



# Blurring the Boundaries: How an Emerging Group of Urban-Integrated Farmers in Singapore Are Changing the Profile of Farm Labour

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## Abstract

Food production is no longer seen as exclusively a rural function by urban planners; it has become a common trend in urban areas, with urban farms increasingly set up in spaces that are traditionally not used for agriculture. In Singapore, the formal urban agriculture industry began to emerge in early 2010s, with informal community urban gardening dating back to WWII with the victory garden movement an early precursor. The first urban farm in Singapore was founded in 2011, and urban farming has become an industry that is constantly growing and evolving. There is an on-going transition from traditional to high-tech approaches that is changing the way the farming industry requires labour—and the demographic profile of the urban farmer. To understand the unique qualities of the type of labour force hired by urban farms, this paper compares the labour profile of urban farms with the commercial farming industry in Singapore through a series of interviews with farmers. We conclude with a discussion on what it could mean for the future of labour force within the urban farm industry in Singapore, as well as potential broader implications.

## Keywords

Urban farm · Urban farmer · Labour · Farm worker

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215

## 12.1 Introduction

Singapore is a food-crazed nation—with food stall cheap eats in “hawker centres” to fine dining and everything in between offering a range of local Peranakan to global western and Asian fusion dishes (Kong 2015). Despite being a country of foodies with an array of cuisines easily available to all Singaporeans, the majority of produce is actually imported from other countries. About 90% of food is imported, making Singapore heavily dependent on food imports (SFA 2020; Diehl et al. 2020). With less than 1% of farmland dedicated to agricultural purposes and only half of that zoned agricultural land dedicated to growing food (SFA 2020), Singapore appears to have a limited amount of space set aside for food production. With high-entry barriers to setting up farms in Singapore, a group of urban farming enthusiasts began sourcing for underutilized spaces such as vacant state land, rooftops, and indoor spaces as potential farming spaces in 2012, thereby decreasing the limitations due to lack of land available for urban farming (Elangovan 2019). Since 2012, at least 15, of what we in this paper call, urban-integrated farms have been set up, with 6 urban farm operators growing at multiple locations across Singapore. From soil-based farming on rooftops to vertical farming systems that utilize A-frames adopting hydroponic systems, as well as indoor-LED farming, many urban farms maximize the limited area available for food production either through a creative use of rooftop spaces or through a range of high-tech production methods. With the adoption of technology in production methods, urban farms are able to rely on a much smaller labour force (Ludher and Tan 2019). The transition from traditional to high-tech approaches has changed the way the farming industry requires labour. A number of urban farms in Singapore such as Edible Gardens City, Comcrop, and Vertevgies only require two to three employees to run the day-to-day farm operations. This is because many of the operations—from watering of plants to measuring the moisture of the soil—are computerized and automated, as compared to traditional farms that are often dependent on manual labour. This paper seeks to understand how farm labour is changing in Singapore by comparing urban-integrated farms with traditional commercial farms—specifically, differences in background and skills, educational level and wages, and motivation to work as farm labour. We define traditional commercial farms as farms that occupy zoned agricultural land (Fig. 12.1), while urban-integrated farms are defined as farms that occupy underutilized spaces such as rooftops and vacant state land (Fig. 12.2).

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## 12.2 Overview of the Changing Farming Industry in Singapore

The traditional commercial farming industry is a sunset industry, with many young people shunning it due to the manual and intensive nature of work required (Kelsey 2015). This is a global phenomenon that is not unique to Singapore. Farming in Singapore has often been viewed as a job that is less glamorous compared to white-collar jobs (Mannan et al. 2017). With a population that is highly educated, many



**Fig. 12.1** Image of a traditional commercial farm. (Source: C. Sia)



**Fig. 12.2** Image of an urban-integrated farm. (Source: C. Sia)



**Fig. 12.3** A commercial farm that has adopted hydroponics system to grow. (Source: C. Sia)

Singaporeans would opt for a desk job rather than a job that requires long hours of manual labour under the relentlessly hot, tropical sun (Fig. 12.3).

To rectify this problem, the Singapore government has encouraged many farms to adopt high-tech systems to reduce reliance on manual labour (URA 2018). This is heavily encouraged through a \$46 million USD Agriculture Productivity Fund introduced by the Singapore government for any commercial farms that would like co-funding for the high-tech farming systems the government would like to adopt. Commercial farms that have adopted a high-tech system (such as a hydroponics growing system) using the Agriculture Productivity Fund are more likely to have their leases renewed when they tender for new land. However, high-tech prioritization has created a new set of problems—with the cost of setting up farms to be of astronomical figures of around \$1.1 million USD—creating huge financial barriers for young farmers who may want to enter the farming industry (Kok 2017; Michelin Guide 2019). On top of high-entry barriers to farming due to costly adoption of technology, commercial farm owners are also required to make an upfront payment of 10 years of land lease fees, a large investment making it difficult to start a farm.

Three quarters of land in Singapore is government owned, and the Singapore Land Authority (SLA) is responsible for development and regulation of land resources. Currently, agricultural land is being leased out in 20- to 30-year time periods by the Singapore Food Agency (SFA as of 2019; formerly the Agri-Food and Veterinary Authority (AVA) of Singapore), the government agency tasked with managing agricultural land leases. A combination of financial costs, uncertainties on land leases, and the physically demanding nature of the job has made it difficult for

farms to sustain their livelihood in Singapore. And, on top of that, there are government mandated minimum productivity targets. To ensure there are enough farm workers to produce food crops in Singapore, many commercial farms have turned to foreign labour (refer to Chap. 14 for more details).

To gain insight on the farming industry related to the changing profile of the labour force in Singapore, semi-structured interviews were conducted with both traditional and high-tech commercial farms, specifically urban-integrated farms, between December 2018 and January 2020. Interviews were conducted with commercial farm owners or managers ( $n = 12$ ) and urban-integrated farm owners ( $n = 4$ ) and workers ( $n = 8$ ) (analysed together). A list of 35 commercial farms were sourced, and more than 20 were contacted; all urban-integrated farms were invited to participate. Audio recorders were used to record the interviews and later transcribed. No interviews were carried out with commercial farm workers due to language barriers, but observations of the commercial farm workers were made that contribute to this paper. This research was approved by the National University of Singapore Institutional Review Board (NUS IRB).

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## 12.3 Agricultural Background

To understand how background knowledge, experience, and existing agricultural skills contribute to joining the farming industry, we asked interviewees from the both the commercial farms and urban-integrated farms what their previous jobs were (if any), as well as any family involvement in farms that may have led to their employment in a farm.

### 12.3.1 Commercial Farms

One-third of the interviewed commercial farm owners ( $n = 4$ ; 33%) had always worked in the farming industry—either at the present farm or at another farm operation. The majority of commercial farm owners and managers ( $n = 10$ ; 83%) had prior experience in agriculture as most of them grew up in a farming family. They had either helped out during their school holidays when they were young, or had worked for a short period of time in their family farm or on another farm. Many pursued non-agricultural studies and careers, but eventually took over the family business again:

*I was the son of the oldest farmer, which means that if you consider that, then I've been farming ever since I was born, but I really got involved in farming during my secondary school days. My first maiden bus was to the farm, and there I found my paradise and my wonderland—so many things to do, so much, so exciting. It's a very new horizon or new set of interests there when you know, so many things in the city or in the urban area, you cannot image to have this fun, this type of joy, talking about longkang [drain] fishing, catapult, hunting, and all these things. You can only do these things in the countryside, so I found my*

*joy there, my wonderland there. So holidays, that's my vacation area. (Multi-generational commercial farm owner)*

In comparison to the lead farmers who were often multi-generational Singaporean farmers, the majority of the hired farm workers working in commercial farms were immigrants from developing countries including Thailand, Bangladesh, and Myanmar. Many commercial farm workers were also farmers in their country of origin, either as commercial farmers or involved in subsistence farming as a way to supplement their income or to feed their families. As a result, many had experience in farming, with specific knowledge in traditional farming. The Singapore farm owners who currently still adopt traditional ways of farming have mentioned that their farm workers were able to give them some tips in terms of improving day-to-day operations within the farm. But, as many commercial farms in Singapore have adopted some form of high-tech system to improve crop yields and intensify crop production, the knowledge in traditional farming that many foreign farm workers have is not always transferable to the commercial farms in Singapore. Due to the vertical nature of the employment hierarchy within commercial farms, foreign-hired commercial farm workers generally do not get promoted to farm manager due to the transient nature of their employment; many of the migrant workers move to Singapore for a short-term period to gain employment, then move back to their home country after they have stayed for a period of at least 2 years. Some of the hired commercial farm workers do take on more of a “supervisor” role if they have stayed for a longer period and are able to communicate efficiently to other farm workers who are from the same country or hometown:

*Yes my workers back in Myanmar, they are all the country boys so at least they farm most of the time, but of course quail farming is something new to them. Yeah, we do ‘old bird teaches the new bird’ type of method, so that’s how we train them. And we rotate our job scope, that means they must be well-versed in everything, so in case one is on leave, all of them can actually chip in and cover up the person on leave. (Commercial farm owner)*

### **12.3.2 Urban-Integrated Farms**

When asked about previous jobs, urban-integrated farmers came from a variety of backgrounds ranging from those who worked in the food and beverage industry to those who were in the engineering industry. One-third ( $n = 4$ ; 33%) were from the food and beverage industry, noting that being in the food and beverage industry had made them question where the ingredients of their dishes came from.

*I’ve been trained as an aerospace engineer, and then I went to culinary school—so I’ve never been officially trained at all as a farmer. Being in the culinary field, I was very interested in cooking, and slowly I realised I was interested in where food came from. So I wanted to explore how that journey would start from food being produced. (Urban-integrated farmer)*

Most of the respondents ( $n = 5$ ; 42%) also mentioned that they wanted an entire change in industry, hence joining the farming industry. The majority of urban farmers ( $n = 8$ ; 67%) who turned to urban farming as a career choice had no prior farming experience except volunteering short-term at a farm. Only one-third ( $n = 4$ ; 33%) had volunteered on an urban farm before joining the industry, including one respondent who was previously in horticulture before switching to the high-tech urban agriculture industry.

*I needed to look for a company to do an internship for my final year project, so I volunteered and did an internship here [at this farm] for my school project. So that was six months, and after that I renewed my contract; I continued my contract here. Actually my contract ended in May, I just continued working here. Yeah, it was my first job [in agriculture].* (Urban-integrated farmer)

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## 12.4 Characteristics of Urban Farm Workers

To understand why farm workers to joining the farming industry, a series of questions on their educational level, wages, motivations as well as farm's involvement in the community were asked to gain a better understanding of what the pull factors are for joining the farming industry.

### 12.4.1 Education Level and Wages

Questions on educational background, educational level, and wages were asked to understand if educational background may have contributed to choosing farming as a career. We also wanted to understand how wages were compared to Singapore's median income.

#### 12.4.1.1 Commercial Farms

As mentioned, all farm workers at interviewed commercial farms were foreigners. High labour costs and the difficulties in attracting local Singaporeans to engage in manual and/or outdoor work have resulted in Singapore's commercial farm labour being almost entirely made up of foreign workers. Based on the information provided by commercial farm owners and managers, the starting pay for (foreign) farm workers ranged from \$800 up to \$1200 (\$564 to \$847 USD), with some drawing overtime pay or a bonus for work in additional to standard work responsibilities.

*Compensation should be about \$1000 SGD [\$706 USD], it depends on the hours they work, it's an hourly rate. I don't remember the rate. It depends on performance, every farm has a supervisor, when their contract is about to expire and due to renewal, if they want to continue working and have a pay raise, they will mention it to the supervisor and the supervisor will approve/reject it depending on their performance.* (Commercial farm manager)

### 12.4.1.2 Urban-Integrated Farms

Most urban-integrated farm owners ( $n = 3$ ; 75%) and workers ( $n = 5$ ; 62.5%) were degree holders and more than one-third of the workers were diploma holders ( $n = 3$ ; 37.5%) in areas such as engineering, horticulture, social sciences, education, and business. They were all Singaporean citizens; none was foreign-born.

In Singapore, the median pay is approximately \$4400 SGD (\$3104 USD), while the median starting pay of graduate degree holders and graduate diploma holders are \$3500 and \$2350 SGD (\$2469 and \$1657 USD), respectively (Tan 2020). Despite more than half of urban-integrated farmers holding graduate degrees, starting pay is low with most pay ranging between \$2000 and \$2500 SGD (\$1411 to \$1764 USD) and less than a quarter commanding a pay above \$3000 SGD (\$2116 USD). Some receiving less than \$2000 SGD (\$1411 USD) as the urban-integrated farming industry, while growing, is still a niche business:

*I get less than \$2,000 [SGD] per month. For full-timers, the pay ranges from less than \$2,000 to more than \$3,000 and different people have different pay. The average working hours are 44 hours per week for a 5-day work week. The hours are similar to what you get in a corporate scene, from about 9am to 5pm. (Urban-integrated farmer)*

Three urban-integrated farmers also hired differently-abled individuals, as well as elderly, to be involved at different stages of the farming operation, from seeding to germination. On weekends, some farms also welcomed volunteers to help out on the urban farm. Some farms qualified for government subsidies for hiring differently-abled individuals as part of government schemes to encourage the employment of differently-abled individuals.

## 12.4.2 Motivation

Questions on why farm workers or managers chose to work in the farming industry were asked to find out what the motivations were due to the strenuous physical requirements to conduct the work.

### 12.4.2.1 Commercial Farms

When asked why commercial farm owners had chosen to remain in the industry, many reported farming as a lifestyle choice ( $n = 8$ ; 66.7%). The main reason to continue farming in Singapore was because their family had been involved in farming for many years ( $n = 9$ ; 75%). However, most commercial farm owners also acknowledged the difficulties of sustaining farming in Singapore, and would rather not continue farming if they had the financial resources to exit the industry. On the other hand, similar to urban-integrated farmers, the motivations of commercial farmers were to produce enough to feed people and to be away from the “hustle and bustle” of the city. In the below excerpt from a commercial farm owner, he is motivated simply by being able to grow beautiful vegetables that taste good for people:

*We are here, we are surviving because we are not motivated by how much I get [paid]. We enjoy people saying 'your vegetables taste good!' But, if kids are going to come here and say, 'I have a big paycheck, hao lui [hokkien for good many], that's different altogether. I'm motivated by someone who comes and say, 'It's true, wahhh [Singaporean particle used for inflection] your vegetables are so nice!' Wahhh, I feel good you know? (Commercial farm owner)*

We did not directly ask what the motivations of the commercial farm workers were for farming in Singapore, but financial reasons could be a main factor. Many commercial farm workers are from developing countries and the wages in Singapore are substantially higher than in their home countries.

#### **12.4.2.2 Urban-Integrated Farms**

Many urban-integrated farm owners ( $n = 3$ ; 75%) cited improving food security and contributing to the food system as the main factor. On the other hand, urban farm workers were generally more motivated by a working environment that was drastically different from their previous line of work or to be part of the food system that served a social good or had an educational purpose. A number of urban farm workers cited the importance of educating the public about local produce being superior and just as good as imported produce:

*We are so dislodged from the natural world. Our government did a very good job by planting up all the streetscape spaces, parks, whatever, just do as much as they can to spice up the greenery we have in our city. But ultimately we are still very not close together with nature, you see it but you don't really touch it or feel it or smell it. But by doing urban farming you have to take care of your plants and that's where you are actually in touch with nature rather than seeing nature. (Urban-integrated farmer)*

#### **12.4.3 Community Involvement**

Farms can be involved in the community to varying degrees. Community involvement enables the farmer to have a better understanding of the profile of the customer they are able to reach out to and to tap into part-time labour or volunteers.

##### **12.4.3.1 Commercial Farms**

Commercial farms typically were unable to accommodate volunteers to come in due to strict food safety regulations by Singapore Food Agency (SFA). Hence, the level of community involvement at commercial farms was low. A small number of farms in Singapore did hold educational farm tours as a way to educate school-age children where food comes from. Agri-tourism through workshops and farm tours have been ways to help local commercial farms supplement their income in addition from sales of their produce.

### 12.4.3.2 Urban-Integrated Farms

As mentioned, many urban-integrated farmers did not have prior farming experience. The benefit of this trend is that it has helped to lower the entry-level for volunteers who are keen on trying their hand at food production. A number of urban farms also hire individuals with special needs, as well as elderly, who would like to stay active. By involving people with different learning needs, as well as elderly, the community involvement of urban farms was quite high. Notably, farms involved with community activities were rooftop or land-based farms—not indoor-LED urban farms due to the stringent climate control requirements of indoor farms.

*That one [farm] actually has a more direct impact on community. So when we were starting out the farm, actually our model is we want to create a circular economy within each neighbourhood, so for instance the vegetables we grow there, they are actually grown by residents that we hire from the nearby Asian Women Welfare Association organisation. . . we have a partnership there, so we hire the elderly from there on a part-time basis, they come over at certain timings when it's not too hot, where it's appropriate for them to do some work, and they help us with our farming process, they help us to maintain our farm. They come, then they cook for one another, they go about diligently doing their work. The oldest one is actually 80-years-old. So it's very heartening to see that, like we are able to provide this kind of opportunity for them to grow some vegetables instead of staying at home. (Urban-integrated farm manager)*

In a number of urban-integrated farms, that were not indoor, the community was welcomed to participate not only as a volunteer, but also to purchase and harvest fresh crops directly from the farm even as a consumer, giving people the opportunity to understand how crops were grown and to be part of the process:

*If you would like to do your own harvesting, our self-harvesting session only begins at 5pm so do drop by after 5pm if you are keen to harvest your own pesticide-free lettuces! (from an urban-integrated farm's Facebook page)*

Based on the interviews with commercial farm owners and managers, as well as urban-integrated farm owners and workers, it seems that the profile of farm workers has shifted significantly from unskilled farm labour toiling in the commercial farms, to degree and diploma graduates working under the sun in urban-integrated farms. It is evident that urban-integrated farm graduates were not motivated primarily by wages as urban-integrated farm workers were compensated below average pay. But, they were strongly motivated by the concept of growing food locally and contributing to the local food system. The lack of experience did not hinder urban-integrated farm workers, as compared to commercial farm owners and managers who had grown up in farming families.

## 12.5 Food Crisis and Farm Labour

With the recent Covid-19 global pandemic, there is a need more than ever for local urban food production to be increased—to buffer disruptions caused by lockdowns and closure of borders between countries. While many people face the risk of unemployment, pay reduction, and potential loss of jobs and income in the future, the local farming industry offers a certain level of job stability. Singapore government policies are encouraging local farms to increase production in order for the country to withstand any disruptions, while it is business-as-usual case for many farms to continue working, and increase productivity to cope with several bouts of panic buying that happened in 2020 (Quek 2020). Similarly, the food price hike in 2007 to 2008 drove 44 million people worldwide into poverty, resulting in political and economic instability (World Bank 2008). By having a food system that is more self-reliant and more self-sufficient, a country is able to avert a similar food crisis as such, and able to provide its citizens a sense of security in terms of food supply.

With most research on urban-integrated farming related to yield and technology, this chapter investigated the socio-economic aspect of urban farming. The objectives were to look into the farming labour of both commercial farms as well as urban-integrated farms to gain insight into the people who are involved in farming, their motivations, and how they are involved in the community. By asking questions about their family background, existing skillset (if any), education level, wages, what drives them, as well as how the community could participate in the farms, it enabled us to draw some conclusions on who the traditional farming industry or the urban-integrated farming industry is likely to attract into its labour force.

We found that many traditional farm managers, as well as urban-integrated farm workers, were not only tertiary educated, but also driven by the passion to understand food, despite not studying in an agricultural-related field. Most farmers involved in the urban-integrated farming industry were also not from farming families that would have exposed them to food production activities since young. Rather, they typically became involved in urban farming initially via volunteering or through internships. Given that wages of those working in the urban-integrated farming industry are highly uncompetitive, passion for food and the desire to lead a more sustainable lifestyle seems to be the primary motivating factor to enter into the industry.

If more time was allowed, it would have been useful to hire an interpreter to interview the commercial farm workers largely made up of migrant workers from Bangladesh, India, Thailand, and Myanmar, and carry out similar interviews to understand their educational background, motivations, skillset, and any community involvement. A much bigger sample of respondents from both commercial farms and urban-integrated farms would also strengthen the results of this research.

## 12.6 Looking to the Future

Urban-integrated farming is a nascent industry in Singapore, but has the potential to provide employment for Singaporeans with or without prior experience or any expertise in farming. SFA has a 30 by 30 vision of increasing domestic food production to 30% and reducing reliance on food imports (SFA 2020). It requires increased output from both local commercial farms and urban-integrated farms, translating to a need for more people to get into the agriculture work force (Seow 2019). While many of these farms are required to adopt high-tech systems to increase productivity, it will likely still be necessary for commercial farms and urban farms to hire people. There is also a new Republic Polytechnic programme solely targeted at young adults studying urban agriculture, as well as government policies that are more favourable in terms of conditions for the establishment of urban farms as compared to commercial farms; there is potential for the urban farming industry to establish itself as a significant stakeholder in local food production, and increase demand for local food production. This in turn may increase the urban farming industry's starting pay, making it slightly more attractive to locals in Singapore to consider being urban farmer as a career, hence attract more local Singaporeans to get into the urban farming industry. This is important given Singapore's high cost of living, where a pay closer to the average starting pay of young adults may be more likely to retain urban farming talent committed to producing food for the local people.

The image of farming has also changed drastically with high-tech farms now declaring that "farms were not cool, but now they are" (Quek 2020). In this study, the results, based on interviews, demonstrate that the stereotype that the farm industry is a career for the less educated is being de-stigmatized; there is an increasing number of young and educated individuals entering the urban farm industry as farm workers, despite lower pay than the average graduate starting pay. They are motivated more by the intrinsic values of farming, as well as potential contribution to the local food system. However, if Singapore is looking to increase domestic food production to the target of "30 by 30," it needs to demonstrate a sustainable demand for local vegetables, that can in turn translate to sustainable profits for the urban farming industry and wages for the urban farmers. This will not only attract and retain even more individuals to join the urban farming industry, but also provide a case for the government to support the growth of the urban farming industry in Singapore.

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