

# Successes and opportunities for horticultural initiatives amongst migrant workers and Singaporeans: Learnings from three projects

text and images by  
Bjorn Low  
Adeline Chang

“

These efforts showed a recognition at all levels of the importance of and interlink between food security, access to nature, and mental well-being – and of their effects on workforce productivity.

## Introduction

Singapore is a highly developed economy that taps heavily on foreign workers in certain industries such as the construction, manufacturing, and services sectors. Numbers in the foreign workforce stood at 1,305,800 in June 2022 (Government of Singapore, 2022a), with many originating from countries such as Bangladesh, India, Myanmar, and China (Government of Singapore, 2022b).

Nationally, the issue of food security has been high on the public agenda in recent years, moving further into the limelight following the disruption of global food supply chains during the COVID-19 pandemic outbreak. The Singaporean government had in 2019 set a target of locally and sustainably producing 30% of residents' nutritional needs by 2030, and from 2020 onwards focused by necessity on diversifying food sources and addressing logistical challenges to ensure that Singapore's population continued to have access to food supplies (Wong, 2022). Along similar lines, a study on Bangladeshi Workers in Singapore has highlighted the lack of access to quality food for the population (Dutta, 2015).

The pandemic and the ensuing restrictions placed under stress both access to food as well as mental wellbeing and saw the emergence of grassroots trends as well as governmental efforts to mitigate this. The strictest movement restriction was during the circuit breaker (April to June 2020). Even then, residents during this period could leave their homes for solo outdoor exercise and nature activities (Government of Singapore, 2021). Concurrently, local interest in growing edible plants at home grew steeply (Chew, 2020), more hobbyists started growing ornamental plants to support their own emotional health (Lee, 2020), and the National Parks Board launched a "Gardening with Edibles" program, which saw free seed packets being distributed to interested households to encourage edible home gardening (National Parks Board, 2020). These efforts showed a recognition at all levels of the importance of and interlink between food security, access to nature, and mental well-being – and of their effects on workforce productivity.

Spending time in nature is linked to a myriad of cognitive benefits as well as increased happiness and prosocial behaviour (Weir, 2020), whilst food insecurity is correlated with poorer mental health, likely mediated by chronic stress (Leung, 2019). Given the connections between access to food, access to nature, and mental well-being, and the large numbers of migrant workers in Singapore, initiatives that bring these elements together could significantly improve the lives and well-being of a large proportion of Singapore's population.

This article elaborates on three edible gardening initiatives that were undertaken by Edible Garden City (EGC) with the migrant worker community around the issues of food insecurity, access to nature, and mental wellness. It looks at the challenges and successes of each initiative as backed by academic research and summarises useful learnings that can support the effective planning of future edible gardening initiatives, for the benefit of migrant workers and Singaporeans alike.

### Initiative #1. Migrant Worker Visit to Edible Garden City (2019)

As part of EGC's engagement with other community groups, the urban farm at EGC's headquarters hosted a group of 20 migrant workers in 2019. Many of these workers hailed from the Indian subcontinent and were undergoing work injury claims or disputes.

Migrant workers in such situations are often supported by various non-profit organizations, including SDI Academy, a Singapore-based social enterprise that aims to empower migrant workers through education. SDI Academy conducts English language, IT, computer literacy, and entrepreneurship classes, supporting participants to pick up skills to assimilate and improve their quality of life. As part of their entrepreneurship program, a visit to an urban farm was arranged to pique their interest in alternative food production systems.

The farm tour was undertaken by the EGC team, who brought participants through a rotation of stations, moving from indoor farming to insect farming, and finally to the outdoor regenerative gardens.

“

It looks at the challenges and successes of each initiative as backed by academic research.

**Fig 1 & 2.**  
Participants visiting the urban farm at Edible Garden City headquarters



The following observations were made:

1. Indoor Farm: Participants were intrigued by the mostly clean and sterile grow rooms and the use of lighting technology to grow vegetables that were largely unfamiliar to them. They were given a chance to taste the produce and were surprised by the flavor profiles of the microgreens. They were curious too about the need for a controlled environment for the growth of these microgreens and the associated cost-benefit of such a system.

2. Insect Farm: The black soldier fly farm demonstrates the operation's ability to convert organic waste into high-value fertilizer and animal feed protein. Participants were excited by the novel use of an insect for farming and were able to identify the black soldier fly as a species they had observed back home. During the session, the farm's resident rooster was present, and participants interacted with and fed black soldier fly larvae to the rooster. During the follow-up discussion, a handful of participants mentioned the possibility of replicating this model of insect farming in their home villages, to reduce waste issues whilst supporting farmers in their local community.

3. Outdoor production gardens: Participants were able to identify many of the less commonly grown tropical native crops, such as the Moringa oleifera tree. They discussed different ways of preparing food using the moringa leaves, with some reminiscing about life on the farms back home.

#### Impact on Participants

Whilst the outcome was largely anecdotal and observed through the tour and discussion session, the outlined observations indicate that the visit to an active urban farming space helped create dialogue around food practices and food memories and facilitated an exchange of knowledge between the migrant workers and the EGC team. It points towards the embedded knowledge that many migrant workers have about agriculture and native plants, which have the potential to add value to Singapore's ecosystem in ways that have not yet been leveraged.

#### **Initiative #2. Therapeutic Horticulture Intervention at a Migrant Worker Dormitory (Oct-Nov 2021)**

Approximately 323,000 migrant workers reside in dormitories in Singapore. A study during the COVID-19 pandemic lockdowns had found increased symptoms of depression and stress in the group (Goh, 2021). This encouraged the private companies managing the dormitories to consider mental health programs for the wellbeing of their workers.

In mid-2021, EGC formalized a therapeutic horticulture program for a privately managed dormitory, in collaboration with social enterprise platform We the Good and construction and civil engineering company Woh Hup. The engagement was designed and delivered in a series of seven instructional videos, spread over four weeks.

Week 1	Welcome and set the scene Sowing seeds and plant care
Week 2	Garden maintenance part 1: Pruning, fertilization, harvesting Garden maintenance part 2: Pest control
Week 3	Transplantation and propagation by cuttings
Week 4	Nature and art ideas and trellis set up Harvesting and plant use

**Table 1.**  
The therapeutic horticulture program was designed and delivered in a series of seven instructional videos, spread over four weeks.

“

This encouraged the private companies managing the dormitories to consider mental health programs for the wellbeing of their workers.

**Right / Fig 3.**  
A participant attending to young plants that require staking



At the start of the programme, each participant received a kit containing all the materials needed to set up their own garden plot, including a grow bag, soil media, seeds, plants, a watering can, and natural fertiliser. The programme videos guided them through the process of setting it up, covering both theoretical and practical components.

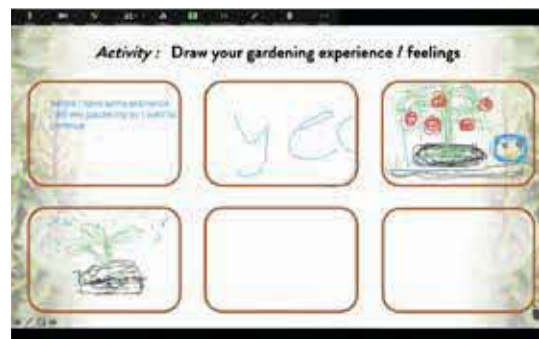
At the start of each week, participants watched the assigned videos and completed the homework for the week (activities included germinating seeds, repotting, pruning, stem-cutting propagation, trellis setup, and the like). At the end of the week, a live virtual session was held to facilitate connection between participants. These live virtual sessions were initially planned to be based on open sharing from participants, but were adapted, following observations of participant engagement and the impact of language barriers, to become more structured and directive. The facilitator shared information, used more visuals, scaffolded verbal sharing from participants, and moved the live sessions at a generally faster pace to maintain participant engagement.

### Challenges

This engagement faced several challenges, bringing significant learning points for the organisers. With COVID-19 conditions rapidly shifting, the program attracted only six participants as construction work restrictions were lifted in August 2021 (Building and Construction Authority, 2023) and FMWs returned to work, sometimes taking up double shifts. Simultaneously, continued movement control measures in the dormitories prevented the team from conducting in-person classes, and a virtual platform had to be used instead, which posed limits to the forms of engagement.

Other challenges included:

1. Communication and language: Language barriers and inadequate translating capacity were a significant obstacle and slowed/limited verbal exchange (as an illustration, sharing was smooth and effective from one participant with a good command of English, but very limited from the remaining participants, who spoke less English). This barrier was mitigated via some support from translating staff, the use of accompanying visuals to clarify the facilitator's questions and how-to explanations, and the bringing in of drawing as a complementary way for participants to share their experiences.
2. Attendance: Attendance at the live virtual sessions was not an indicator of participation in the gardening activities – the latter was in fact higher as some participants consistently sent photos of their growing plants in the chat group but did not make it for the live sessions. Reasons included the desire to sleep after completing a night shift, and falling ill with COVID-19. This drop in attendance might be ameliorated if sessions were better timed to match the rest hours of workers, and/or if the sessions included even more new information that was not shared during the video, to encourage participation.
3. Assessment of activity completion: The language barrier and busyness of participants made it initially difficult to assess during the live sessions whether participants had managed to complete the assigned tasks or if they had run into difficulties. This was addressed thereafter by asking these questions via Zoom polls and following up verbally to ask for more details where necessary.



**Fig 4.**  
Questions via Zoom polls



**Fig 5.**  
Interactive zoom session

	No	Yes (a little)	Yes (medium)	Yes (a lot)
Did gardening reduce your stress?	0	1	3	0
Did gardening make you feel more empowered / in control?	0	1	2	1

**Table 2.**  
Results from post-program survey

### Impact on Participants

A post-program survey was carried out to assess the outcomes of the horticulture intervention. Two participants did not attend the final virtual session and could not be supported to complete the survey. The remaining four participant respondents, with the help of the interpreter where required, rated the intervention’s impact on subjective stress and empowerment. For all responding participants, the intervention was successful at reducing subjective stress and increasing their sense of empowerment.

Across various studies, subjective stress severity better predicts poor health than exposure to stressors (Shields et al., 2022), whilst a sense of control (internal locus of control) has been linked with better general wellbeing and reduced symptoms of depression (Khumalo & Plattner, 2019). The survey thus suggests that the edible gardening intervention successfully improved participants’ mental wellbeing.

In addition to the original aim of addressing mental wellness challenges faced by the community of migrant workers living in dormitories, other positive impacts were observed as well. Through anecdotal sharing, the team noted that the introduction of an edible garden within the dormitory setting had the additional effect of bringing a small community of like-minded individuals interested in horticulture/ agriculture together.

Their varied backgrounds allowed for an exchange of knowledge, as prior experience with growing ranged from almost none to years spent working on family farms and maintaining community gardens. The activities also provided a backdrop for spontaneous creative expression, with one participant taking the initiative to create a lively video of everyone setting up their personal garden plots, set to an energetic music backing track, in which friends could be seen helping each other out within the limits of the distancing measures that were still in place at the time.

This simple intervention also attracted the interest of other dormitory residents, with reports of plant pilferage indicating that more dormitory residents would be interested in gaining access to fresh herbs and vegetables.

Ultimately despite the significant constraints posed by COVID-19 restrictions, shifting conditions, as well as available translation expertise, the therapeutic horticulture intervention was successful in having a sizeable positive impact on participant’s mental wellbeing.

**Initiative #3. Rotary Club project engaging migrant workers and Singaporeans (Jan to Mar 2022)**

This initiative aimed to provide engaging opportunities for migrant workers and the local Singaporean community. In collaboration with the Rotary Club of Singapore and SDI Academy, EGC aimed to have the initiative bring attention to three key issues: food security; mental wellness, and community participation.

From January to March 2022, over the course of eight weeks, Singaporean members of the Rotary Club participated in the growing and care of twenty *Moringa oleifera* saplings. This species was intentionally chosen to acknowledge its significance as a food source for many in the region. All parts of the tree are edible, with the leaves and seed pods being particularly popular for cooking fresh, or drying and grinding into a powder. As one of the most economically valuable species native to South Asia (FAO, 2023), the *Moringa* tree is both culturally and economically relevant for a large proportion of our FMW communities. The initiative culminated in a mental wellness workshop attended by migrant workers and Rotary Club members, joint planting of the saplings, and a shared meal.

To begin with, participating members took part in an EGC-run workshop where they learnt how to plant and nurture *moringa* plants. They received instructions on seed sowing and propagation of the *Moringa* plant, propagated *Moringa* cuttings, and took the transplanted cuttings back home.

With the help of the EGC horticulture team's advice on home care, these *Moringa* saplings were nurtured by the Singapore Rotarians. These saplings would later be planted with the migrant workers, at a location near the dormitories, serving as one key focal point for the social exchange between the Singaporeans and migrant workers during the subsequent event.

The culminating event eight weeks later involved a mental health workshop developed by the SDI Academy, with support from EGC for the tree planting activity. It took place at Terusan Recreation Center, chosen due to its vicinity to the dormitories, its existing community garden, extensive grounds and the presence of an accessible recreation centre.

“

For all responding participants, the intervention was successful at reducing subjective stress and increasing their sense of empowerment.

**Left / Fig 6.**  
Moringa saplings nurtured by the Singapore Rotarians



**Right / Fig 7.**  
Mental health workshop segment developed by the SDI Academy



“

The programme helped to support social connection amongst migrant workers, as well as between migrant workers and Singaporeans via meaningful conversation, enjoyable shared activities, and time spent exposed to nature.

This workshop included the following activities, designed to expose participants to concepts supportive for improved mental wellbeing:

1. Growth mantra: To inculcate the mindset and confidence that we are all on our journey of growth to becoming the best version of ourselves.
2. Describe your apple in unique way: To showcase everyone's uniqueness despite looking similar on the outside, just like their apple.
3. Relationship to Self, Others and Planet: To find a balance in taking care of all 3 aspects.
4. Mindful eating, breathing, journaling: To learn helpful habits of mindfulness in daily activities and journaling of thoughts and worries.

Through these activities, many participants opened up about themselves and shared childhood memories and experiences borne of vastly differing life circumstances, whilst also acknowledging shared humanity.

The highlight of the day's workshop was the planting of edible plants into the ground. In groups comprising both Singaporean Rotarians and migrant workers, participants transplanted the nurtured *Moringa* saplings as well as other culturally-relevant herbs like the Indian Borage (*Coleus amboinicus*) into the soil.

Following this, participants shared a meal in their respective groups to mark the completion of the program. Interestingly, there was significant food waste during the meal sharing despite the assumption of significant food insecurity, which might indicate high individual variation or a necessity for more consultation with migrant workers on their needs.

**Fig 8 & 9.**  
Meal sharing during the program





Fig 10 -12.  
Participants and volunteers planting edible plants

“

This initiative was subsequently renamed “Seeds of Friendships”, with a goal to sow and nurture 1000 friendships.

#### Impact on Participants

The programme offered a platform for meaningful exchange and the forging of friendship bonds between the migrant worker community and a concerned citizenry group, via undertaking a series of common tasks and sharing life experiences. Positive exchanges and bonding during and after the programme were highlighted via the following observations:

1. Open and honest conversation, with memories and childhood stories shared during the mental health workshop and tree planting session;
2. Lively exchanges between participants during the shared meal;
3. Contact details spontaneously exchanged between different groups of participants; and
4. Positive and consistent post-event comments on a Facebook group created to support continued engagement.

The programme helped to support social connection amongst migrant workers, as well as between migrant workers and Singaporeans via meaningful conversation, enjoyable shared activities, and time spent exposed to nature. Apart from enhancing social connection and prosocial behaviours (Goldy & Piff, 2020), exposure to nature also produces a variety of pleasant emotions, from relaxation and gratitude to excitement, vitality, and awe, depending on the specific situation (Capaldi et al., 2015, as cited in Zelenski, 2020), which facilitate the creation of shared positive experiences. Limits of the short-term engagement notwithstanding, the initiative and its culmination in the three-hour workshop leveraged this to support the connection of migrant workers within a broader community.

This initiative was subsequently renamed “Seeds of Friendships”, with a goal to sow and nurture 1000 friendships.



## Discussion

The above engagements with the migrant worker community brought certain insights to the fore.

1. There is an untapped opportunity for mutually beneficial exchange of agricultural skillsets and edible native plant knowledge between migrant workers and Singaporeans. Migrant workers have a lived knowledge of tropical agriculture and edible and native plants from their home countries, and an interest in learning about technologies that may help support current practices and livelihoods back home. This complements the burgeoning interest of Singaporeans in home and community gardening, and of the Singaporean government in larger-scale agricultural production. Opportunities for exchanges of knowledge between these groups could thus be mutually beneficial.

2. Therapeutic horticulture is effective at improving mental wellbeing of migrant workers living in dormitories: Therapeutic horticulture interventions are effective at improving the mental wellbeing of migrant workers via reduced subjective stress and increased sense of empowerment, even as high levels of external stressors remain unchanged in other areas of their lives.

3. Nature and horticulture can doubly foster social acceptance and sense of community between Singaporeans and migrant workers, as well as improved mental wellbeing for migrant workers. Positive and meaningful connection amongst migrant workers, and between migrant workers and Singaporeans, can be successfully facilitated via horticultural activities in green spaces. Such activities in nature provide a space for a natural exchange of life experiences, an organic transfer of skills and sense of empowerment for migrant workers, and support pleasant emotions and social connection, thus facilitating a better understanding between Singaporeans and migrant workers that is likely to improve social acceptance of migrant workers. As community attachment is associated with better mental health indicators for immigrants (Dou et al., 2022), platforms that support deeper attachments and bonding to a community are likely to serve the double benefit of improving the mental wellbeing of migrant workers.

4. Successful initiatives will take into account specific work and living arrangements of migrant workers. Given the heavy work schedules of most migrant workers and the limits of their living arrangements, initiatives need to be appropriately structured – either active and adequately fast-paced to retain engagement, or on the opposite end of the spectrum, intentionally gentle and soothing to support rest and recuperation. The challenge of keeping up with regular contact should also be taken into consideration when planning initiatives which span a longer stretch of time.

## Conclusion

The issues of food security, opportunity to access nature, and mental wellbeing are critical issues for all humans which were brought to the forefront of public consciousness by the COVID-19 pandemic. The three initiatives highlighted in this article (migrant worker visit to EGC's urban farm; therapeutic horticulture intervention at a migrant worker dormitory; and Rotary Club project engaging migrant workers and Singaporeans) combined nature, urban farming, edible gardening, and opportunities for knowledge exchange and social connection to address these issues, with positive impacts on mental wellbeing and interpersonal connection.

As the pandemic restrictions fade out, there is a renewed opportunity to plan and deploy similar feasible initiatives on a larger scale, to benefit Singaporeans and migrant workers alike. With the insights gained from these and other initiatives, appropriately structured engagements can be run by private and public institutions, serving to both improve migrant workers' mental wellbeing and food security, and to contribute to a broader public acceptance of the migrant workers community, by leveraging the opportunities for horticultural activity and emotional pleasure that are so generously and equanimously offered by nature.

## REFERENCES

- Building and Construction Authority. (2020, Aug 12). *Further measures to restart the construction industry swiftly and safely*. <https://www1.bca.gov.sg/about-us/news-and-publications/media-releases/2020/08/12/further-measures-to-restart-the-construction-industry-swiftly-and-safely>
- Chew, H. M. (2020, May 10). *Interest in urban farming sprouts amid COVID-19 outbreak*. CNA. <https://www.channelnewsasia.com/singapore/singapore-urban-farming-sprouts-amid-covid-19-outbreak-935486>
- Dou, N., Murray-Kolb, L. E., Mitchell, D. C., Melgar-Quiñonez, H., & Na, M. (2022). Food insecurity and mental well-being in immigrants: A global analysis. *Global Public Health Promotion and Prevention*, 63(2), 300-311. <https://doi.org/10.1016/j.amepre.2022.02.006>
- Dutta, M. J. (2015). Food insecurity and health of bangladeshi workers in singapore: A culture-centered study. *Care White Paper Series*, 7, 1-19.
- FAO. (2023). *Moringa*. <https://www.fao.org/traditional-crops/moringa/en/>
- Goh, T. (2021, Aug 30). *Migrant workers under lockdown in S'pore had higher symptoms of depression and stress: Yale-NUS study*. The Straits Times. <https://www.straitstimes.com/singapore/health/migrant-workers-under-lockdown-here-had-higher-symptoms-of-depression-and-stress>
- Goldy, S.P., & Piff, P.K. (2020). Toward a social ecology of prosociality: Why, when, and where nature enhances social connection. *Current Opinion in Psychology*, 32, 27-31. <http://doi.org/10.1016/j.copsyc.2019.06.016>
- Government of Singapore. (2022a, Sept 15). *Key facts on Work Permit for migrant worker*. Ministry of Manpower. <https://www.mom.gov.sg/passes-and-permits/work-permit-for-foreign-worker/key-facts>
- Government of Singapore. (2022b, Sept 29). *Construction sector: Work Permit requirements*. Ministry of Manpower. <https://www.mom.gov.sg/passes-and-permits/work-permit-for-foreign-worker/sector-specific-rules/construction-sector-requirements>
- Government of Singapore. (2021, Dec 23). *What you can and cannot do during the circuit breaker period*. gov.sg. <https://www.gov.sg/article/what-you-can-and-cannot-do-during-the-circuit-breaker-period>
- Han, K. (2020, Apr 8). *Singapore's migrant workers on front line of coronavirus shutdown*. Al Jazeera. <https://www.aljazeera.com/news/2020/4/8/singapores-migrant-workers-on-front-line-of-coronavirus-shutdown>
- Khumalo, T., & Plattner, I. E. (2019). The relationship between locus of control and depression: A cross-sectional survey with university students in Botswana. *S Afr J Psychiatr*, 25, 1221. <https://doi.org/10.4102/sajpsychiatry.v25i0.1221>
- Lee, J. (2020, Jul 30). *Covid-19 has led to a botanic boom in Singapore as more people become plant parents to relieve stress*. The Straits Times. <https://www.straitstimes.com/lifestyle/home-design/covid-19-has-led-to-a-botanic-boom-in-singapore-as-more-people-become-plant>
- Leung, C. (2019, Nov 25). *How does food insecurity affect physical and mental health?* Forbes. <https://www.forbes.com/sites/quora/2019/11/25/how-does-food-insecurity-affect-physical-and-mental-health/?sh=19b7cc5450d2>
- National Parks Board. (2020, Jun 18). *NParks launches new "Gardening with Edibles" programme to encourage home gardening*. <https://www.nparks.gov.sg/news/2020/6/nparks-launches-new-gardening-with-edibles-programme-to-encourage-home-gardening>
- Shields, G. S., Fassett-Carman, A., Gray, Z. J., Gonzales, J. E., Snyder, H. R., & Slavich, G. M. (2022). Why is subjective stress severity a stronger predictor of health than stressor exposure? A preregistered two-study test of two hypotheses. *Stress Health*. Advance online publication. <https://doi.org/10.1002/smi.3165>
- Weir, K. (2020). Nurtured by nature: Psychological research is advancing our understanding of how time in nature can improve our mental health and sharpen our cognition. *Monitor on Psychology*, 51(3), 50.
- Wong, S. Y. (2022, Jul 6). *Food supply chain resilience during and beyond the pandemic*. Challenge: Trends, Ideas and Insights into Singapore Public Service. <https://www.psd.gov.sg/challenge/covid-19/stories/stronger-together/food-supply-chain-resilience-during-and-beyond-the-pandemic>
- Zelenski, J. M. (2020). *The benefits of getting close to nature*. UNESCO MGIEP. <https://mgiep.unesco.org/article/the-benefits-of-getting-close-to-nature>