



COVID-19 Lockdown Home Gardening in the Western Province of Sri Lanka

T.G.U.P. Perera^{*1}, N.C. Wickramaarachchi², H.M.L.P. Karunaratne³,
Lasika Madhawa Munasinghe⁴, Kasuni Rupasinghe⁵

Abstract

Sampling a set of households from three districts of the Western Province, this paper explored the landscape of lockdown home gardening which took place during the first wave of the COVID-19 pandemic in Sri Lanka. A structured questionnaire published online enabled collecting 939 household responses. A descriptive analysis performed using the IBM SPSS package highlights that the lockdown conditions have intensified the level of home gardening of the participants. The study validates the findings from recent studies that home gardening has no dividing line when it comes to the socio-economic character of households. Primary benefit of home gardening is of households' being in seek of good and healthy consumption, vegetables and fruits have been the most preferred crop types to grow. Application of organic fertiliser have been preferred by the majority of the households. This study supports the notion that urban land scarcity is not a limiting factor for home gardening. The paper suggests that this home gardening trend reignited during the Covid-19 lockdown needs to be supported by three means: promoting healthy lifestyles, connecting government officials with local home gardeners and local plans being supportive and appreciative of home gardening.

Keywords: Lockdown Home Gardening, COVID-19, Urban Agriculture, Gardener Engagement, Benefits, Challenges, Sri Lanka

Department of Estate Management and Valuation, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, Sri Lanka

*tgup@sjp.ac.lk

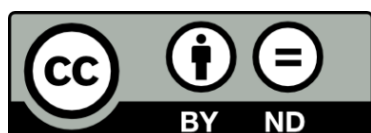
¹<https://orcid.org/0000-0002-2092-9197>

²<https://orcid.org/0000-0002-8206-1514>

³<https://orcid.org/0000-0002-6067-7203>

⁴<https://orcid.org/0000-0002-1051-6110>

⁵<https://orcid.org/0000-0002-7042-4285>



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INTRODUCTION

COVID-19 is a novel infectious respiratory disease that emerged in Wuhan, Hubei province, China, in 2019 and was caused by a class of Coronavirus, known as SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) (World Health Organization (WHO), 2020a). It has become a pandemic that is instantaneously causing an unprecedented impact on human health (Worldometer, 2021). In this scenario, countries took different measures to control the transmission of the virus by quarantining, testing and treating people, partial or complete lockdowns, social distancing, etc. (Verma and Prakash, 2020; WHO, 2020b). Sri Lanka also experienced an island-wide curfew in which the first wave lockdown took place from March to July 2020 (Department of Government Information, 2020).

The pandemic and lockdown conditions have created a vibrant movement towards promoting and implementing home gardening worldwide (see, for example, FAO, 2020; Walljasper and Polansek, 2020). Sri Lankans also started showing a heightened interest in cultivation and started growing foods, leading to the lockdown home gardening boom in Sri Lanka (Rodrigo, 2020). Further, amid this unprecedented lockdown time, knowing the benefits that can bring to society, the Sri Lankan government also promoted the public to engage in home gardening and launched several

programs in support of that. An example of this is the “Saubagya” National Program on Harvesting and Cultivation, initiated in early April 2020 to develop one million home gardens. Moreover, individuals, community groups, Non-Governmental Organisations (NGOs), private institutes promoted the home gardening concept through social media platforms (e.g., Facebook pages, YouTube channels and Television programs).

Home gardening is often considered to be an element of urban agriculture (Badami and Ramankutty, 2015; Lal, 2020) and generally promoted as a solution to food insecurity, even before COVID-19 (Galhena, 2012; Yapa, 2018). As per the 2019 statistics, 135 million people from 55 countries and territories struggle with food insecurity (Global Report on Food Crisis, 2020). COVID-19 compounds a ‘crisis within a crisis’ which leads to a severe food crisis due to the pandemic (Fan, 2020; FAO, 2020; Hossain, 2020). In this respect, lockdown home gardening became a partial or complete way of surviving the households with day-to-day food requirements with fresh and nutritious foods. Besides, that also gained them some form of income security, reducing mental stress and psychological burden, as well as a productive way of spending quality time with the family, way of getting physical exercise (Lal, 2020; Sofo and Sofo, 2020). The boom of lockdown home gardening in urban areas of Sri Lanka and its benefits for



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social wellbeing were explained in various literature (Dissanayake and Dilini, 2020; Rodrigo, 2020). However, limited attention has been given to depict the landscape of lockdown home gardening and people's engagement, particularly in the Western Province, which is the area that has been subjected to the longest lockdown, being the highly affected area in the country.

With this purview, we adapt the meaning of lockdown home gardening as a small-scale cultivation system around a family dwelling or within walking distance of a family dwelling that consists of mixed crops such as vegetables, fruits, flowers, medicinal plants, and livestock that initiate or reinstate during the period of complete lockdown due to COVID-19 pandemic (Galhena et al., 2013; Al-Mayahi et al., 2019). This research aims to study the landscape of lockdown home gardening in the Western Province of Sri Lanka, which particularly took place from March to July 2020; the first wave of the COVID-19 pandemic in Sri Lanka. Accordingly, the study focuses on the following three broad aspects: characteristics of the gardener, characteristics of lockdown home gardening, and benefits, challenges and suggestions. The study used an online survey approach. A structured questionnaire developed by Google Forms was used as the data collection instrument. Data were analysed using descriptive statistics processed by the IBM SPSS package. The rest of the

paper is organised as follows. First, it discusses the literature related to lockdown home gardening. Secondly, the paper informs about the study methods. Finally, the paper discusses the empirical results related to the three broad aspects of lockdown home gardening. This research may warrant empirical addition to the contemporary home gardening literature. In addition, the results can be used for policies related to promoting urban agriculture and sustainable resilient cities. Moreover, it provides insights to shape urban areas with respect to Sustainable Development Goal 2- zero hunger and Sustainable Development Goal 11 – Sustainable Cities and Communities.

LITERATURE REVIEW

Home gardening

Despite no universally accepted definition, the scholars commonly define home garden as a micro-environment situated close to the homestead (Nifiez, 1987; Watson and Eyzaguirre, 2002) where several species of plants are grown and maintained by the household members and their products are primarily intended to the family consumption. It can be a multi-purpose garden that comprises diversified species of crops (annual or perennial, root crops to climbers etc.,) and livestock (Watson and Eyzaguirre, 2002; Kehlenbeck and Maass, 2004; Galhena et al., 2013; Al-Mayahi et al., 2019). Home gardening is also recognised as 'homestead garden',



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'backyard garden', 'kitchen garden', 'agroforestry', 'mixed garden', etc. (Helen Keller international, 2001; Mictchell and Hanstad 2004).

Home garden is the most common form of urban agriculture around urban environments (Zasada et al., 2020). As a supplementary food source, home gardening becomes more vital when there is a distraction of access to fresh food in urban areas (Altieri and Nicholls, 2020) in conditions such as the COVID-19 pandemic. Home gardening is accepted as a means to strengthen local agricultural growth and cities to have a more resilient food system (Zasada et al., 2020). In this light, lockdown home gardening emerged as a critically important notion to strengthen local food production at the household and community levels, particularly during Covid-19 pandemic conditions (Dissanayake and Dilini, 2020; Lal, 2020; Montefrio, 2020; Rodrigo, 2020; Sofo and Sofo, 2020). This home gardening trend that emerged during the lockdown has been investigated under many aspects in different studies (e.g., Dissanayake and Dilini, 2020; Sofo and Sofo, 2020; Talidong and Toquero, 2020; Corley et al., 2021; Mullins et al., 2021). Adding more empirical evidence to such investigations, this study investigated the landscape of lockdown home gardening in the Western Province in Sri Lanka during the first wave of the pandemic by focusing on three broad aspects: (i) characteristics of home gardener, (ii) characteristics of

lockdown home gardening and benefits, (iii) challenges and suggestions of home gardening (Figure 1).

Home Gardener

Gardener here refers to the person in the household often spending more time in the garden (Gray et al., 2014). In terms of experimenting the socio-economic character of gardeners, home gardening and urban agriculture literature often discuss the contribution levels and preferential differences between men and women in the household. For instance, some scholars argued whether home gardening had become a women-centric activity in the household (e.g., Abebe and Mulu, 2017; Dissanayake and Dilini, 2020). Robertson (2013) stated that even though both men and women engage in urban agriculture for the same reasons, women receive an additional benefit of stress relief from participating in the gardens. Reyes-García et al., (2010); Taylor et al., (2016) and Philpott et al. (2020) have observed that women are more likely to cultivate ornamental and medicinal plants, whereas men are more likely to grow vegetables than ornamental crops. Moreover, it was also found that the friends and family support that gardeners receive would have a positive impact on home gardening in terms of cultivating more varieties and looking after them (Gray et al., 2014; Zasada et al., 2020). Some literature has also looked into the educational level of gardens and has discovered that those



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who are with less formal education (no more than high school) spent about twice as much on gardening compared to those with more formal education (at least some post-high school education) (Philpott et al. 2020). This articulation has changed in the current literature on COVID-19 lock down home gardening. Gardeners of lockdown home gardening have been from all employment levels, educational backgrounds, social levels and has been indifferent between men and women (see for example, Dissanayake and Dilini, 2020; Montefrio, 2020; Rodrigo, 2020; Talidong and Toquero, 2020; Walljasper and Polansek, 2020).

Characteristics of home gardening

The empirical research on home gardening reveals that lockdown has not compromised on crop varieties possible to grow in home gardening. Under lockdown conditions, households have been able to grow crop types such as vegetables, fruits, medicinal herbs, officinal plants, and spices (Sofa and Sofa, 2020; Walljasper and Polansek, 2020; Mullins et al., 2021; Rodrigo, 2020). The smart and innovative cultivation techniques that the gardeners use such as high beds, hanging boxes and buckets in small vacant areas such as balcony, terrace, and small courtyard (Al-Mayahi et al., 2019; Sofa and Sofa, 2020; Zasada et al., 2020) have helped them to cultivate a range of crops even in the land plots that are very small or apartments that do not have a land to grow. It was also notable that lockdown home gardening

mostly used organic fertilisers (Dissanayake and Dilini, 2020; Montefrio, 2020; Walljasper and Polansek, 2020; Zasada et al., 2020). Besides, the study that has been conducted in Kandy, Sri Lanka has shown that during the lockdown time, people have been sharing organic fertiliser produced in their homes among neighbours or supportive parties (Dissanayake and Dilini, 2020). By handling a large variety of crops, organic fertiliser usage, cultivation techniques and giving more environmental focus, people have created their gardens as biodiversity hubs (Zasada et al., 2020). In a similar vein, Walljasper and Polansek (2020), in their review regarding home gardening boom around the world during the pandemic, have highlighted that households have reached to neighbouring gardens to avoid crop overlaps so that they can share different crop productions. Further, it was found that lockdown home gardening outputs have made a great contribution to monthly household consumption (Mullins et al., 2021).

Benefits and Challenges of home gardening

Motivations for home gardening are strongly connected with the benefits coming through home gardening. More broadly, home gardening delivers different types of social, economic, and environmental benefits. Social benefits that home gardening can deliver are enhancing food security (Thaman, 1995; Galhena et al., 2013; Rajani and

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Joshi, 2017), improving physical and mental health (Galhena, et al., 2013; Dissanayake and Dilini, 2020; Corley et al., 2021; Mullins, et al., 2021), women empowerment (Bushamuka et al., 2005; Galhena et al., 2013) and self-satisfaction (Sofa and Sofa, 2020). From an economic point of view home gardening provides livelihood opportunities (Kehlenbeck and Maass, 2004; Mitchell and Hanstad, 2004; Galhena et al. 2013; Badami and Ramankutty, 2015; Zasada et al., 2020), savings on household's cost for food (Kehlenbeck and Maass, 2004; Sofa and Sofa, 2020), promoting local entrepreneurship and rural development (Galhena et al. 2013) and creates disposable income for other domestic needs of the household such as health and education of children (Badami and Ramankutty, 2015). The environmental or ecosystem improving benefits of home gardening are improving soil fertility in home gardens (Calvet-Mir et. al., 2012), water purification (Calvet-Mir et. al., 2012) and enhance the quality of the environment (Kehlenbeck and Maass, 2004; Buchmann, 2009; Calvet-Mir et. al., 2012; Dissanayake and Dilini, 2020). Out of many benefits, home gardening during lockdown highlighted its contribution to the improvement of the mental health of gardeners (Dissanayake and Dilini, 2020; Corley et al., 2021; Mullins et al., 2021).

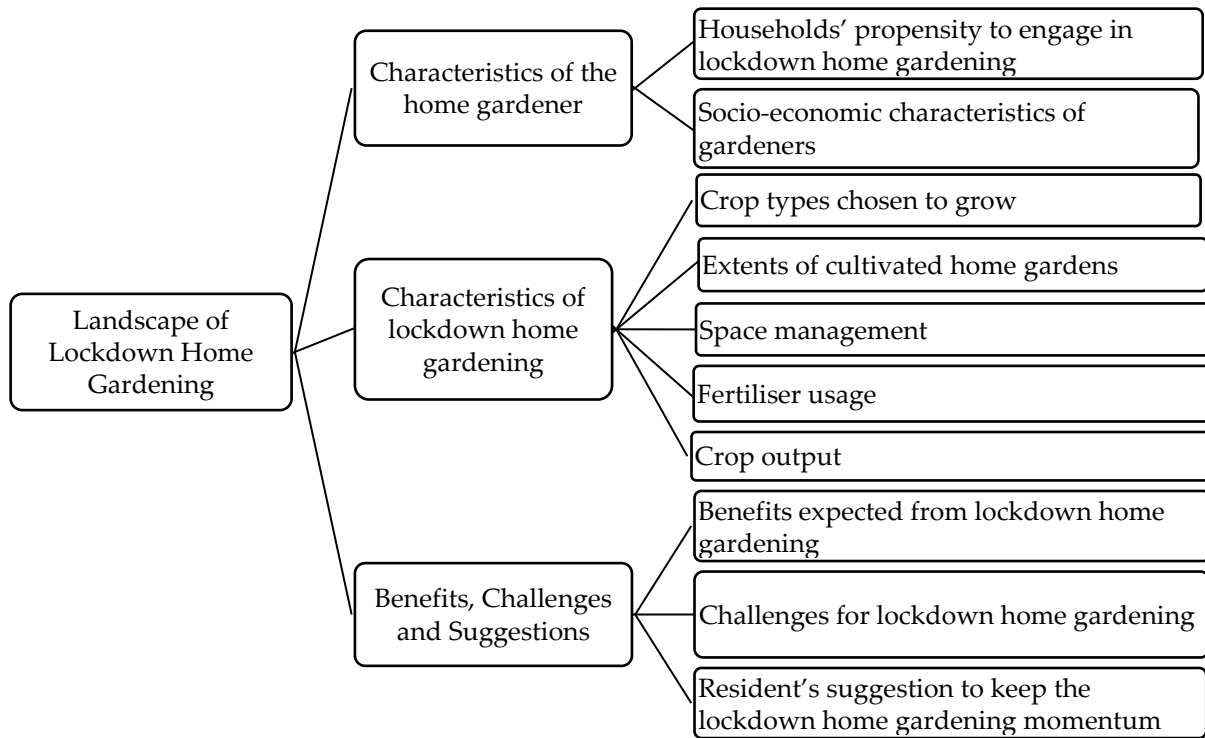
Along with such a wider range of benefits, executing home gardening also has its key challenges. Some notable challenges highlighted in the empirical studies in the context of different regions and countries such as Oman (Al-Mayahi et al., 2019), Asia (Hoogerbrugge and Fresco, 1993; Mitchell and Hanstad, 2004; Dissanayake and Dilini, 2020), Mesoamerica (Howard, 2006), South Africa (Adekunle, 2014) and Peru (Niñez, 1985) are lack of land availability for cultivation (Hoogerbrugge and Fresco, 1993; Howard, 2006; Al-Mayahi et al., 2019), limited access to agricultural inputs such as seeds, tools etc.(Adekunle, 2014), lack of knowledge (Adekunle, 2014; Al-Mayah, et al., 2019; Dissanayake and Dilini, 2020), poor soil fertility and soil erosion (Howard, 2006; Al-Mayahi, et al., 2019), difficulties in access to water (Niñez, 1985), threats from pest, diseases and theft (Niñez, 1985; Dissanayake and Dilini, 2020) and lack of opportunities to access quality livestock breeds (Mitchell and Hanstad, 2004).

According to this comprehensive literature review, this study frames the landscape of lockdown home gardening into three broad aspects and further categorised into ten sub aspects. (Figure 1).



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Figure 01. Aspects to examine in understanding the landscape of lockdown home gardening



Source: Compiled by Authors, 2021

METHODS AND MATERIAL

Study area

The study was carried out in the Western Province of Sri Lanka, which encompasses three urbanised¹ districts; Colombo, Gampaha and Kaluthara (Figure 02). The Western Province span over an extent of 368,400 hectares falls within the wet zone² of Sri Lanka. The total number of households in the Western Province is 1,482,221, i.e., 28.2 per cent of Sri Lanka's household population (Department of Census and

Statistics, 2012). Being the highest urbanised region of the country, the Western Province provides the highest contribution to GDP (39.1 per cent) (Central Bank of Sri Lanka, 2019), consisting of 9.7% agricultural sector contribution. The home garden land use of the Western Province is around 36.63% (Department of Land Use Planning Office, 2018), out of which the shares for Colombo, Gampaha and Kaluthara districts are 37.77%, 48.56% and 27.65%, respectively. During the first wave of the Covid-19, the Western

¹ Entire area of all three districts is declared as urban promotion areas by the Urban Development Authority Sri Lanka

² The average annual temperature in the province ranges from 26.0 - 27.0 °C, whilst the annual rainfall records to be 2348 - 3141 mm (Department of Meteorology, 2021)

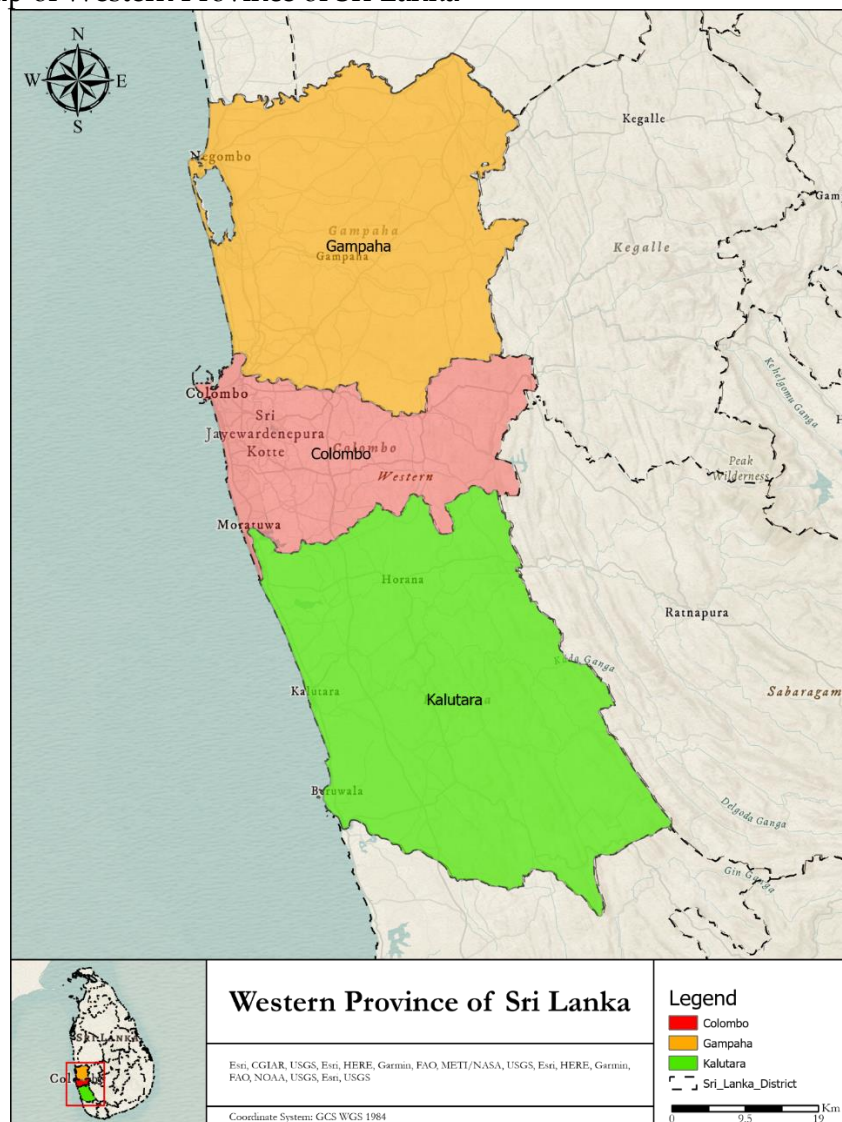


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Province underwent the longest lockdown with travel bans enforced between the period of 20th March to 11th May 2020 compared to the rest of the country, whilst the gradual normalising of daily activities went on till the end of July 2020. During such time, all households were confined to their houses with strict mobility restrictions whilst they had limited

access to goods and services (Weerahewa et al., 2020; Hettiarachchi et al., 2021). However, it is noteworthy here that such lockdown measure was enforced as a precautionary measure to control the spread of the virus³. Thus, it is fair to assume that the public in general had mental and physical stability to engage in home gardening should they be willing to do so.

Figure 02. Map of Western Province of Sri Lanka



Source: Compiled by Authors, 2021

³ There were only 73 confirmed Covid 19 cases at the time of 1st Lockdown (20th March 2020)



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Data collection and analysis

The focus of the study was to understand the home gardening landscape in the Western Province of Sri Lanka under the lockdown conditions. Accordingly, the data collection of the study adapted the online questionnaire survey with convenience sample approach, which enabled reaching the household respondents in the Western Province under lockdown conditions. Such study methods are seemingly deemed appropriate when looking into contemporary studies of similar investigations (see for example, Bidarbakhtnia, 2020; R Nair et al., 2020; Rossi et al., 2020).

The questionnaire was prepared by an extensive review of home gardening literature (Table 01) and with the consultation of a group of experts in the field. To collect data on three (03) main aspects and ten (10) sub aspects as shown in Figure 01, the questionnaire was structured into four sections. The first section consisted of filtering questions to ensure that the respondents were from the Western Province. The rest of the three sections focused on (i) respondents' background information and household propensity to engage in lockdown home gardening, (ii) characteristics of lockdown home gardening and (iii) benefits, challenges and suggestions to improve home gardening in the Western Province. The first three parts of the questionnaire and the question related to the

“benefits of home gardening” were based on Multiple Choice Questions (MCQs). The answers for them were structured based on the literature review and expert opinions. In addition, the answers included “Other (Please State)” option to capture respondents own answers that may not have been covered within the structured answers. With a view to provide better insights regarding the “challenges for home gardening” the structured answers given for MCQ used a Likert scale of three (1= challenge is not relevant, 2= challenge is relevant, and 3= challenge is highly relevant). In addition, the questionnaire included an open-ended question to receive respondents' “suggestions to improve home gardening in the Western Province”.

A pilot survey with 50 participants was conducted through email to refine the questionnaire, and slight revisions were made to the wordings and flow of questions based on the initial findings. Following the convenience sampling method, the questionnaire was open to the entire households in the Western Province who would be interested to self-report. In order to recruit the highest possible respondent rate, the questionnaire was made available in Sinhala, Tamil, and English languages and was widely published on several government websites and social media groups. The questionnaire was available online and was valid to respond from 15th May to 07th September 2020, and the total number of responses received to the



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questionnaire was 939 households: 459 were from the Colombo district, 254 were from the Gampaha district, and 226 were from the Kalutara district.

Given that the focus of the study is to explain the landscape of lockdown home gardening, descriptive statistics (processed through the IBM SPSS package) was fitted to analyse data. Accordingly, data were presented through tables and charts as appropriate. The resident’s perception on challenges for home gardening measured using the Likert Scale recorded a Cronbach Alpha (reliability value) of 0.966 (Table 02). Qualitative data collected for the open-ended question: “households’ suggestions to improve home gardening” followed a content analysis.

A key limitation of the study is that the respondents were restricted to those with internet access and digital literacy, resulting in an inherent coverage bias.

Table 01. Structure of the Questionnaire

Main Aspects	Key question area	Question type
Characteristics of the Home gardener	Household propensity to engage in lockdown home gardening	Multiple Choice
	Socio-economic characteristics of gardeners (Mullins et al., 2021, Sofo and Sofo, 2020,	Multiple Choice

	Corley et al., 2021, Talidong and Toquero, 2020, Dissanayake and Dilini, 2020)	
Characteristics of Lockdown Home gardening	Crop types chosen to grow (Dissanayake and Dilini, 2020, Sofo and Sofo, 2020; Walljasper and Polansek, 2020; Mullins et al., 2021; Rodrigo, 2020)	Multiple Choice
	Extents of cultivated home gardens (Watson and Eyzaguirre, 2002; Kehlenbeck and Maass, 2004; Galhena et al., 2013; Al-Mayahi et al., 2019)	Multiple Choice
	Space management (Dissanayake and Dilini, 2020; Sofo and Sofo, 2020; Zasada et al., 2020)	Multiple Choice
	Fertiliser usage (Dissanayake and Dilini,	Multiple Choice



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	2020; Montefrio, 2020; Walljasper and Polansek, 2020; Zasada et al., 2020)	
	Crop output	Multiple Choice
	Benefits expected from lockdown home gardening (Kehlenbeck and Maass, 2004; Buchmann, 2009; Calvet-Mir et. al., 2012; Dissanayake and Dilini, 2020)	Multiple Choice
Benefits, Challenges and suggestions	Challenges for lockdown home gardening (Hoogerbrugg e & Fresco, 1993; Soini, 2005; Sunwar et al., 2006)	Multiple Choice with Likert Scale
	Resident's suggestion to keep the lockdown home gardening momentum	Open-Ended

Source: Compiled by Authors, 2021

Table 02. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.966	.967	24

Source: Compiled by Authors, 2021

ANALYSIS

Characteristics of gardeners

Households' propensity to engage in lockdown home gardening

The 939 respondents showed (Table 3) that at least 75% of households from all three districts in the Western Province were already engaged in some level of home garden cultivation even before the area went under lockdown. At least 95% of them from all three districts were interested to continue and intensify cultivations in gardens furthermore. Only a total of 22% from all three districts in the Western Province had not been engaged in home gardening before the lockdown. Lockdown conditions seem to have driven 89% of them to enter into home gardening. Accordingly, among these 939 respondents, the new entry to the home gardening due to lockdown conditions would be 22.31% from Colombo, 19% from Gampaha and 16% from Kaluthara, amounting to 28.48% from the Western Province.



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Table 03. Likeness to engage in home gardening

Likeness for home gardening	Colombo (Percentage)	Gampaha (Percentage)	Kaluthara (Percentage)	Western Province (Percentage)
Engaged in home gardening before the lockdown				
Yes	77	81	75	78
Likeness to intensify the level of existing home gardening during the lockdown				
Yes	99	100	95	98
No	1	0	5	2
Engaged in home gardening before the lockdown				
No	23	19	25	22
Likeness to start home gardening as a result of the lockdown				
Yes	97	100	64	89
No	3	0	36	11

Source: Field survey, 2020

Socio-economic characteristics of home gardeners

As Table 04 highlights, the respondents who participated in lockdown home gardening were recorded to be 42% male and 58% female. They were also households of all ages from 16 to more than 64. The majority of the participants had one or more higher

educational qualifications. The households engaged in home gardening were also a mix in terms of their occupational backgrounds - government, private, casual, self-employed, retired or unemployed status. Many of the respondents were spending between LKR 25,000-50000/- (USD 138 – 277 equivalent) per month on food, and the size of their households was primarily 4-6 members.

Table 04. Socio-economic characteristics of the households engaged in lockdown home gardening

Socio-economic characteristics of the households engaged in lockdown home gardening	Colombo (Percentage)	Gampaha (Percentage)	Kaluthara (Percentage)	Western Province (Percentage)
Gender				
Male	45	43	35	42
Female	55	57	65	58
Age				
16-24	15	45	51	32
25-44	60	29	31	44
45-64	23	23	18	22
Over 64	2	2	0	4
Level of Education				
Higher educational qualifications (PhD, Masters, Postgraduate Diploma, Bachelors)	40	54.3	37	43.2
Diploma or certificate programs	11	15.2	7	11.0



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Higher secondary school (Advance level or equivalent)	22	20.1	47	27.5
Secondary school (Ordinary level or equivalent)	23	9.8	9	16.0
Primary School	3	0.6	0	1.9
Prefer not to say	1	0	0	0.4
Occupation				
Government/Public sector	27	17	15	21.4
Private sector	39	25	30	33
Daily wage worker	3	1	2	2.3
Self-employed	13	7	5	9.5
Retired	3	2	1	2.3
Unemployed	1	8	8	4.8
Student	13	39	38	26.3
Other (eg: independent researcher and Semi-government University)	1	0	0	0.3

Number of family members				
1 to 3	26	21	15	22.1
4 to 6	72	77	82	75.9
7 to 9	1	2	2	1.9
10 or above	0	0	1	0.1
Average monthly expenditure on food				
Less than LKR.25000	13	50	36	29
LKR.25,000-LKR.50,000	81	46	61	66
More than LKR. 50,000	6	4	3	5

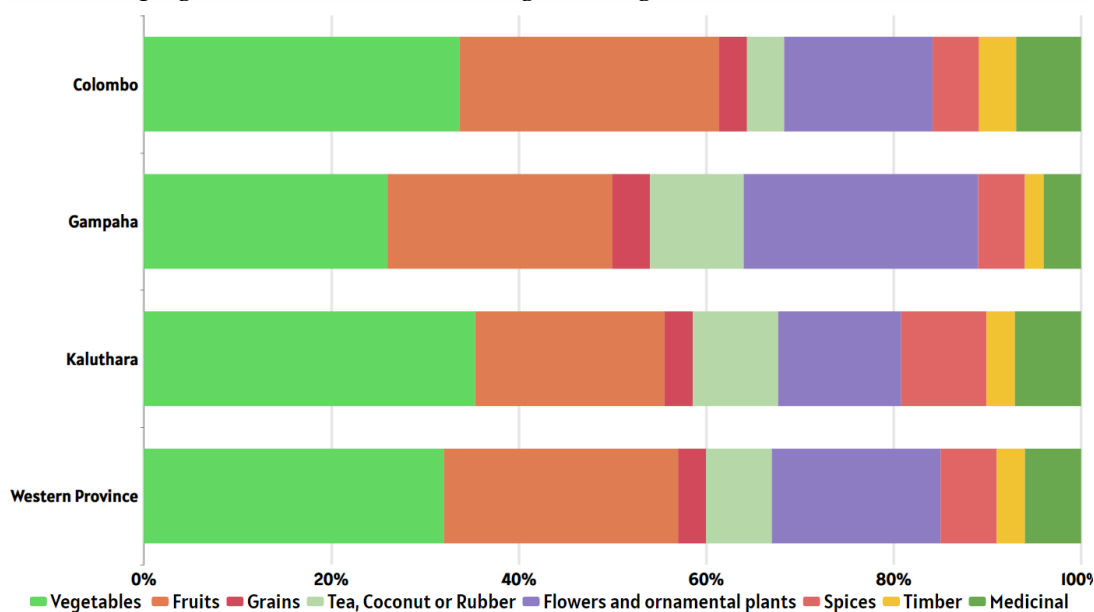
Source: Field survey, 2020

Characteristics of home gardening

Crop types chosen to grow

Figure 03 highlights the different crop types that the respondents cultivated in their home gardens during lockdown times.

Figure 03. Crops grown in lockdown home gardening



Source: Field survey, 2020



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The majority in all three districts (34% in Colombo, 26% in Gampaha and 35% in Kaluthara) have chosen to grow vegetables in their home gardens. This amounts to 32% of total respondents in the Western Province. Growing fruits is the second most popular choice ranging the percentages from 20-25% of respondents. Non-edible crops such as flowers and ornamental plants were also popular in all three districts. Respondents have also grown crops such as grains, spices, tea, coconut or rubber (at non-estate level) medicinal, and timber, but to a lesser extent.

Extents of home gardens

As indicated in Table 05, only 31.2% of respondents of the Western Province had residential lands less than ten perches, out of which the majority of them were from the Colombo district. 68.8% of respondents in the Western Province had residential lands larger than ten perches, including those of 40 perches or more. Only 3 - 4% of respondents invariably in the Western Province had stated that they have no remaining land to grow after constructing the house. 69% from Colombo, 56% from Gampaha and 55% from Kaluthara respondents had more than one-fifth of their land remains as garden area after constructing the house.

Table 05. Extents of home gardens in cultivation

Extents of home garden premises	Colombo (Percentage)	Gampaha (Percentage)	Kaluthara (Percentage)	Western Province (Percentage)
Total extent				
less than 10 P	42	25.24	15	31.2
10.1 P - 20 P	43	33.50	38	39.5
20.1 P - 30 P	7	13.59	13	10.3
30.1 P - 40 P	3	7.28	9	5.5
Above 40.1 P	5	20.39	25	13.5
Approximate percentage of land available for cultivation without built-up area				
More than 75% of total land extent	3	2	10	4
Between 51% - 75%	18	12	13	15
Between 35% - 50%	27	12	11	19
Between 21% - 34%	21	30	21	23
Between 01% - 20%	28	41	42	35
Zero vacant space to cultivate	3	3	4	4

Source: Field survey, 2020

Space Management

Residential property utilisation for home gardening in the Western Province (Figure 04) highlights those residents have used both indoor (built-up area) and outdoor garden spaces for

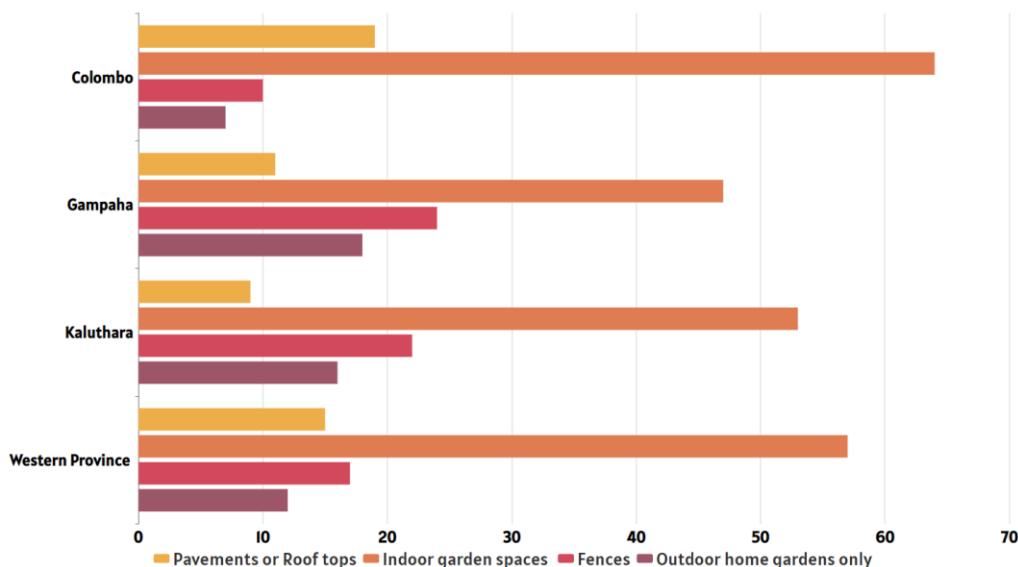


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their growing activities. 83% of respondents in the Colombo district have used some of their indoor spaces (within the perimeter of the built-up area) for growing purposes –pots and bags in balcony, pavement or rooftop areas. The same pattern was observed in the Gampaha and Kaluthara

districts. Fences as a space to grow are also used in all districts. Only 12% of respondents from Western Province (in other words, 7% from Colombo, 18% from Gampaha and 16% from Kaluthara) reported that the space utilisation for home gardening was limited to outdoor garden spaces only.

Figure 04. Cultivation spaces of home gardens



Source: Field survey, 2020

Fertiliser usage

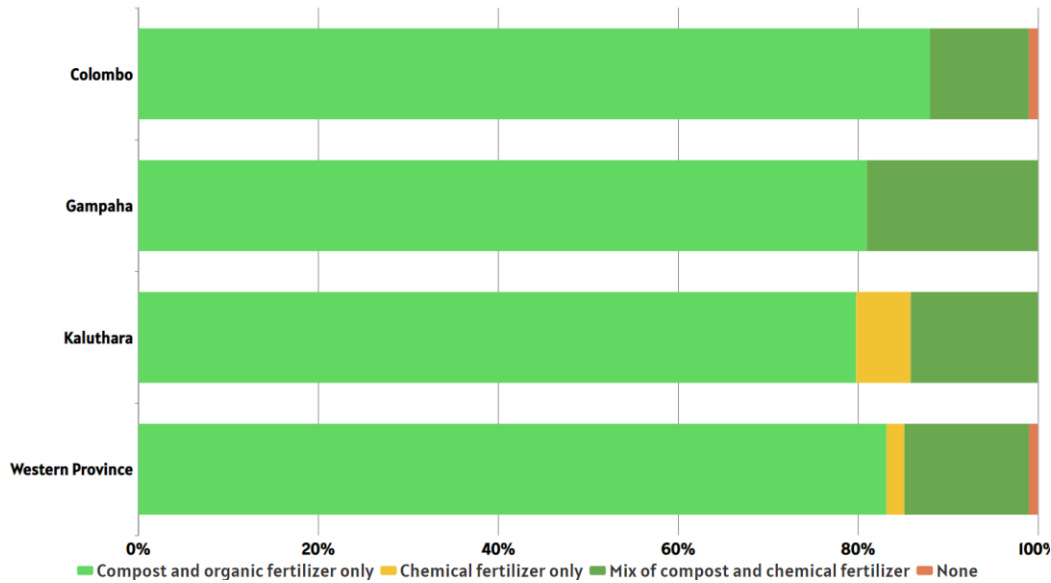
A noticeable feature according to Figure 05 is that almost all the respondents in the Western Province have been applying compost and organic fertiliser for home gardening during lockdown times. A few respondents, i.e., a total of 14% in

Western Province representing 11% from Colombo, 19% from Gampaha and 14% from Kaluthara have applied a mix of compost and chemical fertiliser. The respondents who depended solely on chemical fertiliser were very small and almost negligible compared to those who apply organic fertiliser.



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Figure 05. Application of fertiliser for home gardening



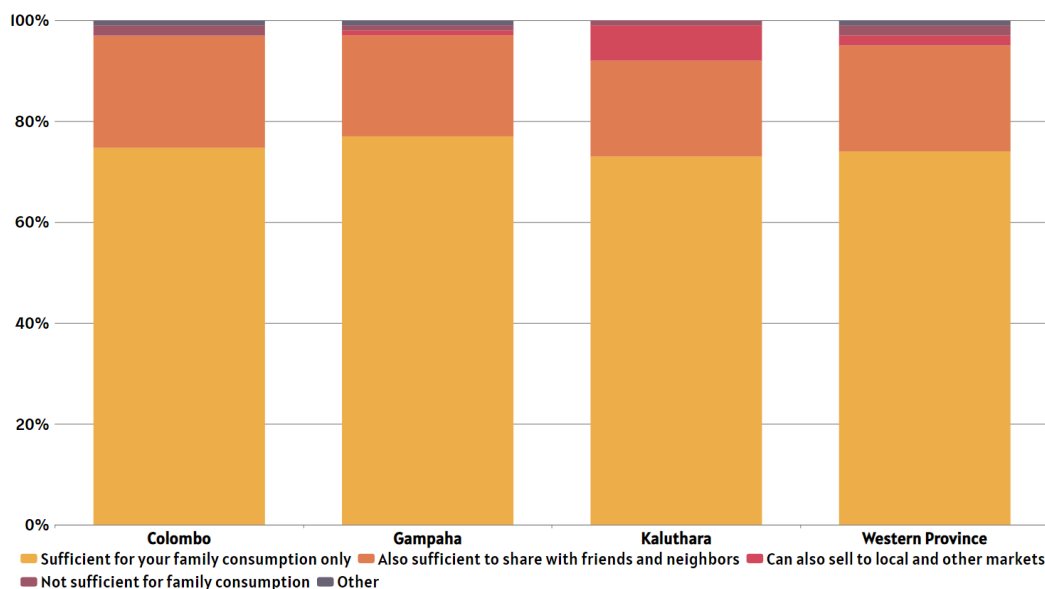
Source: Field survey, 2020

Crop output

Figure 06 highlights the approximate crop output levels that the respondents

obtained during lockdown home gardening.

Figure 06. Crop output from lockdown home gardening



Source: Field survey, 2020

Approximately, during the five months' period of cultivation (3 months' period of complete lockdown and two months' period of gradual

normalising of the Western Province), 97% of cumulative total respondents in all three districts have been able to receive crop outputs sufficiently



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supplementing their family consumption. 21% of respondents in the Western province had sufficient crop outputs even to share between friends and neighbours. This has been more or less indifferent among the three districts – 22% of respondents in Colombo, 20% of respondents in Gampaha, and 19% of respondents in Kaluthara have been sharing crops with family and neighbours. Relatively fewer number of respondents in Gampaha (1%) and Kaluthara (7%) districts have been able to receive outputs sufficient enough to sell locally. However, on average, 2% of

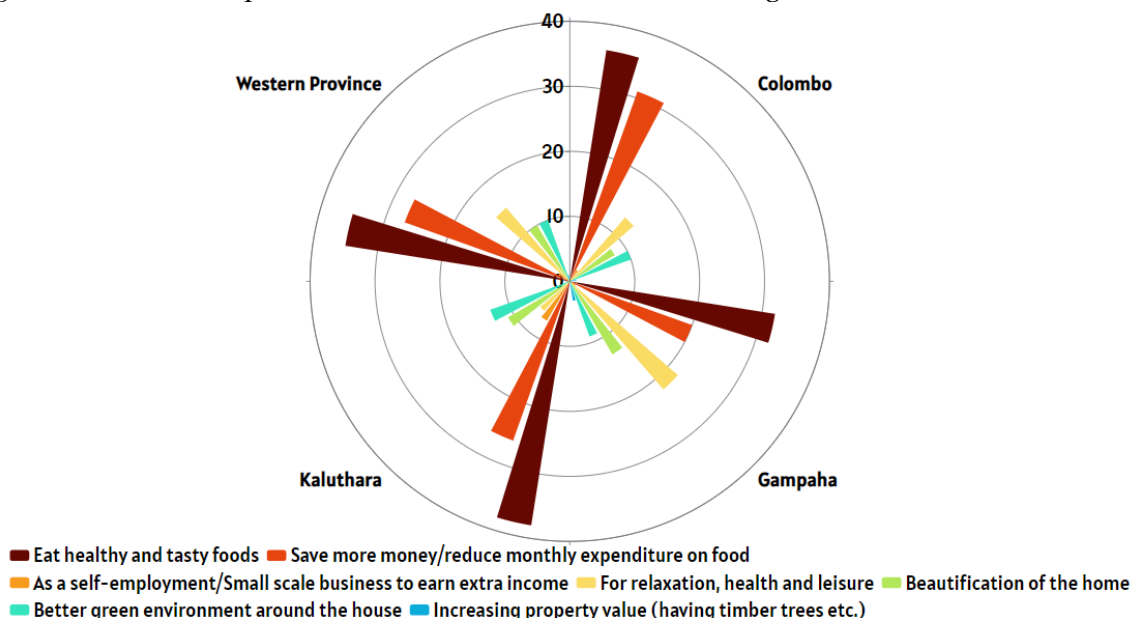
respondents in the Western Province have been unsuccessful in terms of receiving crops at least fulfilling their family needs.

Benefits, Challenges and Suggestions to improve home gardening

Benefits expected from lockdown home gardening

‘Getting access to healthy food’ was the primary response of households of all districts with respect to their anticipated benefits from lockdown home gardening (Figure 7).

Figure 07. Benefits expected from Lockdown Home Gardening



Source: Field survey, 2020

The response rate for this is 35% from the Western Province whilst this average comprises of 36% from Colombo, 32% from Gampaha and 38% from Kaluthara. The next highest benefit expected out of lockdown home gardening was to save money or reduce

monthly food expenditure. This was expected by 27% of total respondents, which comprises 31% from Colombo, 20% from Gampaha and 26% from Kaluthara. Further, 15% of total respondents thought lockdown home gardening provides leisure, relaxation,



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and stress relief activity. Around 10% of respondents believed that home gardening could be beneficial to beautify their homes and increase the green environment around their living areas. In Kaluthara District, 07% of respondents mobilised home gardening as a self-employment opportunity. Moreover, 03% of respondents in the Gampaha district expected that home gardening could increase their residential property values. On average, those who anticipate this benefit was 01% of total respondents.

Challenges for lockdown home gardening

Having the Likert scale responses, the analysis with respect to challenges that the households' faced in lockdown home gardening was performed through mean values and standard

deviations (Table 09). A mean score reported to be higher than 1.7 considered to be an indicator of perceived challenge. As far as the Western Province aggregate figures are concerned, difficulty in accessing growing materials such as plants and seeds during lockdown times, lack of knowledge, pests, diseases and threats from animals in suburban areas (e.g. rats, wild boar, porcupines, monkeys etc.), lack of top soil fertility, maintenance hassle and vandalising scored highest mean scores [higher than 1.7] with relatively lower standard deviation [less than 1.0]. A comparison of mean scores among all three districts shows that challenges are perceived to be highly critical in the Kaluthara district. Except for two factors: *land size and little sunlight*, all other challenging factors scored a mean value higher than 1.70.

Table 06. Resident's perception of challenges for home gardening

Challenges & Disadvantages	Colombo			Gampaha			Kaluthara			Western Province		
	n	Mean	Std. Dev	n	Mean	Std. Dev	n	Mean	Std. Dev	n	Mean	Std. Dev
Available land extent for cultivation is too small/inadequate	459	1.01	.749	254	1.04	.774	226	1.16	.797	939	1.06	.769
Difficult to get necessary plants/seeds to grow	459	1.88	.754	254	1.77	.713	226	2.27	.675	939	1.94	.748
Lack of knowledge/adequate information/g	459	1.88	.755	254	1.74	.642	226	2.15	.589	939	1.91	.703



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Guidance to cultivate												
Problems with pests and diseases	459	1.76	.679	254	1.86	.719	226	2.28	.651	939	1.91	.714
Problems with other (sub)urban wildlife (monkeys/porcupines/wild boar/rats etc.)	459	1.75	.737	254	1.67	.711	226	2.15	.751	939	1.82	.756
Lack of soil fertility	459	1.7	.659	254	1.57	.69	226	2.15	.663	939	1.77	.703
Hassle in maintenance of cultivation	459	1.61	.649	254	1.6	.625	226	2.15	.708	939	1.74	.697
Lack of security to the cultivation/vandalising	459	1.59	.669	254	1.58	.653	226	2.11	.694	939	1.71	.707
Lack of drainage facilities/water logging of the land	459	1.65	.742	254	1.39	.649	226	2.01	.751	939	1.67	.753
Shape of the land is not suitable for cultivation	459	1.49	.659	254	1.49	.64	226	2.06	.763	939	1.63	.722
Cost of cultivation (fertiliser, water, care taker fee etc.) is not affordable	459	1.46	.616	254	1.45	.625	226	2.08	.704	939	1.61	.694
Not enough sunlight to the home garden	459	1.5	.618	254	1.5	.652	226	1.5	.824	939	1.6	.702
Dust, fumes coming from main roads are damaging the plants/fruits	459	1.49	.618	254	1.42	.628	226	1.98	.715	939	1.59	.681
No sufficient physical strength/disability of family	459	1.42	.606	254	1.43	.617	226	1.74	.765	939	1.5	.663



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members, difficult to engage in cultivation												
Difficulty in accessing water	459	1.44	.589	254	1.36	.572	226	1.96	.742	939	1.54	.668
Infections disease risk (eg: rat fever/leptospirosis) / chemical toxicity etc.	459	1.44	.608	254	1.33	.57	226	1.99	.718	939	1.54	.676
Contaminated water table due to pollutants/waste water discharge from nearby properties	459	1.42	.598	254	1.35	.597	226	1.96	.723	939	1.53	.674
Soil contamination (eg: heavy metal contamination)	459	1.41	.566	254	1.31	.565	226	1.92	.723	939	1.51	.652

(3-point Likert Scale:1= challenge is not relevant, 2= challenge is relevant, and 3= challenge is highly relevant)

Cronbach Alpha (reliability value) of 0.966

Source: Field survey, 2020

Households' suggestion to maintain the home gardening momentum

The content analysis of the resident's suggestions to excel lock down home gardening towards home gardening of all times are shown in Table 07. Households considered addressing four main points: *promoting healthy lifestyles, innovations in home gardening techniques, effective connection between residents and government officials for local agriculture and integrated policy and practice*, which are important to make a positive influence to retain the

momentum of lockdown home gardening even under new normal conditions.

Table 07. Resident's suggestion to improve home gardening as a part of Urban Agriculture in Western Province

Theme	Example of a response
Promote healthy lifestyles	"Motivate and promote home gardening in mass media and various other means."
Effective connection between residents	"Authorities can introduce innovative methods that households can use in urban areas for home gardening."



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and government officials for local agriculture	<p><i>"Promote organic fertiliser usage and a healthy lifestyle among households"</i></p> <hr/> <p><i>"Provide households with more knowledge on home gardening"</i></p> <hr/> <p><i>"Government officials in local areas for agriculture should connect more with local households"</i></p> <hr/> <p><i>"Introduce a Mobile Application with a system to supervise advise and communicate with the house gardeners."</i></p> <hr/> <p><i>"Arranging a system to purchase the harvest by the Government or Private Sector. (Eg. Cooperative System)"</i></p>
Local planning policies in support of home gardening	<p><i>"Provide necessary technology, infrastructure, and seeds"</i></p> <hr/> <p><i>"Introduce new policies and regulations in development plans to promote Urban Agriculture"</i></p> <hr/> <p><i>"UDA can be the intermediate organisation to coordinate between house / land owner and buyers / suppliers since UDA has the databases. This can be introduced to some lands where buildings are not permitted. To encourage cultivating such lands UDA can allow a small house to be built in those lands within a 10% of land area. When there is a house people usually tends to cultivate as in a home garden."</i></p>

Source: Field survey, 2020

DISCUSSION

The study aimed at understanding the lockdown home gardening landscape in the Western Province via three broad categorisations: (i) gardener characteristics, (ii) gardening characteristics and (iii) benefits, challenges of lockdown home gardening and suggestions to get

potential for urban agriculture via lockdown home gardening.

Home gardening had been a practiced notion among the majority of the participants even before lockdown times. The lockdown has intensified that trend by adding new households into home gardening. Besides, the majority of the participants who were already in to home gardening wanted to increase their level of engagement. The households who were in complete non-welcoming of home gardening was a very little. The participants' family sizes were primarily 4-6 members spending around LKR 25,000-50000/- (USD 138 – 277 equivalent) for food per month. The study did not observe their age, education, and occupation, and gender has become a dividing line for them to engage in home gardening. These findings tally with a significant number of recent studies (e.g., Mullins et al., 2021, Sofo and Sofo, 2020, Corley et al., 2021, Talidong and Toquero, 2020, Dissanayake and Dilini, 2020).

By engaging in home gardening during lockdown times, households' primary expectations were getting access to healthy food and saving money that they would spend on purchasing food otherwise. Conform to these motives, the fertiliser application for home gardening almost was based on organic types whilst the widely grown crop types were vegetables and fruits. Up to some extent, households also recognised that home gardening during lockdown times provides them



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certain environmental benefits such as relaxation, leisure, beatification of homes and better green environment. These expectations were more or less consistent among all three districts in the Western Province and support previous work such as (Corley et al., 2021; Mullins, et al., 2021; Dissanayake and Dilini, 2020; Galhena et al., 2013; Calvet-Mir et. al., 2012; Buchmann, 2009; Kehlenbeck and Maass, 2004). There was also limited evidence that the idea of growing timber in gardens would increase property values. That home gardening products can generate extra income was also a stimulating factor for some.

Even though it was relatively to a lesser extent, participants who chose to grow flowers and ornamental plants, grains, spices, tea, coconut or rubber (at non-estate level) medicinal, and timber were in conformity with these latter motives.

Even though the Western Province is the most urbanised region in the country and the scarcity of land per se would be a fact, home gardening isn't seemingly being restricted by that. Whilst some had residential lands sufficient enough to retain spacious outdoor gardens (plots of land of 40 or 30 perches or more), residents' with smaller plots also had managed space to grow. Besides, with residential plots having open spaces around built-up area, participants have been employing space management strategies such as using vertical spaces such as fences, using pots and grow-bags to cultivate

plants in indoor areas such as pavements, rooftops etc. Under these conditioned space inputs, the participants from all three districts had managed to receive crop outputs during lockdown times sufficient enough for their own consumption and to share with friends and neighbours. A limited number of participants had also experienced farthest outcomes: have been able to earn extra income out of home gardening or no crops received even enough for family consumption.

Participants from all three districts reported that the home gardening was undertaken subject to some barriers. These were particularly overwhelming for the Kaluthara district. Some challenges, such as *difficult to get necessary plants or seeds to grow* were more lockdown bound. But other reported challenges inform that policies and initiatives that intend to support home gardening as a part of urban agriculture should pay attention to areas such as pest and disease control, gardeners provided with required knowledge, measures to retain and improve soil fertility in local neighbourhood areas and improve social values. A number of suggestions were also highlighted by participants and those more broadly are promoting healthy lifestyles, effectively connecting government officials for agriculture with local residents, local planning policies to be supportive of home gardening.



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CONCLUSION

By providing evidence from the Western Province of Sri Lanka to understand the landscape of lockdown home gardening under three main aspects: gardener; home gardening; and benefits, challenges and suggestions to improve home gardening, the paper top up the empirical sub arena of lockdown home gardening. This contributes to COVID-19 and home gardening literature in particular, and urban agriculture and sustainable communities (SDG 11) literature in general. The findings of the study is in accordance with most of the recent studies. The lockdown situation has intensified home gardening in the Western province through initiation or re-initiation of gardening activities. Home gardening has been an act of all classes having no dividing lines as far as households' socio-economic backgrounds are concerned. Primarily lead by the idea that home gardening is linked with good consumption and health, households had sufficient economically, socially and environmentally interwoven motivations to engage with it and receive reasonable level of output at least sufficient to own family consumption. The propensity to use organic fertiliser is another highlight presented by data.

The fact of land scarcity amidst urbanisation doesn't seemingly a limiting factors for home gardening in Western province. But to get acceleration of home gardening

towards urban agriculture, households perceive that what is more important to look at from policy wise would be (i) promoting healthy lifestyle to retain the re-gained home gardening trend (ii) government officials appointed locally for agriculture to connect well with the local residents to provide advocacy on gardening, dealing with pest, repelling and tackling of urban wildlife etc. (iii) local planning policies supportive of home gardening particularly on local infrastructure that support to retain soil fertility. Carrying out longitudinal studies would merit to investigate the continuation level of lockdown home gardening in the new normal scenario and gain more insights on how these lockdown trends can be harnessed to promote urban agriculture in the Western Province.

Acknowledgement

The authors would like to acknowledge the support given by the CRES (Center for Real Estate Studies), Department of Estate Management and Valuation University of Sri Jayewardenepura Sri Lanka.

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