells to the customer. The farmer picks the produce from their farm, washes it, and then drives the produce to the customer on the same day. These produce packages contain a variety of produce that is in season. These services, from our observations, are organic as its often done by small farmers with close ties to their community. Naturally, these fruits and vegetables are not in perfect condition and can come in a variety of appearances. Our sponsor Chuck Kayser uses this method to distribute his organic produce.

4.2.5 Specialty Stores

Specialty stores are stores that focus on selling one category of product such as a store that only sells imported goods. Here, we will be focusing on stores specializing in selling organic, local, or sustainable goods.

Most of the specialty stores that we visited were in areas that were easily accessible and had adequate transportation to those stores. The specialty stores that we visited were Farmers

Grocery store, Zero Waste Organic Supermarket, and an organic market located in Tavelt Market under Fujii Daimaru in Shijo Kawaramachi. What made these stores unique to a typical grocery store is that they not only contained many or all organic produce, but also carried organic products. These products included toilet paper, detergent, cleaning supplies, and other household items. Additionally, these stores had food, baked goods, and other food related items that were all organic. These stores also carried products catered to dietary restrictions often having small sections dedicated to vegans and vegetarians. Prices from these specialty stores varied between stores. It was common for prices to be slightly higher than a standard grocery store but was not significantly different. This is something dissimilar to the US, where specialty stores carrying organic and specialty products are often much more expensive than a standard grocery store. For the Zero Waste Organic Supermarket, the prices of the produce and products were cheaper than the standard grocery stores we visited. We believe this is because this store strives to use as little plastic as possible and create almost no waste. Items were sold in jars and customers choose how much of each product they wanted. Farmers delivered their produce to this market as in, therefore eliminating the need for plastic wrapping and packing, decreasing the sales cost. Figure 4.13 below shows how the market was set up for customers to shop.

Figure 21: *Image of Farmers Grocery Store*

Figure 22: *Image of Zero Waste Organic Supermarket*

4.2.6 Market Analysis

The growing prominence of specialty shops selling organic produce, as noted by some shop owners, signals a revitalization of interest in organic food for Kyoto Residents. Although the standard supermarket chains have yet to adopt organics into their selection, and if they do, it's highly limited, the trend will grow as more people are being exposed to certified or non-certified organic produce. Organics are typically more expensive and less "perfect" in appearance than their mass-farmed counterparts due to the effort it takes to grow. The various methods that distribute this produce are distributed illustrates that this sector has room to grow and can come from many sources from large farms, small single-owned farms like Chuck's, backyard gardens, or even a family fruit tree.

We expect interest and desire for organic produce to grow even more especially with our efforts in building the classroom, which informs more residents about the benefits of organics and the detriments of chemical farming. Our contribution will further add to the momentum of the sustainable food movement in Kyoto.

4.2.7 The Importance of Seasonality

We discovered that a large and distinct part of Japanese food culture is the importance of seasonality. When produce is “in-season” it means it is at its peak and grown in the timeframe that it evolved to flourish in. Oranges grown in the Winter would not be seasonal, however, chestnuts harvested in the fall would be. The difference is that orange trees do not naturally produce fruit in the winter, while chestnuts naturally fall off their tree in the fall indicating ripeness.

Japanese people value seasonality greatly which is why only certain dishes or food are available at one time and not others. For example, our team arrived during autumn which is persimmon, chestnut, and yuzu season. These flavors are endlessly presented during our stay here with some shops only opening this time of year and closing after. We did not see any sakura (spring) or peach (summer) dedicated pastries during autumn.

In Japan, there are some specialized to Kyoto directly because it’s the cultural center of Japan where seasonality is felt even more prominently. Obanzai, a Kyoto originated dish is a meal with multiple courses that requires at least half of all the ingredients used to be seasonal. Obanzai can be in a fancy Kaiseki meal or simple home dishes cooked for the family, regardless of it must use in-season ingredients. In fact, some restaurants refuse to serve dishes outside of their season to not disrespect the customer experience. If one asks for Yodofu (winter hot tofu dish) in summer the restaurant would not even carry the ingredients to make it. The reason extends beyond the season of the ingredients. Yodofu is meant to be eaten in contingency with the cold winter weather to warm the body which is unnecessary in summer.

4.3 Building Regulations

The classroom we are constructing must abide by all Japanese building laws and regulations. According to Japanese Kenchikushi laws, buildings that are smaller than 100-meter

square do not require an architect (Tomohiro, 2013). We used metal scaffolding poles and connectors to construct the building. The size of 20m² combined with the main material we are using puts the building into the small building category which bypasses stress calculations and performance evaluations. According to the Code for fire safety, buildings in use for educational purposes must be a fire-resistive building if the third floor or higher is used for education purposes. Considering that our construction is only one floor, we are in line with the regulations. The classroom will be built in the 9-8 zone shown in figure 4.14 which is a residential area allowing for small size temporary structures like ours.

Figure 23: *Image of building zone book from the Bureau of Legal Affairs District office*

Use \ Grade of building required		*Fire-resistive building* (in case of (1) or (2))		*Fire-resistive building or Quasi fire-resistive building*
		(1)	(2)	
3	- Schools - Gymnasia - Museums, Art museums - Libraries - Bowling alleys, Indoor ski slopes, Skating rinks, Swimming pools, Sports practice facilities	The third floor or higher is used for any of these uses.	-	The total floor areas for the use is 2,000 m² or more.
4	- Department stores, Markets - Exhibition halls - Cabarets, Cafes, Night clubs, Bars, Dance halls, Amusement halls - Public bathhouses - *Machiai*, Restaurants, Dining facilities, - Stores engaged in commodity sales (excluding those with a floor area of 10 m² or less)	The third floor or higher is used for any of these uses.	The total floor areas for the use is 3,000 m² or more.	The floor area for the use on the 2nd floor is 500 m² or more.

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Figure *24*: *Image of table for determining Fire Safety Code*

Total floor area (S: m2) \ Height and structure		height of building ≦ 13 m and Height of eave ≦ 9 m					Height of building > 13 m, or Height of eave > 9 m
		wooden			Non-wooden		
		1 story	2 story	3 story	Up to 2 stories	3 stories or more	
S ≦ 30		Anyone can engage in this.			Anyone		
30 < S ≦ 100							
100 < S ≦ 300		1st, 2nd, or *Mokuzo* may engage in this.					
300 < S ≦ 500		Only 1st–class or 2nd-class may engage in this.					
500 < S ≦ 1,000	General-purpose buildings						
	Special-purpose buildings						
1,000 < S	General-purpose buildings	1st, 2nd	Only 1st-class may engage in this.				
	Special-purpose buildings						

Figure *25*: *Image of table showing scope of different architect*

Chapter 5: Conclusion and Recommendations

5.1 Conclusion

Over the course of the past 14 weeks, we have sought out to help Midori Farm carry out its mission to revitalize neglected farmland and rural areas to restore the traditional Japanese food system and environmental health of Japan. Through community-based intervention, educational programs, and farm events, Midori Farm has strived to make a positive impact on Japan by expanding the organic scene in Kyoto and helping bring awareness to the lack of farmers in Japan. After many successful pursuits to this goal, the next step for our sponsor Chuck Kayser was to bring farm life to the city. This is where our goal to promote a sustainable food lifestyle to Kyoto residents through organic urban farming came in. The classroom our group built created an accessible pathway for Kyoto residents to take part in organic urban farming and learn about the organic agricultural landscape of Kyoto.

As we reached the end of our 14-week journey, our project concluded, but our impact was just beginning. What started as a simple construction of a classroom flourished into a greater purpose of understanding the farming and food culture in Kyoto. Our research from chapter two shows a decline in the number of farmers and farmland in Japan over the past century. With the decrease in the number of farmers, large companies and corporations took control of food production in Japan. These companies maintained large farms, but through harmful non-organic means. The use of toxic chemicals in farming has increased through the years. Although this process helps provide large quantities of food in the short term, it comes at the cost of destroying the land, people, and living systems around it. Farming through toxic chemicals is not sustainable and will continue to negatively impact the living systems around it if the necessary steps towards organic farming are not taken.

During our time in Kyoto, the team was able to see the city of Kyoto through our own eyes as described in chapters three and four. We were able to witness firsthand how larger corporate companies are taking over the farming scene. They have the resources to grow a substantial amount and variety of produce at a low cost during any season. However, we also saw many traditional farms that are still being run organically throughout the city. We had meaningful and impactful conversions about organic agriculture and the farming lifestyle in Kyoto. It was noticed that although this lifestyle was a lot of hard work, it was extremely rewarding. During some of our trips to farms, workers would stop their work to talk to us. In some cases, we could not understand one another due to the language barrier, but were able to see the love, passion and joy farming gave to that individual. Farmers and small gardeners alike took pride in their ability to maintain a sustainable food cycle. The ability to plant a seed and provide it with the necessary nutrients to grow and harvest to eventually eat is an exceptionally valuable thing. This process positively contributes to the individual's health and environmental health and contributes to the traditional foodscape of Japan. Through our efforts, it was also noticed that this way of living also fosters a community of giving and sharing.

Our sponsor Chuck Kayser and all the farmers we met that owned traditional and/or organic farms confirm that there is still hoped to direct people towards a life of organic farming. Whether people decide to become full time farmers, start a small garden in their yard, or choose to shop organically, any step towards organic agriculture makes a positive impact. The more Kyoto residents adapt to an organic lifestyle, the Japanese government will eventually be compelled to meet the demand of organic produce and products, increasing the organic opportunities for many. Captured in this paper is the passion and gratifying feeling shown by these farmers combined with the importance of organic and sustainable ways of farming. Our hope is to inspire the younger generation to take part in organic agriculture in any way they see fit to help promote Midori Farm's mission.

5.2 Future Recommendations and Considerations

The Japanese organic agricultural foodscape and landscape is a complex topic with lots of moving parts. The extensive research and field work we performed, only encompasses a fraction of what can be discussed. The work that has been completed reflects a 14 week timeline. If we had more time to dedicate to this project, the following actions would be taken.

5.2.1 Visit More Farms and Markets

If we had more time to work on this project, we would visit more farms and markets to get a more comprehensive outlook on the organic agricultural and food landscapes in Kyoto. The more information we gather on this topic, the better we can support the organic and sustainable food systems movement. Visiting more farms gives us the potential to gather concrete comprehensive data on how many farms and markets are located in Kyoto. We would record the different amounts and types of farms and markets and analyze the data that's been collected.

5.2.2 Permanent Class Recommendations

If the temporary classroom proves to be successful after a few more practice trials, it makes sense to then move towards a more permanent class. A permanent structure would be more structurally stable and more aesthetically pleasing than our current temporary design. This will lead to a safer environment for the students and provide a more welcoming atmosphere. Appendix A outlines the specific details of what the permanent classroom can include. Although this appendix describes temporary techniques, with careful planning these ideas can be applied to a more permanent solution.

5.2.3 Developing a Curriculum

Our team has gained a good understanding of the farming and food culture in Japan, as well as the issues that have formed with the arrival of industrialization and aging of farmers. Using this information, combined with the help and knowledge of farmers like Chuck Kayser, we believe that it is possible to create a more comprehensive curriculum that can be implemented in other educational settings. Once our sponsor, Chuck Kayser has established a more permanent

situation for the classroom, he plans on integrating a curriculum that includes lectures and interactive components. In collaboration with Chuck, our group would work on establishing a curriculum that could be replicated by others who want to teach people about agriculture and organics. Ideally the curriculum would be applied in schools and universities to help spread awareness of the issues described in this report.

5.2.4 Social Media

Farming was described to be an old profession, but it does not have to remain that way. When we talk about attracting and encouraging the younger generation to get involved with organic farming, we should consider delivering the information in a way that is appealing to the younger generation. The lessons from this paper and different farming techniques can all be advertised online in platforms such as YouTube, TikTok, Instagram, and other popular social media platforms. These social media platforms also tie into the previous recommendations as they can be a great way to advertise the classes as well. In the case of Chuck Kayser's class, he could talk about an interesting farming fact or planting tip in a short 60 second video that would spark interest in people to attend a class.

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Appendix A: Design Process

Modular-Temporary Structures and Design Process

Modularity and sustainability design approaches can be essential concepts for an innovative solution to building construction that suits the needs of the surrounding population. Temporary structures first made their appearance in the era of the nomads. These temporary structures were made temporary to easily facilitate moving to different locations and accommodate for the lack of building materials and building knowledge (Kolimárová, 2022). In the past, Japanese architects began to promote pre-built buildings and the idea that buildings should be restored and repurposed (Chen et al, 2021). Currently, temporary buildings and structures are used for different public events that are one-time only or repeat on a monthly to yearly basis.

Similar Temporary Structures

Sustainable and temporary structures are not a new concept and have been used often in the past, whether for emergency situations or short-lasting events. Lombok, Indonesia was hit by a devastating earthquake in 2018 which destroyed many of the educational institutions there. The restoration process for the old buildings took a long time, so in the meantime temporary classrooms were constructed in order to resume education (Musdinar, 2020). A temporary building is one that can be put up quickly, yet it should also fit the basic requirements for its purpose. The Lombok engineers were concerned with factors such as the time that it would take to put the structure up or the gathering of materials. The materials have to be available in the area nearby, but they also can't be heavy or permanent materials such as concrete. A classroom also needs to meet some specific standards such as weather, safety, lighting, and controlled temperatures. The idea of temporary and portable classrooms was also implemented in some schools in the U.S. in order to support the continuously growing population and lack of funding in school budgets. Overall, the portable classrooms worked great. At first, however, the classrooms raised many concerns such as safety, effects on the student learning, health conditions and aesthetics (Patterson et al., 2009). The classroom's success varies on these conditions which should be a main focus on the design process.

Design Technology

Temporary structures are usually put up with the intent of being kept for a short amount of time. It is not uncommon that temporary buildings can be unsafe and faulty. This is mostly a cause of poor design work and miscalculations as far as previous research. A design failing could result in many safety issues up to an entire collapse of the building (Crosti et al., 2016). It is recommended by engineers that current technology is used in the design of temporary structures (Jin & Gambatese, 2020). Technology such as 3D design programs known as Computer Automated Design (CAD) or various types of sensors can be incorporated into designs to reduce

the chance of error. Technology can be used to take accurate measurements of materials and provide information on soil quality and more.

Modular Design Technique

A modular concept is an exceptional way to design a temporary building. Having modularity in this application is defined as "consisting of separate parts that, when combined, form a complete whole" (Cambridge University Press, 2022). Modular construction must involve specific design intent, where modularity must be implemented in all aspects of the design process in order to achieve a desired final product. Modular design arises from the distinction between a product as a whole and its separate components. The distinct parts become independent entities of the product, standardizing the components, and allowing for the modification of parts to meet different functions (Tezcanli, 2006). Something important to keep in mind when designing for modularity is to identify and recognize what components are dependent on each other and determine a set of rules on how to proceed with designs. Modular designs are cost and time effective, customizable, and provide a lot of room for design creativity, making this a viable option for a concept to pursue while designing the classroom.

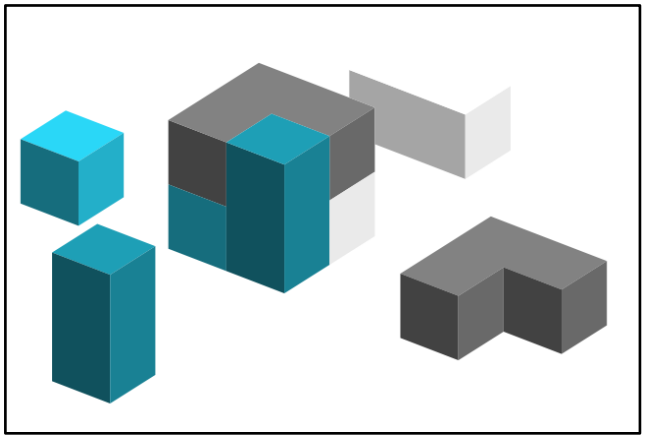


Figure A.1: *Representation of Modular Design with Blocks*

The Concept of Lego Architecture

A sustainable and modular design concept that can be incorporated into our design plan is lego architecture. Alongside sustainability, an important aspect of all design techniques will be to ensure that all design plans and ideas implemented are designed with the intent for easy assembly, disassembly, and modularity. The concept of lego architecture is something that meets all these requirements as well as the needs of the proposed classroom. Lego architecture "refers to a kind of design inspired by the logic of Lego bricks, which usually has a significant modular feature in the shape of components" (Chen, 2022). Lego bricks were designed with the intent of versatility and mobility. Additions can be made, and certain components can be removed or relocated in order to account for changes to design plans, ideas, or even changes to the purpose of the structure. Lego architecture increases designers' capabilities of problem solving, enabling

them to have more unique ideas and solutions to design challenges. The ability to have multiple solutions to one problem gives a better chance of selecting the best and most viable option for a design problem. The idea of lego building demonstrates a type of sectional modularity. Sectional modularity allows for the greatest amount of variety and customization when compared to other types of modularity. Various types of configurations can be made between the components involved in the design plan. Structures designed and built following this kind of design concept can be changed by the builder and even the consumer allowing for changes in size, shape, and color. This kind of customization is also a sustainable option for long-term spaces. Structures and spaces that have outgrown their purpose can be easily reused and changed to better accommodate their new function. Furthermore, certain components of the original structure can be reused for other structures, speeding up the development process of new structures (Tezcanli, 2006). The reuse of space and materials makes the concept of lego architecture a very sustainable option for building design, especially in terms of longevity.

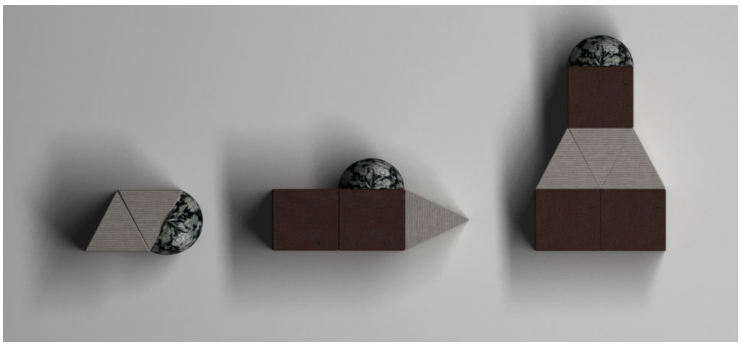


Figure A.2: *Demonstrational Image of Sectional Modularity*

The Concept of the "Square Box"

Another design concept to be explored is the idea of a "square box". To adopt the development of the square box, the principles of modularity, reversibility, sustainability, and more were applied. The square box was created in order to address the issues expressed by the scientific community. After extensive research performed on sustainability and temporary structures the design of the square box came into fruition. The square box "is a modular box-like element able to contain other component elements" (Rotilio et al, 2022). The square box consists of moveable and removable walls equipped with expandable spaces and compartments. Panels built into the wall can cover and protect any items being stored or displayed on the wall. There are two main phases of the design, one where the wall is in a fixed position and another where doors and compartments coming from the wall are moved and rotated to create more space, storage, and uses for the "box". There is a ladder attached to a wall that is able to assume two positions, one where the box is closed and the other when the box is open. To remain sustainable, the materials used for this design mostly consist of wood and wood derivatives. Wood-based building materials have low fossil fuel consumption, low greenhouse effects, low solid waste generation, and low energy consumption compared to other materials (Rotilio et al, 2022).

Designing following the concepts of the “square box” offers a valuable solution to a modular, temporary, and sustainable classroom. The square box design meets all the needs of the classroom while stressing the aspect of sustainability and modularity.

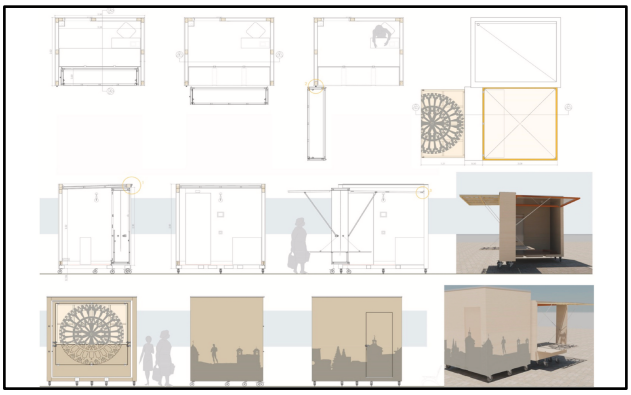


Figure A.3: *Images of Square Box Configuration.*

The Importance of Sustainability Design

A key factor to this project is to remain sustainable and an effective way to do this is to design with sustainable intent. Sustainable development is defined by the United Nations (UN) as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN Documents Gathering a Body of Global Agreements,1986). The different kinds of approaches to modular and sustainable design will be discussed alongside the requirements that classify a structure as modular and sustainable.

Design and developmental plans should include standards that go above and beyond the minimum requirement for sustainability. Needs determined by social, cultural, and economic factors are a few driving forces that determine the societal value and purpose of a new structure. The classroom being built will help facilitate the connection between city living and skills learned through farming and sustainability. This classroom can help cultivate the ever-growing movement towards organics and sustainability which has great value. Fostering the relationship between people and farms creates a pipeline to better understand nature and learn how to use the nature around you to incorporate green living and sustainability into an everyday lifestyle. Sustainable development should guide sustainable design and implementation so that all resources used, and aspects of development cooperate while enhancing “both current and future potential to meet human needs and aspirations” (UN Documents Gathering a Body of Global Agreements,1986).

Internal Conditions

A common issue that can be miscalculated when designing a temporary structure is the presence of thermal heat. Buildings with poor construction often reach inside temperatures that can be equal to or greater than those on the outside. This is why proper ventilation is very important when designing a structure. When constructing the building it is important to leave open areas such as windows or openings in the corners so that heat can easily flow out and not be

trapped inside the building (Bauer et al., 2010). Furthermore, there is also insulation material such as mineral wool or fiberglass which makes it harder for heat to move in and out in colder conditions. Lastly, there is the aid of mechanical ventilation or air conditioners which can be used to adjust room temperatures.

Classrooms usually require silence or minimal sound interference from the outside world in order to function well. When designing a building it is important to account for this issue that can occur. One solution to this problem is double-skin facades which are layers of wood that are tilted to an angle and placed on the outside of a structure (Bauer et al., 2010). This is very similar to the plastic siding that is seen in many traditional American houses. The tilt of this material interrupts the sound frequencies and prevents noise from going inside.

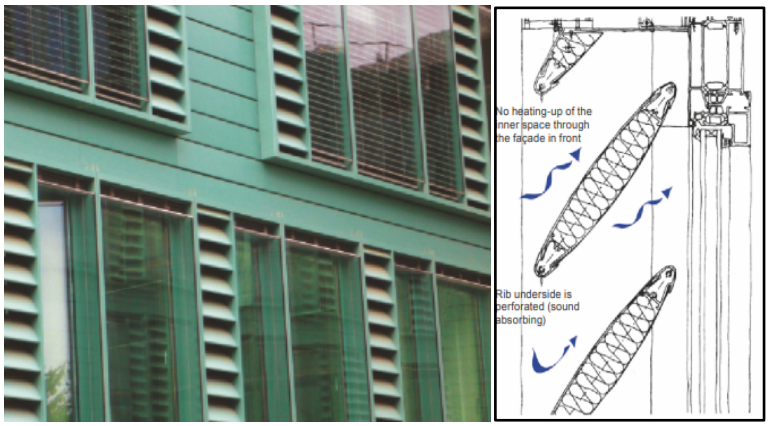


Figure A.4: *Double-skin facades*

Foundation

The foundation of any structure consists of the bottom part of the building that is responsible for holding up the floor and the walls. Typically, most building foundations require digging and heavy based materials such as concrete to be poured into the ground. The structure that this project is looking into however needs to be temporary allowing for quick assembly and disassembly. Although materials such as concrete and steel make good foundations, they are very difficult to remove. An alternative to this is through the use of wooden piles which are thick wooden spikes that are hammered into the ground (Seike et al., 2018). The benefit of these spikes is that they can be removed easily while still being able to support the weight. The spikes are also usually removed undamaged and can be reused, making a viable sustainable alternative to atypical concrete foundation. Another alternative that could be used to hold up the walls is cinder blocks. Cinder blocks are heavy and made of concrete with a hole in the middle where a post can go in. (*Cinder blocks (15 things you always wanted to know)* 2021). Cinder blocks are also cheap and common. A combination of the above ideas makes sense for our project as they fit the idea of temporary and are within the project budget.

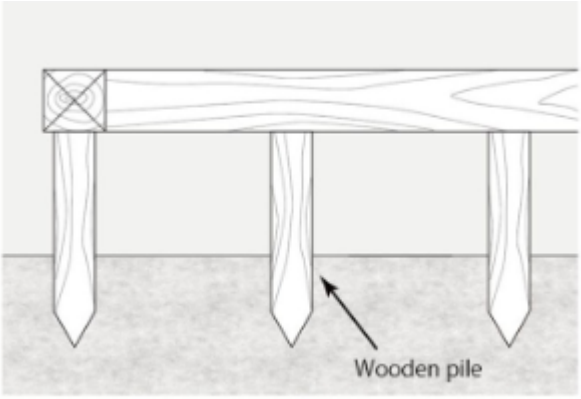


Figure A.5: *Wooden Pile Foundation*

Roofing

A roof is an essential element in making a clear distinction between an outdoor space and an indoor space. There are a lot of things to consider when constructing a roof such as safety, ability to withstand weather, temperature regulations and all other construction aspects that have been previously mentioned. The roof is also what begins to add many of the expenses and taxes to a structure which is later explained in the finance section. Therefore, the roof must be easily removable. Plastic sheets have been used on temporary structures for a long time and have been mathematically proven to be sturdy and withstand weight for a long period of time (*Composite plastic roof shingles: 2022 cost guide*). Furthermore, there is also the idea of plastic shingles which have a very low cost yet still have all the properties of ceramic shingles. They are also very easily replaced in case that one of them breaks (O'Brien & Dixon, 1998).

Building Materials

Sustainability and Recycled Materials

Sustainable materials are those used to create products, provide services, and establish surroundings like buildings that have a generally positive influence on society and the environment. Since the Edo era, when resources were scarce, sustainability has been an essential part of Japanese society. It was valued to have a "Mottainai" mindset (Christina, 2022).

Chuck Kayser has “a passion for nature and organic food production and grew an interest in sustainability” (Kayser, 2022). Given his passions, the use of reusable materials will be put into consideration. What is given? We have some translucent, plastic, corrugated roofing, sacred wood, as well as screws and tools which will be necessary for the building aspect. These will not be the only materials that will be used in the process. Bamboo and Kitayama sugi have been recommended and looked into thoroughly in the research.

Kitayama Sugi

Kitayama sugi (北山杉) is “a Japanese cedar that grows in the northern area of Kyoto City.” (Yu, 2022) Since the Muromachi era, polished logs have been recognized as important building materials for tea rooms and sukiya, a tea ceremony home. A thriving source of Kitayama sugi was the Kitayama region, which is today the area of Nakagawa, Kita Ward, Kyoto City, and is located about 20 kilometers northwest of the center of Kyoto (Yu, 2022). A Japanese technique that uses existing trees to grow additional trees is called Daisugi (台杉). By using this method, a single tree may be cut sustainably for its wood while producing many perfectly vertical trees that sprout out of it in the shape of an open palm. This way we don’t harm the tree and get what is needed to build the structure (Joe, 2021).

Figure A.6: *Bamboo Forest in Kyoto*

Bamboo

Bamboo, a highly versatile and sustainable material/crop, holds a unique place in Japanese culture where it is utilized in everything from building to food. The advantages of bamboo are numerous. This resource is easy to grow, renewable, and grows fairly quickly. It is a very adaptable material with different applications. Bamboo (as seen above in figure 2.6) is an excellent building material since it is weather resistant and has antibacterial qualities. There are thousands of bamboo species. This remarkable plant thrives in both tropical and temperate climates, is extremely resilient, and does not require pesticides or herbicides to thrive. It is a form of grass that sprouts from the ground; when cut, it soon regrows, with the majority of species reaching maturity in three to five years. When it comes to tensile strength, bamboo is comparable to steel and as sturdy as wood. In contrast to wood, when it breaks, it first fractures, giving people time to escape from underneath. It can resist earthquakes of a Richter magnitude up to 7.6.

Community Building

The goal of transitioning sustainable and organic farming from traditional rural Japan into an urban environment may bring social changes. By using urban agriculture to create a network of individuals and groups, the lower class- those most impacted by food insecurity, can advocate for their interests in face of the dominating power. People are drawn together by sharing a commonality. "Cultivation is generally called ‘gardening’, which expresses the skills and enjoyment in applying simple tools to soil and plants, as well as sharing such skills' ' (Levidow,

2018). Gardening creates this common factor that both requires skill and is a physical activity allowing the sharing of knowledge which begins to foster conversation. Different people contribute different things and learn together across ethnicities. We are creating a multicultural sphere. Our sponsor, Chuck Kayser, is an American who has currently been living in Japan for over 10 years. Using this space, he intends to teach people English alongside sustainable farming. It's likely that once someone meets another through conversations here that they bring that acquaintanceship with them into the future allowing for cross-cultural connections. Most visibly, we are combining a bit of American and Japanese.

Ultimately, the project will not only become a multi-purposed and educational space to learn about farming and sustainability but, as shown in communities like London and El Salvador, hubs of community and unity.

Recycled Materials

There are big differences between recycling and reusing. Recycling is the process of reducing a product into its individual parts and reprocessing them to produce a new product. When you reuse something, you preserve it mostly intact but put it to use for something else. “Recycling is often a three-step process that involves gathering and processing waste, making new goods, and buying and selling them (Kamprad, n.d.).” Participants must include a wide range of groups, including both business and the general public. And throughout this procedure, a lot of energy is consumed. Therefore, recycling still generates waste since it uses one resource to build another material or item (unlike reusing). Reusing is about taking an old item and repurposing it. Nothing is being thrown away, broken down, or manufactured into anything new. Changing how you utilize an item is all that is required.

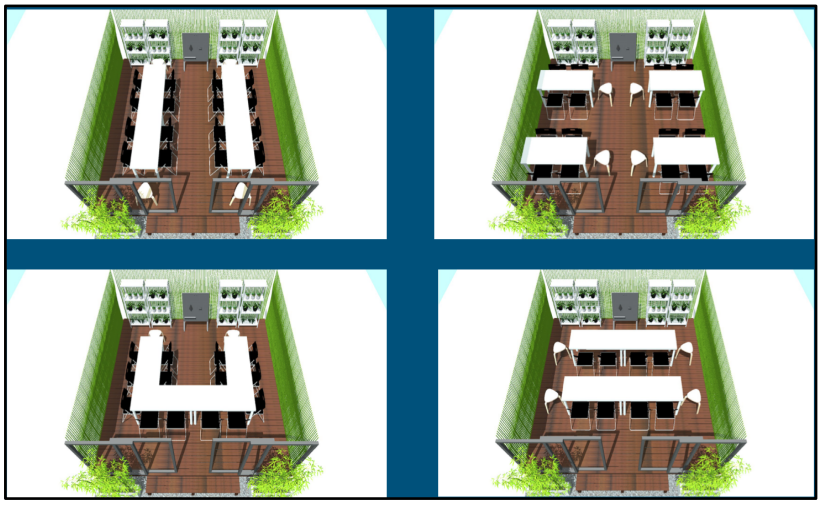


Figure A.7: *Image of potential permanent configurations for the classroom*

Appendix B: Deliverables

Figure B.1: Pamphlet

The pamphlet is an easily distributable source of information on the harmful impacts of chemical farming and the declining number of organic Japanese farmers. It includes both facts and suggestions to live more sustainability such as where to shop and eat. The infographics provides tips and tricks for new farmers to start their home garden.

Appendix C: Interview Strategy

As interviewers, we must be prepared with a direct purpose and list of questions to ask the interviewees. Below are a few steps outlining proper interviewing techniques that we will follow while conducting interviews.

Steps of setting up an interview:

1. Define your goals, what do we want to get out of this interview?
2. Identify a list of ideal candidates, who would be best to fulfill our goals?
3. Prepare a list of questions to ask
4. Contact the candidates
5. Set the tone by getting to know the interviewee
6. Ask the variety of questions prepared
7. Ask if they have any questions for you
8. Conclude the interview and stay in contact

Depending on the level of difficulty we had with communication, some questions were omitted if we were able to answer them through observations. The amount of questions we asked was not limited to our list, as additional questions would arise as we continued to have casual conversations.

Table C.1: Interview List

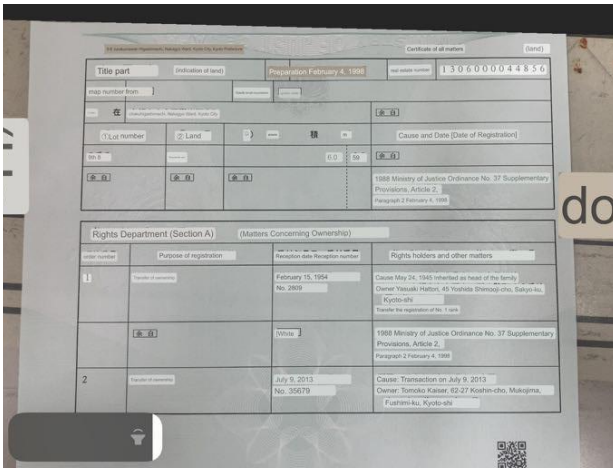
Interviewees	**Goals - what we want to get out of an interview**
Chuck Kayser (Sponsor)	His story as a self-taught organic farmer.
Farmers	Information on the farmer, their farm, and how it runs.
Student in Kayser's class	Did the class improve their knowledge of the organic scene?
Japanese Architect	Japanese tax laws and building codes.

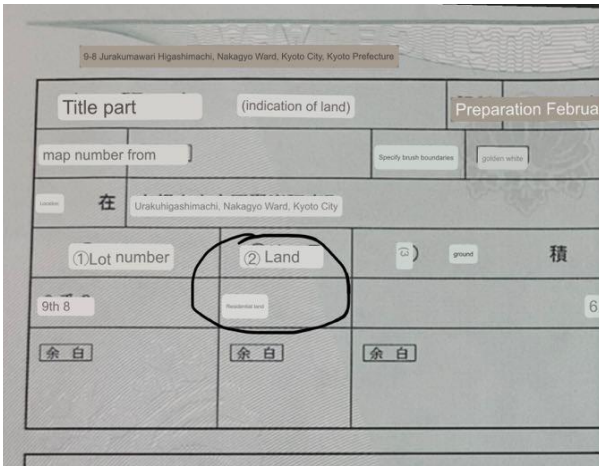
Farmer Interview Questions:

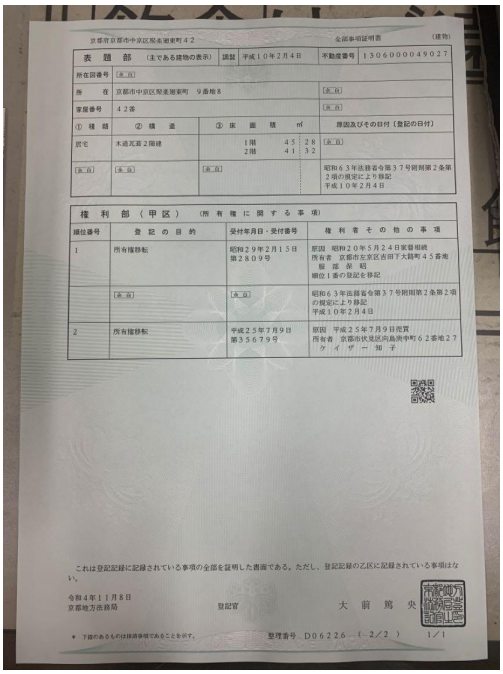
1. How long have you been farming for?
2. Why do you farm?
3. How big is your farm?
4. What produce do you grow?
5. Where do you sell your produce/products?
6. Does anyone work on your farm with you?
7. What are some organic farming practices you currently do on the farm?
8. Is your farm organically certified in Kyoto, Japan?

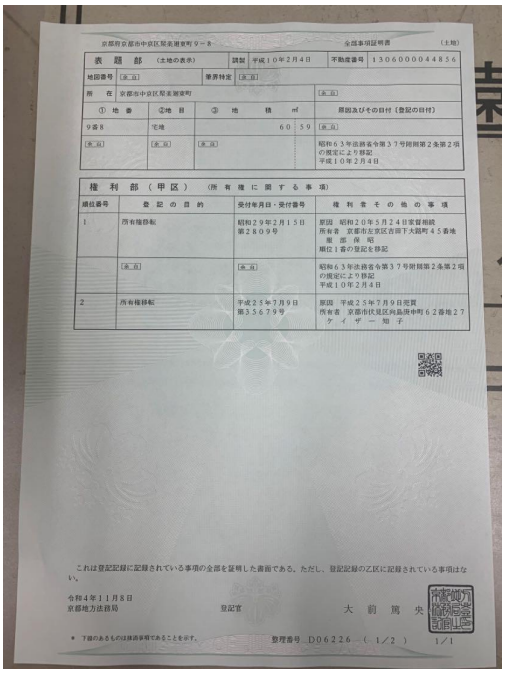
Appendix D: Legal Documents

These legal documents were acquired from the Bureau of Legal Affairs in Kyoto City. They are documents relating to our sponsor's house and the building zone surrounding the area.









Appendix E: Observable Data

Farm

- **Momota-Nouen Farm**
  Farm in Kyoto Yamashina Ward that grows and sells strawberries and tomatoes. Organic farm that does not use unnecessary additives. Performs local deliveries. Strawberries are sold in Momota's store in Kyoto. Strawberries are grown seasonally. People can come to the farm to pick strawberries. Strawberries and tomatoes are grown out of season because they are grown in greenhouses. The strawberries and tomatoes were unfortunately not ripe during the time we visited. This farm is located right next to other farms. These farms grew a variety of produce that included leafy greens, persimmons, rice, and grains.

- **Unnamed Farm located across the street from Momota-Nouen Farm**
  Small organic farm in Yamashina Ward run by two old ladies. They grew a variety of vegetables. These vegetables included leafy greens, persimmon, onions, eggplant, daikon, carrots, and other produce. A 500 yen entry fee is required to enter the farm and get a short tour. Both farmers seemed very dedicated to their craft.

- **Rock Farm**
  Large non organic farm in Kyoto. A corporate farm that grows a variety of produce and sells them to supermarkets. In an area where there are a bunch of small farm companies. Farm also packages and sells produce right outside their farm as well as makes deliveries to grocery stores in the region. Farm delivers to big franchise stores such as Fresco. The farm mainly grows corn, strawberries, sweet potatoes, edamame and green onions.

- **Farm near Kinkakuji Temple**
  A small farm owned by a singular person. Similar to Chuck's farm at a smaller scale. The owner sold his produce online and in baskets, but mostly targeted his neighbors. It is not determined whether it is an organic or non-organic farm. Some plants noticed in the farm are cabbage, lemons, carrots and green onions. Farm is very small and seems to be a side hobby.

- **Tiki Farm Kyoto Māori Organics**
  Large community organic farm in Ohara. Farmers live close by in and around the farm land. A farmers market was located nearby where farmers sell their produce and food. Descriptions and photos of the farmers are shown next to the produce they sell. We had talked to a really nice lady working on a farm who showed her excitement and passion for farming. She told us to look at nature and the mountains around us. A large variety of produce was noticed on this farm including but not limited to lots of daikon, eggplant, leafy greens, carrots, cabbage, yuzu, grain, rice, oranges, lotus, bok choy, hot peppers, and flowers. Homemade mulch and compost was noticed as well as a large irrigation system. A sustainability practice that was noticed was the use of netting to protect against pests.

- **Kyoto University Farm**
  Large experimental farm owned by Kyoto university. The farm is experimented on and used for research and educational purposes. Some produce noticed on the farm was grains, rice, corn, and fruits. The purpose of this is so people can find solutions to issues with food and the environment. The farm uses pesticides, fertilizers and such on their growing as their goal is to teach the best and easiest way of farming.

- **Enjoy Farm Try**
  Medium to small sized organic farm that grew a variety of produce. Had an irrigation system and many sustainability practices were noted. Had many different hand made structures and items to help with farming. Netting for some produce was noted and it was concluded that it was used to keep pests away in replace of using pesticides. Some of the produce that was grown was eggplants, leafy greens, cabbage, hot peppers, persimmon, and daikon.

- **Unnamed Farm located in same neighborhood as Enjoy Farm Try**
  A small organic family farm in a neighborhood near Enjoy Farm Try. Lady was selling fruits and produce right outside her house. She and her husband had been farming for 50 years. Was very kind, willing, and excited to show us her farm on her property. She gave us fruit to sample for free. Seemed very passionate about what she does. Some of the fruits and vegetables being grown were various citrus fruits and leafy greens.

- **Farm located 30 min away**
  Small organic farm owned by one person. Located in what looked like to be the "suburbs"of Kyoto. A variety of produce was grown. Carrots, lemons, eggplants and more were all observed. Not many leafy greens were grown, which is different compared to other farms that we have visited. Farmers sold baskets of vegetables to people. Farmer had a website for his farm.

- **Other Family Farms located in neighborhoods**
  While exploring Kyoto, there were many farms spread throughout Kyoto that could not be found through a google search. These farms were all family owned and were either growing for personal use or growing to sell as a side job to the community, friends, and family. These farms are not certified as organic but often practiced traditional Japanese agriculture which does not use chemicals or genetically modified produce, making the farm "organic" on its own terms. The produce sold from these farms were often cheaper than what could be found at grocery stores or organic farmers markets. All interactions with these farmers were very heartwarming and pleasant as they seemed very excited to share information about their farm and show off their produce.

Grocery Stores & Farmers Markets

- **Grocery store in the Cube in Kyoto Station**
  Somewhat large grocery store in the basement of Kyoto station. Store was very populated with lots of customers. Produce was not Organic but did have very expensive fruit for gifting. Gifting fruits were sold in boxes coming in a variety of assortments. These packages were priced upwards of 10,000 yen. There were also individual melons priced around 20,000. Produce in the grocery store seemed almost perfect. Most produce had no imperfections and vegetables of the same kind looked the same.

- **Santonoeki Farmers Market**
  Small farmers market located in Ohara Japan. Sold locally grown organic produce, foods, and hand made products produced by the farmers nearby. Sold a variety of vegetables including but not limited to leafy greens, tomatoes, potatoes, eggplant, persimmon, green onions, and yams. There was a noticeable difference between the produce in this organic farmers market compared to generic grocery stores. The fruit and vegetables came with imperfections including a variety of different shapes, sizes, and colors. All produce and products had a picture and short description of the farmer/farmers who made and harvested the food. It was a very sweet place with a homey and welcome atmosphere. It was observed that the farmers in that area and the local residents were a tight knit community that obtained most of their produce from these farmers.



- **Fresco Gojo**
  Small grocery store located in Kawaramachi, Kyoto. Does not sell organic produce. Has a variety of fruits and vegetables.
- **Fresco Gojo Nishinotoin**
  Large grocery store located in Kyoto near Kyoto Tower does not sell organic produce but has a variety of fruits and vegetables.
- **Fresco Gojo Ōhashi**
  Medium sized grocery store located in Kyoto near Kyoto Tower Does not sell organic produce but has a variety of fruits and vegetables.
- **Farmers Grocery Store**
  Grocery store that specifically sold organic produce. Carried a variety of organic produce, food, and snacks all JAS certified. Prices were comparable to non-organic produce. Store also carried snacks that were specifically vegan and vegetarian friendly.

- **Tavelt Organic Market**
  Sells all JAS certified Organic produce, meats, processed foods like sauces, and cosmetic items. Farmers sell directly to the store. Tavelt is about ⅛ of the grocery store under Fujii Daimaru and has a separate cash register for its products. Many of the price signs were handwritten suggesting that the items sold are only temporary and in limited supply. Tavelt Market under Fujii Daimaru in Shijo Kawaramachi. They sell only JAS-certified organic products.
- **Grocery story by Nijo Castle**
  Did not contain any organic produce. It had a much larger selection than Fresco and was on the first floor of a department style building.
- **Zero Waste Market**
  Grocery store that aims to reduce both plastic and food waste. Market sells all organic produce, snacks, and food. Some products were JAS organically certified, but others were not. Although not all produce was JAS certified, the workers claimed that all produce and products were locally sourced and organic. Prices were low-cost, and some produce was cheaper than average market prices. Produce was not packaged or wrapped in plastic. Products and other foods and snacks were stored and jars, and measuring cups, scales, and other similar tools were provided to take how much of an item you wanted.