

**CO-CREATING ANIMISTIC CARE WORLDS IN PRECARIOUS TIMES: AN
ETHNOGRAPHIC STUDY OF URBAN ROOFTOP GARDENING IN
THIRUVANANTHAPURAM CITY, KERALA**

**A thesis submitted during 2023 to the University of Hyderabad
in partial fulfillment of the award of a
Ph.D. degree in Anthropology**

by

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CERTIFICATE

This is to certify that the thesis entitled **“Co-creating Animistic Care Worlds in Precarious Times: An Ethnographic Study of Urban Rooftop Gardening in Thiruvananthapuram City, Kerala”**, submitted by **GOMATHY K N**, bearing Registration Number **17SAPH02** in partial fulfilment of the requirements for award of Doctor of Philosophy in **ANTHROPOLOGY** is a bonafide work carried out by her under my supervision and guidance.

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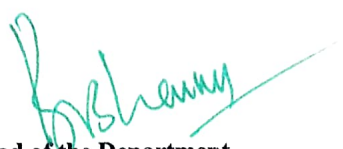
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DECLARATION

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Abbreviations

APC – Agriculture Production Commissioner

ATMA – Agriculture Technology Management Agency

CTCRI – Central Tuber Crops Research Institute

DDT – Deoxy Dichloro Trichloro Ethane

FSSAI – Food Safety and Standards Authority of India

GM – Genetically Modified

IAA – Indian Agricultural Association

ICMR – Indian Council of Medical Research

IPM – Integrated Pest Management

KAU – Kerala Agricultural University

KVK – Krishi Vigyan Kendra

NGO – Non-Governmental Organisation

NPK – Nitrogen, Phosphorus and Potassium

PVC – Poly Vinyl Chloride

PWD – Public Works Department

RAIDCO – Regional Agro Industrial Development Co-operative of Kerala Ltd

RCC – Regional Cancer Center

RKVY – Rashtriya Krishi Vikas Yojana

SHM – State Horticulture Mission

TMC – Thiruvananthapuram Municipal Corporation

UEIP – Urban Environment Improvement Programme

VAM – Vesicular Arbuscular Mycorrhiza

VAIGA – Value Addition for Income Generation in Agriculture

VFPCCK – Vegetables and Fruit Promotion Council of Kerala

Chapter 1

Introduction

The movement of the human population from one place to another and the growth of cities has a long history. However, the scale of urbanisation in the twenty-first century is unprecedented, not just in terms of the rise in the population living in urban areas, but also in the challenges it poses to the many dimensions of livability for humans and all other species on this planet. On the one hand, cities could exacerbate socio-environmental crises such as poverty, income inequality, food insecurity, waste management, and climate change. On the other hand, cities might also act as sites where alternatives to dominant forms of development and inclusive practices are experimented with. Urban agriculture is one such practice that has gathered increased attention in media and international policy circles worldwide for its potential to address many of the above crises associated with urbanisation. Besides, this practice offers several potential questions for anthropological research, such as 1) What are the particular historical and cultural contexts in which such practices emerge? 2) Who are the actors involved, and what are their perspectives? 3) What are the implications of this practice on our current understanding of the city and human-environmental relations? This study explores some of these questions by first reviewing the existing conceptualisation of cities, the relation between city and nature, and city and food, examining the history, variability, and existing scholarly approaches to urban agriculture.

1.1 Conceptualising Cities

In the 1940s, sociologists had come up with definitions of the city, the most popular being that of Louis Wirth, who defined a city “as a relatively large, dense, and permanent settlement of heterogeneous individuals” (Wirth, 1938, p. 1). Anthropologists entered later, thanks to the studies of many rural societies urbanising in the 1930s, which paved the way for a sub-field of urban anthropology by the 1960s. Those associated with the Chicago school, such as Redfield and Singer, examined the role of cities in cultural development and change, and laid down frameworks for understanding the same. They offered temporal and typological schemes to study cities. In the temporal scheme, they suggested that one may undertake a long-term perspective (in which cities are associated with the arrival of the civilisational stage in the

progress of human history), short-term frame (in which one picks a single city to examine its relation to its immediate surroundings) and lastly a middle term frame that moves beyond a particular city to examine entire nature of the urbanisation of a specific civilisation and its culture (Redfield & Singer, 1954). In the typological scheme, they classified cities into four types as follows, “1) Administrative-cultural cities in the pre-industrial period, 2) Cities of native commerce (also pre-modern), 3) Post-industrial modern metropolis across the world characterised by business class, and 4) cities of modern administration” (Redfield & Singer, 1954, p. 57). They argued that the basis of this typology is the cultural roles, orthogenetic (new forms emerge out of and in consonance with existing traditional systems from within) and heterogenetic (change is driven by elements from outside which conflict with old ways and beliefs), that a city plays. “In both these roles, a city is a place in which cultural change takes place” (Redfield & Singer, 1954, p. 58). Thus, we have a place-based understanding of cities as centres of cultural change effectuated from inside or outside. Further, in examining the relationship between the city and the countryside, they declare, “the city is a ‘service station’ and amusement center for the country, and the country is a ‘food basket’ for the city” (Redfield & Singer, 1954, p. 69). Hence, among other things, the dependence on rural areas for food was one of the defining features of cities in these early studies.

Sanjek (1990) notes that until the 1980s, the main themes of urban anthropology were urban poverty, notably “culture of poverty” (Lewis, 1966, p. 19), peasant life in cities, life in urban residential neighbourhoods, and studies on ethnicity and violence. These ethnographic studies, with their focus on communities and relationships, brought forth networking, cohesion, and kinship among the city folks, thereby empirically challenging the sociological definition of the city as a collection of disconnected individuals and anonymity. However, there was a neglect of the middle and upper classes or people in power. Moreover, works on women, sexuality, relations at workspaces, elderly were scanty, as were topics such as religion, health, and popular culture in the cities (Sanjek, 1990).

The above shortcomings were slowly getting addressed in the 1980s, as anthropologists began “studying up”, argues Sanjek (1990), who reviewed the work done in urban anthropology worldwide in the later part of the twentieth century. In the case of the USA, he notes that studies of the white middle class, working women, elderly, African- Americans, and immigrants proliferated. In contrast, in Latin America and the Caribbean, studies of women workers in factories, plantation workers, and religious and local political life were explored using Marxian and political economy approaches. In the case of Europe, under the influence of Manchester School in Britain, workplace crime and middle-class music were brought forth. In Africa, the

1980s was a prolific time for studies on religion, politics, ethnicity, and gender. For instance, in South Asia, the themes of class, gender, religion, and caste got converged, in the studies of Indian city of Madras. Therefore, through Sanjek's lens, we see that the scope of urban anthropology got widened. However, his review falls short of examining the theoretical implications of these new ethnographies for the discipline of urban anthropology.

Preliminary attempts at developing a theoretical and methodological framework for urban anthropology came from Ulf Hannerz. In his book *Exploring the City: Inquiries Toward an Urban Anthropology* (1980), Hannerz explored the usefulness of network analysis to understand the city as a whole, "a network of networks" (Hannerz, 1980, p. 202), the density and fluidity of which depends on roles people take up as they navigate through different situations in their urban life. Thus, Hannerz (1980) used roles, networks, and relations as analytical concepts to understand urban life. Nevertheless, he did not use these to delineate how urban networks differed from non-urban networks. Besides, although he emphasised relations rather than individuals, he more or less approached the city as a totality (world of many worlds), which does not differ much from the ecological approach of the Chicago school. This approach was criticised later by anthropologists such as Low and Howe. For instance, about Chicago ethnographies, Howe (1990) states, "these ethnographies were therefore studies of communities in the city, not studies of city-wide process" (Howe, 1990, p. 41).

As studies in anthropology and other disciplines reflected the diverse experience of the post-industrial and post-modern age, Setha M Low (1996) raised the need for new kinds of theorising in urban anthropology. According to her, "The city as a site of everyday practice provides valuable insights into the linkages of macro processes with the texture and fabric of human experience" (Low, 1996, p. 384). Thus, she examined urban ethnographies of the late twentieth century through the lens of knowledge, space, time, and gender. She suggested that cities can be imagined as ethnic, gendered, contested, de-industrialised, modernist, post-modernist, sacred, informational, global cities, and so on. In urban anthropology, this led to "the spatial turn" (Jaffe & Koning, 2015, p. 24). Many anthropologists contributed to this turn. For instance, a study of Spanish Americans in the marketplace versus at a plaza revealed how spaces (material reality) shape multiple and often contradictory cultural expressions (social reality) (Richardson, 1982). Another study examined how culture (socially held ideas of gender) influences the organisation of domestic spaces (Bourdieu, 2003). The spatial turn was influenced by sociological and philosophical theories of space as a social product and right to the city (Lefebvre, 1991; 1996) and the linkages between space and power in the case of urban

planning (Foucault, 1977). These led to a view of the city as a space that people in power (architects, planners, and governments) imagine and construct.

Given the age of neoliberalism, and globalisation, in the twenty-first century, cities are becoming essential nodes in global networks (Jaffe & Koning, 2015). Consequently, new trends in urban anthropology include the study of social movements, consumptive practices of the new middle class, built environment, urban inequality, solidarity, mobility, infrastructure, and communication technology (Jaffe & Koning, 2015). Further, this has led scholars, mainly from urban geography, to call for a processual understanding of the city as a political process (Davidson & Iveson, 2015), an assemblage of people, things, and technology (Brenner et al., 2011; McFarlane, 2011) or as a process in which nature is urbanised (Swyngedouw, 1996).

As Maller puts it, “Cities are... conceptualised as discrete entities, often seen to subsist self-sufficiently and autonomously, when in fact they are nodes of intense, interconnected events and the nexus of vast flows of activity, bodies and things from everywhere” (Maller, 2018, p. 41).

Hence, concepts of the city have progressed from the grand typologies of the 1960s to constructed spaces and processes. Moreover, following the processual turn, lately, there have been calls to view cities as more-than-human (Maller, 2018; Steele et al., 2019), given that cities have not only displaced ‘wildlife’ and ‘natural habitats’ in the course of their expansion, but cities are also places which already host non-human beings in complex ways. This calls for a less than anthropocentric way of looking at cities and a greater understanding of the linkages between nature and the city.

1.2 City and Nature

The relationship between nature and culture has vexed anthropology since the period of evolutionists such as E. B. Tylor, who coined the term animism as a feature of ‘primitive’ cultures that did not follow the separation of natural and cultural worlds (Hastrup, 2013). In addition, nature often appeared in anthropological descriptions of folk myths, rituals, subsistence activities, and cultural ecologists’ works. Within the sub-field of ecological anthropology, evolutionary, functionalist, and processual understanding of human-environment relations have dominated till the 1980s (Orlove, 1980). Nevertheless, closeness to nature was a defining aspect of traditional societies, whereas modernity was defined by its progressive distance from nature (Orr et al., 2015). Rotenberg (2014) notes two features that set city life apart from nature; the lack of agricultural activities and the predominance of congestion,

sickness, and concentration of built structures. For instance, while non-urban communities involved in food-growing and gathering activities cannot distance themselves from nature, urbanites can imagine a life apart from nature. Besides, while the city symbolised crowding and illness, the distant nature of the countryside represented wellness and vastness. However, Rotenberg (2014) adds that, despite the urban appearance as a human-fashioned landscape, nature overtly and covertly accompanies the human on every walk in the city. He lists that 'nature' occurs in many forms in the city. For example, nature is explicit as it self-propagates in patches; implicit when it adapts to and invades urban-built structures such as sewers, cracks in the concrete, or pipelines; ritualised during funeral ceremonies at the cemetery or celebrations in urban institutions on various occasions; nature in the form of urban parks, stray animals, ants and so on is agentic when it moves people to act for or against them; and nature is structural at the time of ideological and social movements debating the best means to design urban habitats (Rotenberg, 2014).

While Rotenberg's list helps provide a general view of how nature is ever-present in the city, it does not consider the historical, global, and local cultural context that influences and modifies human engagement with nature in different cities. For instance, the problems of waste management and pollution problems are common in many cities, but each deals with them differently. Likewise, the seemingly ubiquitous phenomenon of afforestation in cities has a different history. Therefore, scholars working on urban environmental issues call for examining cultural aspects of dealing with urban problems. For example, the conception of dirt as a social construct rather than an objective, universal category (Douglas, 1966) remains a classical anthropological contribution to studying pollution (Durr & Jaffe, 2014). Using a multidisciplinary perspective, Durr & Jaffe (2014) examined the politics of urban pollution in two cities in Mexico and Jamaica. The study revealed that polluted 'nature', in its material forms such as garbage, sewage and air pollution, enables symbolic dirt labelling of behaviours of certain people and places in the social hierarchy, thereby re-creating social and spatial discrimination in the city. Further, while global narratives of recycling in Mexico reduce the stigma associated with waste management, in Jamaica, the popular discourse works to the detriment of poorer city residents. Thus, urban pollution enables the social creation of urban space and brings together the material (nature), social, local issues and global environmental discourse into different kinds of political assemblages.

Another way nature and the city unite is through urban greening, which has become part of the urban governance agenda in many cities. Here too, the social imagination of nature plays an important role. A sociological study of the case of urban greening in the German city of Ruhr

by Hillary Angelo brought this out. In contrast to the popular conception of such practices as an ideological or local response against harmful effects of cities, such as density, pollution and disease, Angelo (2019) argues that Ruhr underwent greening for over hundred and fifty years without the features or experiences of a conventional industrialised city. It was an urbanising countryside, to which ideas and imaginations of nature as a moral good travelled and materialised into the city's greening practice. She concludes that as nature becomes urbanised everywhere, it has the potential to become a collective moral category useful for social action elsewhere. Her study is significant in that it examines the social conditions in which green becomes good in the first place, which then translates into practices such as greening. Thus, Angelo urges to redefine cities as “socio-natural” (Angelo, 2019, p. 648), questioning the neat divisions between social and natural as separate entities.

Urbanisation has progressed at different rates across the globe. Unlike the cities of the global north, whose growth has stabilised since the last century, in Asia, urbanisation has been rapid and uneven (Hwang, 2015). This has resulted in socio-ecological changes at multiple scales, which demands a new analytical framework. Rademacher and Sivaramakrishnan (2017) introduced ‘Urban ecologies’ as a multi-scalar framework that may explain the intersections of nature and the city in the urbanisation of Asia. According to them, “urban ecologies approach demands attention to the biogeochemical processes and histories that, like human social relations, form the context for understanding nature as made and afforded meaning in specific places” (Rademacher & Sivaramakrishnan, 2017, p. 4). They suggest looking at Asian cities not as a governance category (territorially bound demographic whole) but in terms of processes, which span across localities and bring multiple actors, both human and non-human. Hence, “urban ecologies” is undoubtedly a processual framework. Some notable works contributing to this frame come from Acciavatti (2017), Gold (2017) and Elinoff (2017).

Acciavatti (2017) studied the underground rural-urban tube-well network in the Ganga - Yamuna basin and pointed out how on the surface level, urban growth is driven by access to water. Still, the actual spatial spread and concentration of city homes and commercial buildings were driven by the underground tube-well network (Acciavatti, 2017). Likewise, Gold (2017) explored the differential treatment of two elements of nature (river and forest) in the multi-religious, commercial town of Jahazpur in Western India. While both elements were impacted by urbanisation, the forest was individually sacred to each religious community; therefore, each put effort into conserving it in their own way. On the other hand, the river was not deified or identified by people as their own. Instead, it was treated as a common property of the town. Thus, efforts to clean the polluted river were often inconsistent and considered the

responsibility of municipal authorities. In her words, “The desire to have a visible emblem of immediate community, whether it is a sacred grove or a new temple or mosque, appears to be more powerful than the sense of value in a natural resource as a common good that is not linked to any particular group” (Gold, 2017, p. 203). Thus, while there was a sense of pride among the people associated with forest conservation, the same was lacking in the case of the river. Gold (2017) therefore, uses the term “discrepant ecologies” (Gold, 2017, p. 185) to describe human-environment relations in the context of urbanisation in the western Indian town of Jahazpur.

Elinoff’s study brings the case of the dynamism of nature in East Asian urbanisation. He uses the term “ecologies of possibility” (Elinoff, 2017, p. 162) to describe how urban infrastructure, such as the railway track in the town of Khon Kaen in Thailand, created new forms of ecology by changing the landscapes, which entailed a politics of housing. He points out that, although the word ecology derives from the distinction between *oikos* (home/household) and *polity*, ecology and politics are intertwined, as the case of the housing struggle of the town’s inhabitants reveals. Although the state envisions alternate uses for the land, the railway tracks signify a complicated ecology that offers hope for the town’s poor migrants. “Through this lens, urban ecologies themselves no longer seem self-evident. Instead, the city, like the homes that line the tracks, becomes its own sort of dwelling space, always under laced with uncertainty and possibility, always under construction, always being remade.” (Elinoff, 2017, p. 181). Thus, in the case of Asia, multiple ecologies of urbanism have emerged, such as discrepant ecologies (Gold, 2017) or ecologies of possibility (Elinoff, 2017).

All three cases mentioned above prove the inseparability of nature from the city and question the boundary between natural and social. Further, by emphasising the role of biophysical actors, such as forests, rivers, and below-the-ground hydrological systems, or built infrastructure, such as rail tracks, these studies give a processual and a more-than-human understanding of the politics of urban pollution, the density of settlements, dwelling, and conservation. However, beyond the visible problems of pollution and settlements, urban environments are also food environments. Nevertheless, “the food system has been largely “invisible” to non-agricultural, and non-rural agency professionals and stakeholders” (Forster & Escudero, 2014, p. 11). Besides, the rising problems of urban food insecurity and safety demand closer attention to the link between city and food.

1.3 City and Food

Food is individual and, at the same time, social. It has symbolic value, for instance, signifying the unity of a household (Counihan, 1999) political and economic value (Mintz, 1986) and is a maker of collective memory (Sutton, 2001). Examining anthropological work on food since the 1980s, Mintz and Du Bois (2002) note that studies abound on food insecurity, food and ritual, identity, and social change. Ethnographies on food insecurity prioritise African cities. For instance, Guyer (1987) used the concept of social history to study food systems in four African cities. Besides, anthropologists have identified “peoples on the move- migrants, refugees, and colonisers-as agents of dietary change” (Mintz & Du Bois, 2002, p. 105). Despite earlier conceptions of the city as feeding on food from the countryside (Redfield & Singer, 1954), today, cities worldwide face multiple food-related problems. For instance, in many countries of the Global South, rural areas are experiencing a mass exodus of the population to urban areas in search of livelihood. According to McMichael (2009), this has to do with the free trade and structural adjustment policies of the countries and institutions in the global north, which have kept food prices low through the global food supply and dumping to maintain a steady supply of cheap labour. This, in turn, has affected small farmers in the countries of the global south who flock to cities to join industrial labour (McMichael, 2009). The reduction of agricultural labour in rural areas and the consequent rise of non-agricultural labour in the cities has brought forth the question of feeding the growing population in cities. Alongside, there are rising movements for local food production and consumption in cities, motivated by various reasons other than food insecurity, such as environmental and health consciousness.

In either case, this has brought scholarly attention to the processes by which cities provide food for their residents. Nonini (2014) suggests the provisioning approach (Narotzki, 2005 as cited in Nonini, 2014) as a way forward to understand how cities feed their population. This approach focuses on three features: the material pathways through which food moves and changes, social relationships that emerge within those pathways, and meanings associated with food. Further, Nonini (2014) suggests that the theoretical frame to make sense of urban food provisioning can draw from 1) a political economy perspective (Mintz, 1986), to understand linkages at the macroscale and 2) cultural perspectives that focus on changing meanings of food (Appadurai, 1981), to understand micro-level processes. Since food provisioning covers various aspects such as production, distribution, consumption and exchange, which operate at various levels, it is challenging to incorporate them all under a single study. Hence Nonini (2014) outlines four major approaches urban ethnographers tend to employ depending on which aspect of

provisioning they choose. First is a focus on food and identity. Those focusing on food preparation and consumption have examined the relationship between food and the identity of urban residents (Holtzman, 2006; Wilk, 2006). Second is the ‘nodal approach’, where anthropologists identify a city or town as an important node in the provisioning network. Bestor (2004) studied a wholesale fish market in Tokyo City in this manner. A third approach is to follow a particular food and trace the food chain, employing multi-sited ethnography. The last approach is the historical approach that seeks to outline broad processes beyond the regional level (Nonini, 2014). An example is the study of transcontinental food exports and advertising mechanisms used by British traders to sell these goods (Wilk, 2009, cited in Nonini, 2014).

We see that these early scholars have focused largely on the ways in which food provisioning happens in the urban areas. However, they have not examined the place of food in urban policy making. Understanding that food is often excluded in city planning and design, scholars have called for tracing foodscapes to build sustainable cities. For instance, Parham (2015) begins with private spaces such as kitchen and dining tables, and moves outward to gardens, street food networks, local markets, peri-urban spaces and global markets.

The above scholars have fore-grounded how the ethnographers have explored food pathways in the city. In doing so, they have identified multiple spaces (kitchens, gardens, markets) and stages (production, consumption, and exchange). However, eating is also a communicative act. Linguistic anthropologists examining the link between food and language have identified spaces beyond kitchen and dining spaces, such as classrooms and conference rooms, where conversations around food perpetuate dominant ideologies (Cavanaugh et al., 2014). For example, in her study of lunchtime conversations in a multi-ethnic, multi-lingual urban primary school in Denmark, Karrebæk (2012) pointed out how the seemingly objective category of ‘healthy food’ propagated by the school authorities went against the understandings of children and parents who belonged to the minority background. Traditional Danish foods, such as bread, were considered superior, while other foods these children brought daily were branded unhealthy (Karrebæk, 2012). The study is significant as it brings forth communication around food in specific urban settings that do not recognise or respect diversity but instead enforce cultural homogeneity. Although many studies have reported how migration entails dietary changes, Karrebæk’s study details the role of language (food communication) in the process. It also makes visible the unnoticed sites such as classrooms where these occur.

Hence, the relationship between the city and food can be looked at through various means ranging from how food provisioning occurs to how it is communicated. Besides, social movements for food justice are the most visible means of articulating connections between

food and the city. In 2008, following a rise in global food prices, the world witnessed food riots in many cities (McMichael, 2009; Morgan, 2015). In the case of the countries of the global north, such as the United States, the food justice movement gave rise to many solutions ranging from reformist measures such as ensuring food security to overhauling the food system following a call for food sovereignty (Holt-Giménez & Wang, 2011). While food security is about the physical and economic access to food at all times, sovereignty is about the right to culturally appropriate and ecologically sustainable food. Hence, sovereignty is a bottom-up and counter-approach to food security and has scope for anthropological enquiry (McRae, 2016). These movements have moved scholarly debates beyond understanding how a city is fed to moral and ethical questions regarding the sustainability of current modes of urban food provisioning. Answers to such debates take us to informal, inclusive and sustainable alternatives to the dominant food production and use modes. “A flurry of research activity in anthropology has focused on urban horticulture and agriculture, as well as “farmers” markets and more informal economic uses of nature in the city (Rotenberg, 2014, p. 392). Since the beginning of this century, Urban agriculture has been formally recognised among the solutions for building resilient and sustainable cities by international agencies such as the United Nations¹. This demands a closer understanding of urban agriculture's history, definition, and various forms as prevalent today.

1.4 Urban Agriculture

Although urban agriculture has achieved renewed attention since the early decades of this century, it is neither a new phenomenon nor uniform worldwide. During periods of urban food crises, following the enclosure movement of the 19th century and the second world war in the following century, allotment gardens grew in large numbers across European countries such as Britain and Germany (Barthel et al., 2015; Nonini, 2014). Besides, in many cities of the global South, as of 2001, approximately 800 million people continue to perform urban agriculture, growing close to a quarter of the globe's food (Smit et al., 2001).

Urban Agriculture broadly means agricultural and gardening activities (vegetable production, livestock rearing, aquaculture and flower and ornamental gardens) in urban and peri-urban areas (Slater, 2001). Many scholars agree that it is not its urban location that distinguishes urban agriculture from rural agriculture, but it is embedded in and interacts with the urban ecosystem

¹ See the 2001 UNDP report chapter 2, titled “Urban Agriculture: Food, jobs, and sustainable cities”, for more details.

(Richter et al., 1995 in Mougeout, 2000; Slater, 2001). Mougeout (2000) goes a step further to emphasise that:

UA is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area. (p. 2)

However, the above definition fails to distinguish various modes of the practice. Urban agriculture can include subsistence farming in a city, urban allotments, urban organic horticulture, high-intensity vertical farming, urban food clusters, or ‘agro parks’ (Schmutz, 2017). In the wake of agroecological and political movements, urban agroecology has emerged. Thus, according to Schmutz, urban agriculture can be considered a continuum in which organic urban agriculture (OUA) sits between urban agriculture (UA) and urban agroecology (UA+), depending on how organic is understood.

1.4.1 Rooftop Urban Gardening

Since the last decade, there has been a rise in urban farming practices in and around urban-built structures. Some scholars view rooftop gardening as part of zero-acreage farming, also known as Z-farming, which includes open rooftops, green rooftops and indoor farms (c.f. Thomaier et al., 2015). “Z-Farming can be understood as a subtype of urban farming that complements ground-based forms but implies specific technical restraints, regulatory frameworks and opportunities for resource-efficiency based on synergies between buildings and farming” (Thomaier et al., 2015, p. 44). In their survey of 73 z-farming practices across the world, the authors found rooftop gardens constituted 64% of z-farm types. Further, they found that this practice mainly used organic waste as fertilisers, enabled efficient water and energy use, and created value beyond food. However, this study included z-farms predominantly from developed cities in North America and Europe (63) and a few upper-middle-income Asian cities such as Tokyo and Hong Kong. Another study examined the viability of rooftop gardening in large public housing estates in Singapore as “building-integrated agriculture” (Astee & Kishnani, 2010, p. 105). This study projected benefits in terms of the rise in the percentage of domestic vegetable production and the reduction in carbon footprint. Thus, apart from a

worldwide survey of such farms and quantitative predictive studies, qualitative studies examining these practices in context are very scarce. Second, given the diverse nature of urbanisation in South Asia, with a lack of open spaces due to rapid expansion in built-up areas and rising lower-middle-income groups, the potential of rooftop gardens as a practice of urban agriculture must be explored ethnographically.

1.4.2 The Global North-South Debate

In scholarly and policy reports on urban agriculture, there is a clear north-south divide regarding the objectives and approaches to urban agriculture. In the global north, the discourse takes the form of ‘community gardens’ driven by a desire to reclaim and re-green the city, and concerns with eating unhealthy, ‘unsafe’ food. In contrast, in the global south, Urban Agriculture is linked to poverty alleviation, food security, and social inclusion (of women and urban poor) as part of development (Frazier, 2018). For instance, many qualitative studies exploring the perceived benefits of urban food gardening in cities like Scotland, and Italy in Europe; Chicago, Maryland, and New York in the USA, report “food empowerment” (Taylor, 2018, p. 12) in the sense of knowing the source of food and exercising control over its supply, environmental protection, social cohesion, converting criminal spaces to a safe neighbourhood, and therapeutic effect (Ferrini, 2003; Poulsen et al., 2014; Sokolovsky, 2011). Taylor notes, “Food security was identified as a potential benefit for others but was not cited as a major motivator or concern for the interviewees (gardeners) themselves” (Taylor, 2018, p. 14). Taylor’s research participants expressed scepticism about the quality and source of conventional sources of food supply. Likewise, another study was conducted by Migliore et al. (2019) on motivations driving community gardening in Palermo, Italy. It found that most gardeners were middle-class with lesser financial capital but more cultural capital. Further, the need to eat safe food was a key driver for these people, who could not afford high-cost organic foods free from industrial chemicals; besides decreased stress, increased physical activity and contribution to urban environmental greening were other factors (Migliore et al., 2019). According to Barthel et al. (2015), in the twentieth century, the food supply in the city has become even more precarious because of the huge dependency on global markets for the food supply. Besides, modern transport and communication technologies have squeezed space and time (Harvey, (1990); cited in Barthel et al., 2015). Therefore, Barthel et al. (2015) view urban agriculture as a resilience tool to deal with sudden food supply shocks. Consequently, they moot urban allotted gardens for their potential to create new green spaces and recover from the

loss of collective memory of growing food. Through these studies, urban food gardening in the global north emerges as an act of resilience (Barthel et al., 2015), “civic ecology” (Sokolovsky, 2011, p. 6) and resistance to the global industrial food system (Migliore et al., 2019; Taylor, 2018).

On the other hand, in the case of developing countries, the academic and policy discourse mainly targets the urban poor. Studies on urban food insecurity concentrate on the African continent. Some have raised the need to legalise urban agricultural practices in countries like Africa. For instance, Bryld (2003) states that it happens mostly on public lands and spaces not owned by the growers themselves; it is primarily viewed as illegal, not contributing much to the urban economy and often a public nuisance and residual aspect of a rural lifestyle. Besides, there are issues of competing land use, insecurity of tenure, gatekeeping by older inhabitants, poor cultivation techniques, uncertain yield, loss from theft and so on (Bryld, 2003). Hence, he suggests the need for a legalisation, as done by countries like Zambia and Uganda, and institutionalisation of the practice by involving all stakeholders, both planners and urban agriculturists. Others point out the need for innovative techniques. The problems of land and water constraints, especially in many developing countries, demand new ways of growing food in the cities. In light of these competing uses for resources, scholars examining the potential of urban agriculture in developing countries have suggested innovative techniques such as treating urban wastewater, rainwater harvesting and growing using hydroponics, aeroponics (cultivating aurally, keeping roots moist occasionally), and vertical farming (Koscica, 2014). However, as mentioned in the previous section, cases of innovative urban agricultural practices (such as z-farming) in the global south are yet to be explored. A report in 2008 by the Food and Agricultural Organisation (FAO) stated that by 2020, seventy-five per cent of the population in the developing countries of Africa, Asia, and Latin America, will be urbanised, of which more than eighty percent will be poor in Latin America and close to half in African and Asian cities. As a result, these countries will struggle to create jobs for the urban poor, urban waste management, and maintain environmental quality. Urban agriculture provides a complementary strategy to reduce urban poverty and food insecurity and enhance urban environmental management (Food and Agricultural Organisation, 2008). This discourse is problematic for three main concerns. First, food insecurity is prevalent in the countries of the global north too. For instance, one-sixth of the United States population is food insecure in terms of suffering from poor diet and rising health costs, fractured along the lines of class and race (Holt-Giménez & Wang, 2011). It demands exploring the potential of urban agriculture

to deal with food security in the regions of the global north. Second, a too-narrow focus on the poor overlooks the interlinkages between poor and upper-income groups (Mbiba, 2001). Third, as Te Lintelo et al. (2002) note, much of the evidence on urban farming has been gathered from African, Latin American, Caribbean and some Asian and Eastern European countries. The Indian subcontinent has been underrepresented, reflecting a neglect of this issue by the international and national research communities. Indeed, in India, government policies, scientific research communities and non-governmental organisations (NGOs) have shown little recognition of urban and peri-urban agriculture (Te Lintelo et al., 2002). This calls for examining the scenario of urban agriculture in Indian cities.

1.4.3 Debates on Organisation

The process of urbanisation, and the consequent demands placed on resources, markets and people involved in agriculture, have impacted the social, economic, and cultural dynamics of the traditional cooperative structure. Agrawal (2001) identifies the conditions for successful collective action outcomes in natural resource management. These include small group size, shared norms, interdependence among group members, and homogeneity of identities and interests (Agrawal, 2001). The organisation of farmers is generally considered easier in rural areas, as the social, cultural, ethnic, and economic background of the farmers is more similar and homogenous, and the communities are more stable (van Veenhuizen & Danso, 2007). However, forming and maintaining such groups in urbanised areas is difficult, as the nature of urban agriculture presents unique challenges (Schmidt, 2012). Firstly, urban farmers tend to be spatially fragmented, scattered across a large, rapidly urbanising metropolitan area. Furthermore, they tend to work in small, fragmented plots isolated from each other. Secondly, urban farmers are often stratified according to socioeconomic status (Mlozi, 1997). In their study on farmer associations and urbanisation in Tanzania, Schmidt et al. (2015) find that the degree to which urban farming associations are organised is related to the rate of urbanisation, specifically demographic changes, the institutional landscape in which they function, the environmental context, as well as underlying economic structure or local economic base. These structural conditions, in turn, impact the features of urban agricultural associations, their membership, how they relate to other institutions, the issues they face, and their economic and social roles (Schmidt et al., 2015). Therefore, factors affecting the organisation of urban agriculture need to be explored in depth.

1.5 Urban Agriculture in India

Urban agriculture has been undertaken in Indian cities with diverse socio-economic conditions and varying degrees of formal and informal support, says Sahasranaman (2016). According to her, one can classify urban farmers into two broad categories a) urban farmers by necessity and b) urban farmers by choice. The first category refers to smallholder farmers that subsist on patches of agriculture-zoned land that have gradually been enveloped by urban development. This includes farming in the slums of Cuttack, along the railway track in Mumbai and on the banks of the Yamuna in Delhi and Musi in Hyderabad, which helps the poor to meet their nutritional requirements and earn some money too in the process (Sahasranaman, 2016). The second category refers to eco-conscious and organic-friendly urbanites who want to grow their own rooftop fruits and vegetables. This type of urban farming is in its nascent stages in Indian cities (Kochi, Thiruvananthapuram, Bengaluru, Mumbai) and is characterised by a high degree of professionalism with a structured knowledge transfer and cultivation practice (Agarwal & Sinha, 2017). In a study among Organic Terrace Gardeners (OTG) and Vannyakulas (traditional horticulture community falling under OBC) in Bengaluru, India, Frazier (2018) highlights the caste and class specificities associated with urban farming. The OTGians are professionals working in the Information Technology Industry, embodying insecurities specific to their careers and lifestyles, such as unsafe food and the unknown food producer, and the decline of food production and green spaces in Bengaluru (best known as the garden city). Consequently, they seek to remedy the situation by placing responsibility on the ‘individual household’ through a commitment to ‘organic’ farming practices on their rooftops (privately owned spaces). In contrast, the traditional urban horticulturists displaced by different urban development priorities are committed to their traditional occupation produce for market. They often rely on chemical fertilisers, pesticides, and water from sewage drains and contaminated lakes. Although these market-oriented urban gardeners contribute to creating green spaces in the city and cutting down on food miles, they do not fit into the OTG community's understanding of ideal urban agriculture. These contrasting narratives embedded in class and caste structures limit urban agriculture's scope from being inclusive and collaborative (Frazier, 2018).

Frazier's study has set an example for a context-based study of urban rooftop gardening in India. However, it still represents the case of a large metropolitan city. Other smaller cities in

India have also taken up rooftop gardening, such as Thiruvananthapuram and Kochi in Kerala. Beyond media reports, the practice of rooftop gardening in this state has not caught the attention of social scientists. Each city's particular history and socioeconomic context may add to a comprehensive picture of urban gardening in India.

1.5.1 The Kerala Context and Study Gaps

Kerala represents a paradox in the global south's general discourse on urban agriculture. The state is on par with many developed countries of the global north regarding social development indicators such as literacy, infant mortality, and life expectancy. For instance, as of 1981, Kerala had a Physical Quality of Life Index (PQLI) score of 82, whereas the USA had scored 96.1 (Franke & Chasin, 1992). However, in 2010, the “Report on the State of food insecurity in Urban India” by the M. S. Swaminathan research foundation (MSSRF) stated that there is considerable food and nutritional insecurity in the urban areas, with southern states like Kerala and Tamil Nadu performing poorly on an indicator such as calorie deprivation. The report states that the urban population consuming less than 1890 Kcal/day increased from 19.8 in 1999-2000 to 21.8 per cent by 2004-05 in Kerala (Athreya et al., 2010). Sahasranaman (2016) draws attention to the nature of urbanisation and changes in cropping patterns that led to the state's nutritional crisis. She says Kerala is a continuous ribbon of settlement with a minimal gap between urban and rural. Kerala's rice deficit, which was 50 to 55 % from the early fifties to the mid-seventies, is today more than 85%. This has resulted, although slowly, in a consistent reduction of the area under rice cultivation and an increasing population (Kannan, 2000, cited in Sahasranaman, 2016). Over the years, the state shifted its focus to more remunerative and labour-saving cash crops such as rubber, coconut and banana. Thus, the State became dependent on imports from Tamil Nadu and Karnataka, even for vegetables. By the 1990s, the agrarian crisis in Kerala manifested in farmer suicides and pesticide poisoning from Endosulphan (Thottathil, 2012). Ever since, there has been growing awareness about the health risks associated with pesticide residues in food. This, coupled with the fact that the sample tests conducted in laboratories of Kerala revealed high chemical residues in fruits and vegetables supplied from other States, has generated a great interest in organic farming in the state. The state government formulated an organic policy in 2010. While the production of grains and pulses is limited by agro-climatic conditions, fruits and vegetables can be produced in the state.

Kerala's water situation is much better than many other states. Individuals and self-help groups have started cultivating on rooftops, balconies and backyards (Sahasranaman, 2016).

Even though many manuals on organic farming practices exist, there has only been very few qualitative research in particular, regarding Kerala's organic agricultural practices. Two notable ones are by Balachandran V (2004) and Sapna Thottathil (2012). Balachandran (2004) looked into organic farming practices in terms of their uniqueness, prospects and problems, profitability and viability using a mailed-in questionnaire and select case studies based on agro-climatic zones. Using a Political Ecological framework and extensive fieldwork, Thottathil (2012) has looked at Kerala's organic farming as an ecological counter-movement, representing an alternative form of state-led development prioritising local-level decision-making. She contends that the state's organic farming policy² is formulated and implemented in such a way that seeks to "re-embed market driven agriculture socially and ecologically" (Thottathil, 2012, p. 9).

However, the above studies have not explored the practice of organic /alternative sustainable farming in urban built spaces, particularly rooftop gardens and the experience of individual rooftop gardeners. Also, both have not explored the socio-economic background of the organic farmers, knowledge creation and transfer, people-plant interactions, and so on. This reveals a potential gap to be explored by ethnographic study. Given that Kerala had an urban share of nearly 48 per cent in 2011 and had the highest growth rate of urban population during the last decade (Ds & Ks, 2016), there is a need to study organic farming in the context of rapid urbanisation, lack of self-sufficiency in food production and the problems of food safety due to pesticide residues in imported food.

1.6 Theoretical Framework

This study aims to comprehensively understand urban gardening as an everyday practice in built environments involving multiple actors. Social practice theories are helpful in this regard. Besides, gardening is a practice that brings humans and nature (non-humans) in ways that demand us to rethink conventional boundaries such as nature/culture, rural/urban, and human/non-human. Hence this study borrows from the latest concepts in social practice

² Kerala State Organic Farming Policy, Strategy and Action Plan. Retrieved from <http://www.keralabiodiversity.org/images/others/organicfarmingpolicyenglish.pdf>

theories, and More-Than-Human approaches such as assemblages, new animism and shamanism.

1.6.1 Social Practice Theories

Understanding social practice has a long tradition in social sciences with notable contributions from sociologists such as Pierre Bourdieu and Anthony Giddens. According to the anthropologist Sherry Ortner (2006), the usefulness of practice theory lies in its ability to bridge the longstanding structure/agency debate in social sciences. According to her, practice theory “restored the actor to the social process without losing sight of the larger structures that constrain (but also enable) social action” (Ortner, 2006, p. 3). However, she also pointed out the neglect of the role of culture in early practice theories. Ortner added the three dimensions of power, time (historical framework), and culture to the existing theory of practice. Her approach is evident in her famous essay, *Making Gender: Politics and Erotics of Culture*, (1996) where she suggests that feminist theory needs to borrow from practice theories and vice versa (Ortner, 1996). Nevertheless, Ortner and early practice theorists put humans at the centre of social practice, even though any social practice involves interactions with materials and non-human agents.

1.6.2 Towards a More-Than-Human Approach to Social Practices in the City

Scholars such as Reckwitz (2002) and (Schatzki, 2002) provide a more inclusive definition of practice. For instance, Reckwitz (2002) defines practice “as a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge” (Reckwitz, 2002, p. 249). The above definition does not privilege one body (human) over another and includes materials (things) in the ambit of practice. Likewise, scholars from science and technology studies have pointed to the agency of objects (Latour, 1999). As Maller (2018) puts it, the city is always already more-than-human, “defined by the presence of multiple living non-humans, materials, built structures and technologies” (Maller, 2018, p. 73). Maller, therefore, opines that a modified social practice theory is the way forward to studying urban practices. She suggests three-elemental framework (Shove et al., 2012) for studying social practice. According to Shove et al. (2012), any social practice consists of a) meaning, b) materiality, and c) competencies. Meaning refers to the reasons attributed by the performers of any social practice.

Materiality refers to the things, beings (humans and non-humans) involved in the practice and interactions between them. Lastly, competency refers to the skill set and knowledge required to perform any activity. Following this framework, the present study looks at rooftop gardening in terms of its meaning, materiality and competencies as it involves humans, non-humans, and things and built environments.

Further, within the materiality framework, the study incorporates concepts such as ‘assemblage’ and ‘becoming’ (Deleuze & Guattari, 1988) and anthropological concepts such as ‘new Animism’ to analyse transformations and relations that emerge in urban gardening. Assemblage denotes the coming together of heterogeneous elements (in this case, gardeners, plants, pests, soil, technologies, and things), whereas ‘becoming’ refers to the potential for transformation of a being. Gardening is a transformative process creating mental and material transformations. Animism was a concept used by colonial anthropologists to contrast primitive thought with modernist/ scientific thought. However, new animism expressed through the work of scholars such as Harvey (2014), Abram (2005), Bird-David (1999), Ingold (2000), and so on looks at it as a relational epistemology, an alternative, responsible and respectable way of interacting with nature. “Animism is about a world full of immediate relational beings”(Bird-David, 2013, p. 27). New animists recognise practices attributing personhood to beings and things other than humans as making the world more habitable. Hence, the present study employs this concept to examine the nature of relationships human gardeners cultivate with their garden plants.

Like animism, early anthropologists cast shamanism as a religious practice by specific community members with special powers to communicate to the unseen world and engage in healing and various forms of community welfare. “For most enlighteners the shaman was a model for irrational behaviour” (von Stuckrad, 2002, p. 773). However, lately, the concept and practice have become popular in many Western societies as neo-shamanism and Western shamanism. Modern Western shamanism attempts to re-enchant nature, a counter-reaction to disenchantment between material and sacred brought on by industrial urbanisation (von Stuckrad, 2002). In the context of the present study, instead of neo-shamanism, the word ‘ecological shamanism’ has been coined to make sense of how it enhances urban gardeners’ competencies and provides a larger meaning to the process.

Therefore, this study follows social practice theories, particularly the three-elemental framework of social practice given by Shove et al. (2012), and makes use of Deleuzian concepts

of assemblage and becoming and anthropological concepts of new animism and shamanism to explain the relations transformations and forms of capacity building concerning urban rooftop gardening in Thiruvananthapuram.

1.7 Objectives

- 1) To identify various actors involved in urban rooftop gardening and their socioeconomic background.
- 2) To analyse meanings attributed to this practice by various actors.
- 3) To document the various stages of the practice, materials involved, and relationships emerging in built environments.
- 4) To understand knowledge production and transfer with respect to urban rooftop gardening.
- 5) To understand the process of commoning (formal and informal grouping) that may be built around urban gardening.

1.8 Methodology

This study has selected the area under Thiruvananthapuram Municipal Corporation for fieldwork, using relational ethnographic methodology and purposive sampling.

1.8.1 Study Area-Thiruvananthapuram Municipal Corporation, Kerala State, India

Kerala has a population of over 33 million, and the capital city of Thiruvananthapuram is the second most populated district in the state, according to the Population Census 2011. Besides, it has the highest population density of 1,508 per square kilometre. Of the four urban bodies in the district, the Thiruvananthapuram municipal corporation is the largest by area and population, with 100 wards and a population of 9 57,730 inhabitants. Suchitra (2015) reports that, as per official estimates, there could be a minimum of 20,000 rooftop cultivators in each of the 14 districts in the state. In 2010, the Horticulture Mission distributed thousands of such bags with a variety of plants and a guide free of cost. In Thiruvananthapuram city, more than 33,310 households were given 25 such grow bags each. Of these, 60% are continuing rooftop farming as of 2015, according to agricultural officials. Besides, extension services are more robust in the capital city. Joint ventures involving gram panchayats and *Krishi Bhavan* (local agriculture office) provide technical advice and assistance in vegetable gardening and plot setting (Suchitra, 2015). In addition, the pilot study revealed that an NGO named Thanal is

actively encouraging lower-income groups in the city (though outside the limits of the city municipal corporation) who farm organically to market their produce in the city. They have set up organic bazaars for this purpose. Hence, the chosen study area makes a case for exploring ‘organic’ farming practices amidst congested built complexes (rooftops, small homesteads) and scattered, limited inputs (soil, seeds, water, knowledge).

1.8.2 Relational Ethnography

Constructing a primary object of analysis is crucial to ethnographic methodology. Desmond (2014) argues that group and place-based ethnographies carry inherently substantialist perspectives. Group-based studies primarily focus on the habits, beliefs, behaviours, and interactions of individuals grouped (by society *and* the fieldworker) based on some shared social features, such as race, gender, class, sexuality, occupation, political identity, religion, so on. For instance, poor black families. Place-based ethnographies focus on the organisation, structure, and dynamics of specific types of social habitats, be they residential (e.g., neighbourhoods), occupational (e.g., workplaces), or organisational (e.g., political associations). Both place and group-based approaches accept as the starting point of inquiry “internally homogeneous and externally distinctive and bounded objects” (Wolf, 1982; cited in Desmond, 2014, p.551). Instead, “a relational approach incorporates fully into the ethnographic sample at least two types of actors or agencies occupying different positions within the social space and bound together in a relationship of mutual dependence or struggle” (Desmond, 2014, p. 551). Thus, a relational ethnographer looks for the following

1. The points of contact and conflict.
2. Production of coordinated action.
3. Documenting the ecology of a field.

1.8.3 Study Population and Sampling

The study has been conducted over ten months, from June 2019 to March 2020. Given the specific focus on relations and processes involved in rooftop gardening, the study population consisted of not only the rooftop gardeners, but also the institutional experts, and other heads of civil society groups interacting with each other and making this happen.

1. Identifying rooftop gardeners: 150 individual rooftop gardeners were interviewed in this study. Some of these were randomly chosen from the official data of selected Krishi

Bhavans (local bodies of the State Agricultural Department). The remaining half were approached through snowball sampling.

- a. Purposive random sampling- The pilot study revealed that Krishi Bhavans were an essential point of contact, acting as nodal agencies for distributing grow bags to urban growers on behalf of the State. There are 11 *Krishi Bhavans* in Thiruvananthapuram, catering to the total 100 wards in the city corporation. Of these 11 Krishi Bhavans, one *Krishi Bhavan* in the city centre, situated at a place called Palayam, was purposively selected because it has the maximum number of wards (53 out of 100) under its jurisdiction, and, is reported to have distributed grow bags to around 1200 people. Another Krishi Bhavan at Kudappanakunnu was also selected because of being a pioneer in grow bag distribution and labour support (Karma sena) for installation. Rooftop gardeners were randomly chosen from the latest grow-bag distribution list of these two Krishi Bhavans.
 - b. Snowball sampling- In snowball sampling, one starts by identifying a few respondents who match the criteria for inclusion in one's study and then asks them to recommend others they know who also meet our selection criteria. This sampling was used to access active gardeners not necessarily connected to Krishi bhavans, who farm in the given study area. Through this method, the researcher connected with 75 (the remaining half) of the research participants. Some were members of the two popular organic marketing groups, namely Krishi Bhumi and Swadeshi Karshika Vipani.
2. Expert sampling-This is a technique where respondents are chosen in a non-random manner based on their expertise on the phenomenon being studied. In this study, expert sampling was undertaken to understand the perspectives of agricultural officers and trainers in organic farming and the heads of civil society activists. Through expert sampling techniques, four agricultural assistants, four Karma sena workers, an NGO activist, and eight agricultural scientists were interviewed. This helped in understanding the role and perspectives of multiple actors involved.

1.8.4 Methods of Data Collection

Conducting ethnographic studies in the cities demands innovation on the part of the researcher (Jaffe & Koning, 2015). Given the urban study context, various methods were used to gather data. The fieldwork was conducted in two phases. The first phase was between June-December 2019, and the second between January-March 2020.

The researcher used the following methods of data collection:

Household Schedule: As a primary step, a household schedule was used to obtain the age, gender, family size, income, educational, and marital status of the gardeners, as well as details of migration, if any. This data has been used to generate a socio-economic profile of the gardeners, the study's first objective.

In-Depth Interviews: The researcher conducted a face-to-face interview with the research participants after filling up the schedule. Each interview was semi-structured and ranged from 45 minutes to three hours. Interviews were held in Malayalam, the native language of the respondents. These interviews helped to gather the gardeners' perspectives of 'organic', their experience with rooftop organic gardening, and their opinions about the government policy of grow bag distribution. With their consent, these interviews were recorded. Following this, the researcher and the gardener took a garden tour and engaged in various sensory methods besides taking photographs. This helped in understanding relationships emerging at the rooftop through human-nonhuman interaction. The interview method was also used to interview experts such as agricultural scientists and officers at the Krishi Bhavan. The researcher also visited the Agro bazaar, a state-run shopping complex supplying gardening tools, and raw materials for city gardeners. Interviews with the staff there revealed the role of the bazaar in catering to the needs of the urban gardeners.

Sensory Methods: As Hannah Pitt puts it, "Researcher as a novice is inducted into knowledge by expert guides who show them around their worlds, an approach well-suited to attending to non-humans" (Pitt, 2015, p. 48). In her study of community gardens, Pitt used walking, talking, and taking photographs, to mention a few (Pitt, 2015). Similar methods were employed in this study. Besides, as mentioned earlier, the relational ethnographic method involves attending to 'points of contact'. The rooftop was an important everyday contact point where gardeners and their garden plants and other beings interacted. The first method involved walking with gardeners. As the researcher walked with them on their rooftops, they stopped by to introduce rare and favourite plants, besides attending to them and answering the researcher's questions. Sometimes, they plucked ripened fruits in the garden and offered them to the researcher, asking to taste. Thus, tasting and eating together became the following means to relate to the gardener's perception of organic, garden-fresh food. Then the researcher also engaged in deep looking. In her research on criminal leaders in Jamaica, known as 'dons' (Jaffe, 2012) engaged in a method she calls 'deep hanging out', which entailed long and deep engagement within a

specific locality in the city. Likewise, in this study, the researcher had to engage in a sensory method called ‘deep looking’ along with her gardeners. Walking and looking are “arts of noticing” (Tsing, 2015, p. 37), which help us attend to entanglements. Often in garden tours, gardeners would point out to some pest and exclaim, “Look! Here is *munja* (aphid)! Or Look! how the worm is curled beneath the leaves”. Deep looking served two purposes. Firstly, for gardeners themselves, it is an aspect of tending to garden plants by noticing and managing pests. Secondly, the researcher learnt about various pests and their places through this process, which is more profound than mere walking with gardeners and learning the names of various garden plants they grow.

Learning from Gardeners: The researcher had no prior experience in gardening before embarking on this study. She had no experience in growing any of the food plants the gardeners cultivated. Besides, initially, as mentioned above, the researcher focused mainly on observing, walking, talking, tasting, and looking deeply with the gardeners in the garden while sidelining any attempt on her part to interact directly with the non-humans (plants) with whom this experience was co-created. However, within a few weeks, it became clear that one has to engage in gardening oneself to relate to the growers’ experience. The rooftop gardeners in this study were eager to share seeds with the researcher and teach her how to grow them. Soon the researcher began sowing a few spinach and cowpeas. The emotions of a gardener occurred to the researcher as she went through emotional cycles of joy, wait, and sadness, just like her study participants do. This also helped in strengthening the bond with the gardener. Besides, it helped in understanding the role of seed exchange in keeping the practice going.

Observation: Although the researcher could not volunteer at anybody’s garden, she participated in workshops, gardener’s meets (where trainers and gardeners interacted), and two community-run local organic markets (where buyers and sellers met around safe organic food). Thus, workshops and organic markets were identified as other ‘points of contact’ after rooftops. At organic markets, she could observe ‘coordinated action’ and conflict. Besides, there were many virtual points of contact on social media platforms such as Facebook and Youtube, where much of the discourse happens regarding the best farming practices, availability of inputs such as seeds and information regarding markets for the sale of produce. Although the researcher could not gain access to WhatsApp groups, she observed and followed the Facebook pages and YouTube videos related to gardening, which the research participants mentioned.

Case Study: Among the rooftop gardeners, some were experts in gardening for more than twenty years and received recognition for their unique, innovative methods. The cases of such long-term gardeners helped to gather a historical perspective of this process.

Document Analysis: The Annual plans of the agriculture and farmers' welfare department, horticulture department, and Haritha Keralam Project³ were examined for budget allocation, vision statements on food security, and focus on target groups. From the Farm Information Bureau, magazines from 2013 to 2019 on organic gardening were collected to understand knowledge transfer through popular media.

Mobile Methods: It involves moving with participants. "Mobile methods help to track the movement of people, goods and ideas, but they can also enable us to understand the larger structures that organise this movement" (Büscher et al., 2011, cited in Jaffe and Koning, 2015). To understand the process of grow bag distribution from source (Agro service centres, Krishi bhavans) to destination (rooftop), the researcher travelled with the distributors, who were popularly known as Karshika Karma Sena (food security army) in their small truck loaded with grow bags and drip irrigation tubes. This helped the researcher learn the best time to supply grow bags, the difficulty of navigating through the city during rains, and the timing problems in the government's growing bag distribution policy.

1.9 Limitations of Study

Access to Gardener's Online Groups: The research participants in the organic market had strict admission rules into their Whatsapp groups. This is because the group was solely created for information exchange among the self-certified sellers of the organic market. Confidential information, such as the weekly price of products decided by the admin, was posted in the group, which could not be shared with outsiders. Thus, the researcher did not become part of this online community, although she could interview the members in person.

Social Position of the Informants: Scholars have pointed out several issues in studying 'up', such as informants becoming too concerned about their privacy, difficulties of access, and reduced time for interviews (Jaffe & Koning, 2015). In this study, the researcher interviewed older people, most educated and equal to or higher in economic status than her. There was a strong urge to protect information regarding their economic and social status. Many informants

³ A mission to improve waste management, conserve the natural resources and promote organic farming. See <http://haritham.kerala.gov.in/haritha-keralam/> for further details.

did not divulge information about their income and caste because they found it unrelated to gardening. Further, compared to the gardeners, the agricultural officials were sceptical of recording interviews expressing their views on government policies within the office premises.

Phone Interviews: Unlike the cordial interaction due to the key informant introducing the researcher to other gardeners, contacting people from Krishi Bhavan's list was difficult. Many did not consent to an in-person interview when the researcher contacted them over phone. This is perhaps due to two reasons. Firstly, people were wary of letting a stranger, whose voice they heard over the phone, enter their most private space, which is home. Secondly, many did not sound very satisfied with the services of the Krishi Bhavan due to delays in grow bag distribution. As a result, the researcher had to do phone interviews, which could not go on for more than half an hour and were not as deep as in-person interviews.

Pandemic: The Covid-19 pandemic set in, the fieldwork had to be winded abruptly, and some of the interviews had to be done over the phone. Besides, over-the-phone interviews during the pandemic times had their own limitations.

1.10 Organisation of The Thesis

The thesis is organised into six chapters, including this introduction.

The introductory chapter begins by highlighting the issues around urbanisation and the rising trend of urban agriculture. It is followed by reviews of the existing conceptualisations of cities, their relationship with nature and food, history, definition, and debates around urban agriculture. Gaps are identified regarding the lack of adequate ethnographic studies of emerging forms of urban agriculture in built environments, particularly in South Asia. The conceptual framework borrows mainly from new social practice theories given by Shove et al. (2012). It also incorporates more-than-human actors in social practice through concepts such as materialism, assemblage, and new animism, which focus on relationality between humans and non-humans. Objectives of the study are listed. The methodology of relational ethnography is discussed, and the data collection methods are detailed, including the study's limitations.

The second chapter provides a socio-economic and cultural profile of the city and the home gardeners. It outlines the geography, political history, economy, administrative setup, and socio-cultural fabric of Thiruvananthapuram City. A profile of the urban home gardeners is sketched based on demographic variables such as, geographic distribution, age, gender, marital

status, family size, educational achievements, employment status, income, religion, community, migration, and morbidity.

The third chapter discusses the context in which urban grow bag gardening assumes multiple meanings and relevance for various groups such as the state, civil society and gardeners. Through their lens, the various precarity facing contemporary urban Kerala comes to the fore, especially land use transformation, consumerism, and the consequent impact on health in the form of emergent diseases such as cancer and other lifestyle diseases.

The fourth chapter discusses material aspects of grow bag gardening in its various stages, from sourcing to sowing, tending, harvesting, and sharing involving people, plants, pests and other ‘things’. It highlights the mutually transformative aspect of gardening, making it an animistic performance of kinship at various levels: firstly, the kinship between people and plants, secondly between plants and pests and lastly people-people kinship. Therefore, it shows how urban home gardening enables the creation of a care world not only at home but also in the city through acts of sharing and forming organic marketing communities.

The fifth chapter details the knowledge production and exchange of this social practice. It details the formal and informal sources through which gardeners gain competence. It examines the role of agricultural officers, scientists, State, model rooftop gardeners, childhood memory, ecological shamans, and social media in building urban home gardeners’ competencies.

The final chapter summarises the findings of the study. It states how studies on urban gardening may throw light on human-environmental relations in the city and thereby contribute to Urban Anthropology by conceptualising cities as animistic spaces. Further, it provides recommendations for policymakers and discusses ways in which the study of such practices can be improved.

Chapter 2

A Socio-Economic and Cultural Profile of the City and Rooftop Home Gardeners

2.1 The Landscape

Thiruvananthapuram (popularly Trivandrum) is a coastal city that shares its name with that of the district in which it is located. The latter is the southernmost district of the South Indian State of Kerala, a small strip of land between the *Sahyadri* (Western ghat) mountains in the east and the Arabian Sea in the west. Geographically, the district spreads across an area of 2192 sq km, of which one-fourth is made up of highlands, midlands constitute more than a half, and lowlands comprise five per cent (Kerala State Land Use Board, 2013). The southern stretch of the Western Ghats makes up the highlands on its east and the northeastern part. It hosts its second-highest peak, known as *Agasthyamala* (Agasthya Mountains). It is “verily an inexhaustible herbarium” (Sadasivan, 2000, p. 295). While the highlands are dominated by timber, tea, and other cash crops, numerous hills and valleys making up the midlands constitute much of the district (68.51%) and are rich in “paddy, tapioca, rubber, eucalyptus, spices, and cashews” (Kerala State Land Use Board, 2013, p. 46). The relatively narrow lowlands along the coastline (75 km) are covered with coconut trees. Unlike the flat morphology of coastal lands, the northern coastal region in the district, named Varkala, has a unique geological formation where an eighty feet high red laterite cliff and sediments dated to the Mio-Pliocene age are found (Radhakrishnan, 2014). The study area (Thiruvananthapuram City) is a lowland located to the southwest of the district, close to the coast, and has an undulating terrain with many low hills. Historians writing about the city in the last century describe it as a township of seven hills (Nair, 2015). Sixty per cent of the geographical area of the district is under forest cover (Forest Survey of India, 2021), which includes natural forests and plantations. Over the years, deforestation has been on the rise. According to the Global Forest Watch, ninety per cent of the total tree cover loss in Thiruvananthapuram has been reported in its natural forests since 2013⁴. The soils of the district consist of greyish-black alluvial sandy soil on the coast, yellow to reddish brown gravelly laterite soil of midlands, and reddish brown to black soils of the upland forests (Kerala State Land Use Board, 2013). The region has a hot tropical climate and

⁴ Global Forest Watch is an online platform to monitor forest cover changes across the world. See <https://www.globalforestwatch.org/> for more details.

is the first to receive the showers of the southwest monsoon (June-September) and the last to experience the retreating monsoon in October- November. Winters are mild and last for roughly three months, from December – February. Summer from February to May is sultry, with pre-monsoon showers in April. In recent years, the region has been experiencing climate change in terms of severe rain deficit, groundwater depletion due to deforestation, and changes in land use patterns from paddy to plantation crops such as rubber. Nevertheless, the climate and topography of the district, especially the midlands, are suitable for food and cash crop cultivation.

2.2 Political History

In the early centuries of the Christian era, known as the Sangam age, South India was parcelled between Cheras, Cholas, and Pandyas. However, Kerala's distinct geographical features, such as the eastern mountains, confined the Cheras to the middle part. The southern stretch known as *Nanjanad* (including present-day Thiruvananthapuram) was ruled by minor powers known as Ays (Menon, 2011). The long coast offered extensive trade opportunities. Less than twenty kilometres from Thiruvananthapuram city lies the port town of Vizhinjam, the capital of the later Ay kings who ruled this region until the tenth century A. D (Jayadevan, 1986). "There was neither a king nor a royal family at Thiruvitamkode (Thiruvananthapuram) till the 14th century" (Menon, 2010, p.139). Between the twelfth and the eighteenth century, the Venad kings rose to power in the region, and European traders (Portuguese, Dutch, and British) arrived. Venad rulers allowed the British East India Company to build their factories at Vizhinjam in 1664.

The Venad rulers had their capital at Quillon (60 km north of Trivandrum), and local landlords from the Nair community known as *ettuveetil pillamar* (lords of eight houses) and *yogakkars* (temple trustees) exercised control over parts of Thiruvananthapuram, especially the affairs of the wealthy Sree Padmanabhaswamy Temple (Menon, 2010). At the beginning of the eighteenth century, when conflicts began with the feudal groups trying to usurp the throne and Europeans vying to gain trade monopoly, the Venad ruler Marthanda Varma with his military and diplomatic skills, concluded treaties with the British, commenced a wave of expansion and consolidated his territories to found the kingdom of Tiruvitamkode, which extended from Kanyakumari in the South to Cochin in the north (Menon, 2010). An important gesture of the king was the dedication of the kingdom to the tutelary deity, Sri Padmanabha of the temple. "The implication of this step was that thereafter the king and his successors became the servants of Sri Padmanabha (*Padmanabhadhasas*) and ruled the kingdom in his name and as a sacred

trust” (Menon, 2010, p.232). Thus, Thiruvananthapuram became the seat of the Tiruvitamkode Kingdom from 1795-1949. In 1805, Tiruvitamkode entered an alliance according to which it became a subsidiary ally of the British and accepted the latter’s supremacy (Menon, 2010). Thus, under colonial rule, Tiruvitamkode became known as the princely state of Travancore and its capital as Trivandrum. Trivandrum underwent social, political, and administrative reforms in the 19th and 20th centuries. The celebrated social reformer Sri Narayana Guru was born in a village in Thiruvananthapuram district. He built a Shiva temple for the lower castes in 1888 (Houtart & Lemercinier, 1978), and under his leadership, anti-caste struggles took the form of temple entry satyagrahas. It culminated with Chithira Tirunal Balarama Varma (the then Travancore king) issuing in 1936, the famous temple entry proclamation, a statement declaring the state’s temples open to all people irrespective of caste (Jeffrey, 1976). Two years later, the first Travancore State Congress was held in the city, launching Travancore into an active freedom struggle through demands for responsible governance (Haridas, 1977). In 1947, when India gained independence, Thiruvananthapuram became the capital of Travancore-Cochin state. Following its merger with Kerala in 1956, it remains the administrative capital. The memoirs of foreign poets who visited Trivandrum in the early 1950s romanticise it as “a little but lovely city in the region now known as Kerala... the men distil a palm wine which they call toddy... the people who were not shy” (Laughlin, 1996, p. 86). On the other hand, in the novels of Malayalam writers reflecting upon the socio-political conditions of early post-independence, the administrative, bureaucratic city comes across as “This metropolitan city which still has its rural skeleton thinly veiled by the flesh patches of urban growth” (Paniker, 1990, p. 79). Thus, this city’s political history reveals it as an administrative, religious, and trading township since ancient times and an active centre of socio-political reform.

2.3 Demography

According to the Census (2011), the district had a population of 33,01427, of which 47 % live in rural areas and over half of the population (53.66 %) in urban areas. It makes it the second most populous in the state but first in terms of urban population density (3068 per sq km) (Kerala State Planning Board, 2021). The study area Thiruvananthapuram municipal corporation has a population of 7,43691, of which 48.67% are men and 51.32 % are women; Scheduled castes constitute nine per cent of the population, whereas scheduled tribes make up only 0.5 % (Census, 2011). The number of literates in Thiruvananthapuram is 89.4%, slightly less than the State average (Census, 2011). Regarding the sex ratio (number of females per

thousand males), urban areas in the district have a sex ratio of 1068, whereas, in the rural, it is 1111. Among others, migration plays an important part in changing the age and sex composition of a population. Intra-district migration (population migration from rural areas of the same districts) and inter-district migration (from other districts of Kerala) contributed hugely to the process of urbanisation in Kerala (Kerala State Planning Board, 2021). Besides intra-state migrants, the state also hosts inter-state migrants. According to the Economic Review of the State Planning Board (2021), Thiruvananthapuram has the second largest concentration of migrant workers from other parts of the country.

To sum up, the city hosts intra-district migrants (8.7 %), inter-district migrants (3 %), and inter-state migrants (1.5%) (Kerala State Planning Board, 2021). Besides migration, ageing is another demographic phenomenon in the district, as well as in the State. Kerala is fast ageing and tops the country in terms of the proportion of elderly (National Statistical Office, 2021). According to estimates, nearly 20 % of the state's population is over sixty years of age and will reach 26 % by 2026 (Govind, 2021). According to the annual reports of the Social Justice Department (2022), the highest number of calls for assistance from the National Helpline for the elderly, known as Elderline, were received from Thiruvananthapuram district during October 2021 and March 2022.

2.4 Economy

At the beginning of the nineteenth century, Travancore had a non-monetized economy, with paddy the principal crop growing in low-lying areas of Kuttanad and Nanjanad, followed by coconut in low and midlands (Prakash, 2017). Besides, “peasants grew a little pepper vine in their garden land along with other crops” (Prakash, 2017, p. 4). Thus, the traditional form of cultivation was homestead cultivation “of mixed cropping, and combining perennial tree crops with annual vegetable and other food crops in its garden lands, and even in its wetlands which are interspersed with small garden lands in which houses are located” (Tharamangalam, 2011, p. 71). In addition to agriculture, fishing and allied activities were practised along the coastal parts. Prakash (2017) outlines the region's economic history from the 1850s to the 1980s. He notes that with the founding of the Travancore kingdom, the state took ownership of more than half of cultivable lands and set up a system of permanent tenancy. By the 1880s, more lands were reclaimed, irrigation facilitated, and new crops such as tapioca and coffee were introduced. “Tapioca began to be used as a substitute for rice by the poorer sections because of the rise in the price of rice since the 1860s” (Prakash, 2017, p.7). Livestock in the form of

cattle, buffaloes, sheep, and goats were abundant. From the 1860s onwards, under colonial rule, the state failed to impose import duties on paddy, which affected paddy cultivation, where it began actively promoting plantation crops, granted full ownership to tenants, and tea became an export item. The depression of 1925 affected the agrarian economy; between the 1930s and 1956, the area under paddy remained the same, whereas that under rubber and tea expanded. At the time of the formation of Kerala State in 1956, under the goal of self-sufficiency, too much emphasis was given to paddy and the use of high-yielding crops under the green revolution. Consecutively the area under paddy expanded till the 1970s. However, since then, it declined, and some of the areas under paddy got converted for coconut far well. Besides, the post-1970s cropping pattern shifted to plantation crops such as tea, coffee, cardamom, and rubber (Prakash, 2017).

Moreover, in the 1970s, people began migrating to Gulf countries, which impacted the economy. Trivandrum is the second largest in terms of emigrants (Zacharia & Rajan, 2011). Within a decade, the district experienced changes in land prices, construction materials, and consumer goods (Prakash, 1998). As of 2011, Thiruvananthapuram's urban area has only 4 % of its population involved in agricultural activities, 2 % in household industries, and 94 % of the population in other activities (Census, 2011).

Further, due to the emigration of the native population, the economy of Kerala today increasingly depends on migrants (particularly low-skilled). In his study among migrant workers in the Thiruvananthapuram district, Saikia (2015) notes that higher wage rates and the real estate boom in Kerala, following the out-migration of the state's working age population, attracted men from Assam and West Bengal who engaged in temporary and unskilled tasks at construction sites besides casual work at other places (Saikia, 2015). Urban residents also hired many to pick palms and clear weeds at their residential plots. A study by Zachariah & Rajan (2011) states that the city of Thiruvananthapuram is the first choice among Gulf returnees, thanks to its rapid urbanisation, the economy of Kerala and Thiruvananthapuram is predominantly remittance-based. However, due to being administrative capital, the latter also employs some of its population in government jobs. Besides, in and around the municipal corporation is a concentration of services such as trade and commerce. The backwardness of industrial development in the state is attributed to complex labour relations, lack of land availability, and power shortages (Mani, 1996). However, the service sector has been booming since the beginning of this millennium. Following economic liberalisation in 1991, the state government established a Techno Park in the capital, the largest in the country, supporting the

software industry. As per the State's Economic Review (Government of Kerala, 2017), Techno Park employs 52,746 people and reported an export income worth 5000 crores.

2.5 Legislative, Administrative, and Judicial Setup

Except for the High Court, which is based in Kochi, the offices of the legislature (Legislative Assembly) and executive (the Secretariat) are housed in the capital city. Kerala was the first state in the country under colonial rule to have a legislative council in 1888, and in 1932 bicameral legislature consisting of the Travancore Sri Mulam Assembly and the Travancore Sri Chitra State Council was formed in Thiruvananthapuram (Kumar & Rajkumar, 1940). These were acts of piecemeal devolution of power, and ultimate authority lay in the hands of the ruling kings and their divans. As monarchy gave way to democracy, with the complete transfer of power to people's elected representatives, the first legislative assembly after Kerala was formed in 1957. The legislative assembly is known as *niyamasabha*. Since 1957, the government in the state has alternated between the two political parties: The left Democratic Front (communist bloc) and the United Democratic Front (Congress bloc). At the time of the present study, the fourteenth legislative assembly was in progress under the leadership of the left democratic front. Out of the 140 seats in the assembly, the district contributes one-tenth of the legislators.

Administratively, the district falls into two sections: Revenue and local self-government (Census, 2011). Under the revenue system of administration, the district constitutes a single revenue division and is further divided into taluks and villages. Four taluks are Chirayinkeezhu, Nedumangad, Thiruvananthapuram, and Neyyattinkara, and 115 revenue Villages (Census, 2011). Under local self-governance, one Municipal Corporation, 4 Municipal councils, and 78 Gram (village) Panchayats constituted 83 Local Self Governments (LSG) till 2006. 5 Panchayats were merged to form Thiruvananthapuram Corporation in 2010 (Census, 2011). The study area, Thiruvananthapuram municipal corporation, has 100 wards. As per the district urbanisation report, urbanisation and migration are more in LSGs surrounding the corporation. (Census, 2011). Such growth of the census and statutory towns and several urban agglomerations other than Thiruvananthapuram, the capital city, is called a dispersed pattern of urbanisation (Vaddiraju, 2020).

Further, these recent growth trends create challenges for urban governance. Thus, the model of local self-governance in Kerala, which hitherto focused on rural areas, needs to be extended to

urban local self-governance (Vaddiraju, 2020). Scholars examining the existing legislation, such as the Kerala Municipality Act, have pointed to the extraordinary powers of the state government to overpower the decisions of urban local bodies (Mathew & Dhanraj, 2017, cited in Vaddiraju, 2020). Under the Smart Cities Mission⁵ launched by the Government of India in 2015, Thiruvananthapuram and Ernakulam are the two cities chosen from Kerala to be converted into smart cities. The mission demands setting up a Special Purpose Vehicle (SPV) as a company that will undertake projects. Also, the State government and the urban local bodies have an equal share in the company. The project is modelled on 1) area-based development, which seeks to improve, renew, and extend the city, and 2) pan-city initiatives that affect the city population. Although the mission incorporates urban local bodies, the model is city-centric (assumes outward growth from one chosen primary city), which is not in line with the scattered urbanisation model in Kerala, as discussed above, where urbanisation is simultaneous and evenly spread in areas outside the capital city. Important matters such as water management require a “participatory polycentric governance”⁶ (Harilal & Chattopadhyay, 2020, p. 19) involving the city and its hinterlands.

The judicial set-up of the district consists of one Principal District and Sessions Court, six Subordinate Judges/Asst. Sessions Courts are located in the Court complex at Vanchiyoor in the city centre⁷. Travancore kings built this complex in European-style architecture. Besides, there are courts to settle family disputes, tribunals to decide on motor accident claims and resolve conflict among cooperatives and local self-governments. These are spread across the district. The problem of inefficiency in terms of delays and backlogs, which plagues the judicial system in the country, is a feature of the district judiciary in Kerala as well. Thiruvananthapuram tops the state in terms of pendency of civil cases and second with respect to criminal cases (Sudhi, 2019). For instance, the capital tops in the number of divorces; as of 2017, 3328 divorce cases were pending in its family courts⁸. In an attempt to clear the pendency, in 2011, an evening court was set up in the city⁹.

⁵ See <https://www.smartcitytvm.in/index.php/home/about-smart-city-mission>

⁶ Polycentric governance approach, popular in commons literature, involves multiple centres of decision making, each exerting some form of autonomy. These stand in between centralised and decentralised systems of governance. See Carlisle & Gruby (2017) for more analysis of this concept

⁷ See <https://trivandrum.nic.in/en/courts/>

⁸ See <https://www.thehindu.com/news/national/kerala/divorce-cases-highest-in-thiruvananthapuram/article18378136.ece>

⁹ See <https://www.thehindu.com/news/cities/Thiruvananthapuram/city-gets-first-evening-court/article2321581.ece>

2.6 Society

The geo-political history of Kerala contributed to a plural racial composition that the region is indeed “an ethnological museum” (Menon, 2010, p.54). The prehistoric society in Kerala is argued to have been inhabited by tribes of the same ethnicity (Sadasivan, 2000). “Such hill tribes as the Kadar, the Kanikkar, the Malapandarams, the Mutuvans, the Ullatans, the Uralis, the Paniyas etc., who live in the forests of Kerala State even today are said to be representative of the Negrito type” (Menon, 2010, p. 55). Even during the Sangam age, although there were many communities, the society had not differentiated into caste hierarchies nor practised untouchability (Menon, 2011). “Such communities as the Panas, the Kuravas, the Parayas, the Vetas and others were held in high esteem by kings and nobles ... enjoyed the right to a full education. The Panas were superior to the Brahmins of the day in their intellectual and cultural accomplishments” (Menon, 2010, p. 77). Until the 5th century, no major religion existed except the veneration of war Goddesses and ancestral worship (Menon, 2011). The Ays who ruled the regions constituting the present Thiruvananthapuram practised *makkathayam* (patrilineal system of inheritance).

Between the 8th and 18th centuries, society became stratified and racially complex. This period is characterised by the conversion to Brahminism of some of the native population, who came to be known as Namputhiri Brahmins; these Namputhiri Brahmins, in turn, adopted some others as *Sudras* (serving class), of whom *Nairs* became prominent offering military assistance to the chieftains and also to the Portuguese (Sadasivan, 2000). The *Sudras* took the title of *pillas* in the southern part of Travancore, the famous among them being the *ettuveetil pillamar*, who conspired against early Travancore kings (Sadasivan, 2000). The hypergamy of Nair women with Namputhiri Brahmins and the matrimonial alliance of fishing communities with Arab and Europeans was common, as was also untouchability (Menon, 2010). Thus, the nineteenth-century Travancore was marked by “a rigid caste system with Brahmins at the apex, Nayers and Syrian Christians in the middle, Ezhavas and Mukkuvas (fishermen) below Nayers, and Pulayas, Parayas and Nayadis at the base of the hierarchy” (P. Radhakrishnan, 1977, p. 76). The Namputhiri Brahmins followed patriliney and primogeniture, whereas the Nairs and Ezhavas practised matriliney and matrilocal residence in a joint family known as *taravad* (P. Radhakrishnan, 1977). Travancore royals practised *marumakkathayam*, whereby the heir to the throne was not the king’s son but his eldest sister’s (Menon, 2010). Marriage among the Nair community was simple, known as *sambandham*, which could be made or broken easily; a Nair

woman could have many husbands, with none having any right over her or her children (P. Radhakrishnan, 1977). The Nairs were not only a numerical majority but also their landholdings, hypergamous relations with higher caste Hindus and Travancore kings, privileges in administration, and ability to enslave other lower castes such as Ezhavas, qualifies them as “dominant caste” in anthropological terms, according to Jeffrey (1973). Such a rigid society underwent drastic changes from the mid-nineteenth century, an important feature of which was the decline in the dominance of the Nairs due to the impact of a cash-based economy, conversion of lower castes to Christianity, western education, communication technologies as well as colonial interpretation of customary law (Jeffrey, 1973). The Nair matrilineal joint family system disintegrated as land became commodified, slavery was abolished in 1855, and the Travancore government undertook administrative reforms under the British, which allowed educated people from lower castes to compete with the Nairs for administrative positions (Jeffrey, 1973). However, Radhakrishnan (1977) argues that although the stronghold of Nairs decreased, it can never be said to have lost entirely but only taken new forms through the Nair Service Society (NSS), which was founded in 1912 to represent the interests of this community and continues even today.

The community which faced the most discrimination in the form of untouchability and ritual pollution under Brahmin-Nair dominance were Ezhavas. Early nineteenth-century writings describe toddy tapping and coconut farming as their ‘traditional occupation’ (Osella & Osella, 2006). However, according to historian Sadasivan (2000), they were indigenous inhabitants of the land, tracing the lineage from Sri Lanka (hence, Ezhavas, a modification of the word Elam), practising Buddhism, and skilled health care practitioners. Sree Narayana guru, their spiritual leader and social reformer, was foremost an Ayurvedic *vaidyan* (physician) (Cleetus, 2007). The *vaidyanmar* (physicians) enjoyed an eminent role in indigenous medicine in pre-colonial times, and those who had the right form of *yukti* (intuitive logic) and successfully cured diseases were believed to have *Kaipunya* (one blessed with certain spiritual powers) (Cleetus, 2007). Under colonial modernity, they faced the hegemony- of Western medicine and homogenisation of the indigenous medical system under the umbrella term Ayurveda. As a result, they gave up magico- religious elements in their traditional practices and selectively imbibed elements from the former systems to establish their autonomy, argues Cleetus (2007). Anthropologists writing about the condition of social mobility of this community in the early 20th century note that although many educational and economic opportunities in colonial times made them “turn their back to nineteenth-century agrarian order” (Osella & Osella, 2006, p. 571), with some of them

emerging as land owners, caste-based pollution rules were prevalent until the 1930s. A defining feature of their struggle for reform was by negating their nineteenth-century self “with a self-created identity built in large part upon a sense of themselves as ‘modern’ and placing them close to Kerala’s ‘progressive’ Christian communities and opposed to high-caste Hindus (savarnas: Brahmins, Nayers)” (Osella & Osella, 2006, p.57). In the family sphere, the breakdown of fraternal polyandry to give way to monogamy and the decline of matriliney occurred among Ezhavas, as in the case of Nairs (Datta-Majumder, 1947).

A description of the society in erstwhile Travancore is incomplete without reference to the fishing communities known as Mukkuvans. According to MacFarlane (1935), they were Dravidians and traced their lineage to the Paravan caste (among those at the base of the caste hierarchy). They converted to Roman Catholicism under Portuguese influence at the end of the sixteenth century (Macfarlane, 1935).

Currently, Kerala society is roughly made up of Hindus (including Dalits and backward classes), Christians and Muslims in a ratio of 60:20:20 (Osella & Osella, 2008). The last socio-economic survey conducted by the State government in 1968 revealed that Nairs formed nearly 15 % of the total population in the State (Statistics, 1969). The following source is the household sample survey by (Zachariah et al., 2003), according to which community-wise distribution of the population in Thiruvananthapuram as of 2000 was as follows: SCs/STs (13.4 %), Nairs (12.9 %), Ezhavas (12.4%), Syrian Christians (1.6%), Latin Christians (24.3%), Muslims (6.2 %) and other communities (9.7 %). Thus, the district of Thiruvananthapuram represents the multi-ethnic and multi-religious character of Kerala society as a whole.

2.7 Food, Clothing, and Habitation

Rice and Fish form the ‘base diet’ across Kerala (Osella & Osella, 2008). In the early nineteenth century, the upland hill tribes in southern Travancore (Thiruvananthapuram) known as *Kanis/Kanikkars* broadcasted wild rice, besides growing plantain, tobacco, hemp and occasionally caught fish by damming streams (MacFarlane, 1935). The diet of the *Mukkuvars* (fishing communities) in the lowlands consisted of fishes caught from shallow and deep-sea waters with nets and wooden boats (MacFarlane, 1935). In the mid-low lands, paddy cultivation got encouragement under the Travancore kings. However, under colonial rule, during the famine of the 1860s, the import of rice affected rice cultivation and its affordability to poorer sections (Prakash, 2017). Tapioca arrived as a saviour. Introduced into Thiruvananthapuram in 1883

from Brazil by Vishakham Thirunal Rama Varma, the then king of Travancore, to deal with famine, it soon gained popularity as poor man's food (Nagarajan, 2019). That it was a poor man's food is evident from the ethnographic accounts of some Ezhava (the erstwhile untouchable) community members who gained socio-economic mobility in the colonial period. As Osella and Osella (2006) note,

“A recurring theme was that elite homes (of Ezhavas) were decorated with solid gold life-size models of tapioca and yam plants, crops which had provided Kerala's staple in the pre-colonial economy before paddy cultivation took off and rice replaced roots as the main and most prestigious food source” (Osella & Osella, 2006, p. 571).

To conclude, rice, fish, and tapioca became the staple food of the people of Travancore by the end of the nineteenth century (Kumar & Rajkumar, 1940). Another notable feature of Kerala food culture is that except for the Nambudiri brahmins, who constitute a minority and practice vegetarianism, the rest of the society, including the Nairs (the high caste Hindus), follow a non-vegetarian diet, including eating beef (Osella & Osella, 2006).

Apart from the geographical location along the coast, which enabled fishing, and socio-economic factors, which led to the introduction of new crops such as tapioca into the food culture, Kerala's diverse food system, has traditionally evolved by tapping into the seasonal changes in weather by developing an agricultural calendar system known as *Njatuvela*. As per this agroecological tradition, a year with 365 days is divided into twenty-seven *Njatuvelas*, each made of roughly fourteen days. The twenty-seven *Njatuvelas* are named after one among the twenty-seven stars in the zodiacal belt. *Njatuvela/ njayar vela* is the sun's apparent movement across one star. Based on this calendar, agricultural activities are performed. For instance, of the twenty-seven *Njatuvelas*, *thiruvathira njatuvela* is the most auspicious. It is the period when the sun transits through the *thiruvathira* star and falls between the last week of June and the first week of July. This *njatuvela* is traditionally considered the best time to plant anything as this time is marked by adequate sunshine in the day and light evening showers. Sowing of paddy and pepper is done at this time.

Some of the traditional foods that are still in use in the state are *kanji* (rice gruel), served with mango pickles and lentil curry, *pazham kanji* (rice gruel prepared the previous night and served as breakfast the following day), *kuzhakkatta* (soaked rice ground into a paste, into which coconut scrapings are added to make it into balls and boiled in water), *ottada* (plantain steamed cake made of rice paste, jaggery, and coconut). Besides, the seeds and fruits of mangoes and

jackfruits make for various dishes. Thiruvananthapuram is the second-largest producer of jackfruits in the state¹⁰.

Thanks to the changes in the economy and ecology after independence, such as land reforms, the green revolution, and large-scale emigration of youth to the Gulf, agriculture took a back seat, and today Kerala is a consumerist state. Before land reforms, Kerala produced more than 50 per cent of its food grain requirements; however, it now produces less than 15% (Tharamangalam, 2011), becoming a food insecure state. Besides, thanks to globalisation, junk food culture has emerged in the state. In 2016, the State government imposed a fat tax of 14.5 per cent on junk food¹¹.

As far as clothing is concerned, in the past, the way of clothing of different communities reflected their position in the social structure. Among the Hindus, the high caste Nair men traditionally wore a *mundu* (woven, white cotton fabric tied below the waist, wrapping the legs), while the women wore *mundum neriyaathum*. It is a two-piece clothing in which *mundu* is worn around the waist till the feet, and *neriathu* is worn above the waist. They also carried an umbrella. On the other hand, the lower castes “could not carry an umbrella or cover their upper bodies (not even the women) and could not wear certain types of jewellery and footwear or use metal vessels and finely woven cloth” (Kurien, 1994, p. 394). Thanks to the political struggle in the early part of the twentieth century, many of the social disabilities of these communities were removed. Among the Christians, Syrian Christian women traditionally wore *chattayum mundum*. It is a two-piece dress in which a blouse called a *chatta* covers the upper body, and the *mundu* is worn around the waist, reaching to the ankle. Muslim women used to wear *kachimundu* around the waist, a full-sleeve blouse, and a *thattam* (a cloth in cotton or silk covering the head like a scarf). Today, *mundu/ mundu neriathu* is either home wear or festive wear. In the early part of the 19th century, during the reign of Travancore king Balarama Varma, his diwan Ummuni Thampi cleared a piece of land to the south of Thiruvananthapuram. He set up a weaver’s colony, naming it after King Balarama Varma as Balaramapuram. To this day, Balaramapuram, which is just twenty kilometres from the city, is a famous handloom centre that weaves the GI-tagged *mundum neriyaathum* with beautiful golden borders (Nagarajan, 2020). Nowadays, the middle and older men in urban Thiruvananthapuram commonly wear *mundu* at home, whereas officegoers wear shirts and pants. Middle-aged women, especially

¹⁰ See <https://www.onmanorama.com/news/kerala/2022/08/26/kerala-produces-crores-jackfruits-annual.html>

¹¹ See <https://economictimes.indiatimes.com/news/politics-and-nation/in-a-first-kerala-imposes-14-5-fat-tax-on-junk-food/articleshow/53113799.cms?from=mdr>

working women, wear sarees. At home, women wear sarees, a variant of salwar kameez (popularly known as churidar), or long maxi dress that covers them from neck to toe that became popular in the 1980s. Younger women, especially college students, wear long and short tops called *kurti*, a recently trending fashion. Adolescents, both boys and girls, wear T-shirts, Jeans and dress in line with global culture and fashion.

The settlement pattern of Kerala and the nature of its urbanisation is unique in terms of having a rural-urban continuum, as opposed to urban agglomeration. In this pattern of settlement, there is very little rural-urban divide. As Vaddiraju (2020) puts it, “to the eye of a casual observer, it is difficult in Kerala to make out what is an urban locality and what is rural” (Vaddiraju, 2020, p.10). Earlier, people lived in thatched houses with sloping roofs made of terracotta tiles. Since the mid-1980s, following the Gulf emigration, cement houses and flat roofs have been the structures of dwelling for Malayalees. As Lukose (2005) puts it, “The evidence of NRI remittances is everywhere. Land prices have increased due to intense land speculation by migrants eager to build their ‘Gulf houses’. Huge, upscale flat complexes now pepper the landscape, marketed as fashionable housing for Gulf returnees and for others who can afford them, leading to dire predictions about the consequences of a new ‘flat culture’. In villages, televisions, refrigerators, motorcycles, and new houses proclaim a family's Gulf connections” (Lukose, 2005, p. 924).

2.8 Language

The official language of the state Malayalam is also the language spoken widely in the district today. Some argue that Malayalam as a separate language evolved only in the ninth century because, until then, a form of dialect derived from Tamil was spoken due to the region being part of *Tamilakam* (Menon, 2010). Besides, the copper plate inscriptions of Ays concerning land grants were in Tamil. Menon (2011) points out that famous Tamil poets like Parinar, Ilango Adikal, and Kulasekhara Alwar hailed from Kerala. He concludes that under the influence of Brahmanism, Malayalam developed out of Manipravalam (a mixture of Sanskrit and Tamil); the old Vattezhuthu script was replaced with the evolution of a new script known as Grantha script (Menon, 2010). However, noting the preservation of specific syllable clusters and features in Malayalam which are not found even in protoTamil, (Govindankutty, 1972; Sadasivan, 2000) argues that a Proto- Malayalam was contemporaneous with Proto-Tamil, thereby negating that Malayalam was solely an offshoot of Tamil. Govindankutty (1972)

proposed that the genealogy of west coast dialects be traced to Proto-Tamil-Malayalam, instead of Proto-Tamil. However, others have pointed to the Buddhist influence in the Malayalam language. For instance, Menon (2010) points out the presence of Pali words in Malayalam. In 2012, a committee of experts deliberated on the antiquity, usage, and literary contributions of Malayalam, following which the central government granted it the status of classical language in 2013¹².

Earlier, the Malayalam calendar was in tune with Tamil Calendar (a sidereal solar calendar in which a year has twelve months. The new year began with the month of *Medam* (April- May) and continued through *Edavam* (May- June), *Mithunam* (June- July), *Karkidakam* (July- August), *Chingam* (August- September), *Kanni* (September- October), *Thulam* (October- November), *Vrischikam* (November- December), *Dhanu* (December-January), *Makaram* (January-February), *Kumbham* (February- March), and ended with *Meenam* (March- April). With the linguistic reorganisation of south Indian states to form the new state of Kerala, a significant change was the adoption of a regional calendar (Kollam era) in which the year began with the month of Chingam (August- September) and ended in Karkidakam (July- August).

The court language of the Travancore kingdom was Malayalam. Earlier, only Namputhiri Brahmins could enter government service. However, in 1891 a memorial was submitted to the then King seeking entry into government service of communities other than Namputhiris. One of its demands was to make knowledge of Malayalam imperative for government service (Tharakan, 1984). Further, a chief feature of Travancore education under colonial rule was emphasising vernacular (Malayalam) in primary education (Tharakan, 1984). Recently, Malayalam researchers have discovered as many as eleven dialects of Malayalam in use within the district of Thiruvananthapuram, given its cultural and geographic diversity (Nagarajan, 2016). Nevertheless, the city is the space where many of these dialects are temporarily replaced with a mainstream version of Malayalam, particularly by college students from suburbs who are embarrassed to speak their dialects in the city, fearing ridicule (Krishnan, quoted in Nagarajan, 2016). Although with the linguistic reorganisation of states in 1956, the adjacent Tamil-speaking district of Kanyakumari was separated from the state of Kerala, Tamil is spoken and understood by many in Thiruvananthapuram, particularly the fishing communities whose language is a mix of Malayalam and Tamil, yet different from the official version of both (Darwin, 2020).

¹² See <http://www.keralaculture.org/classical-language-status/548>

2.9 Festivals, Traditions, and Customs

Onam is the annual harvest festival considered the national festival of Kerala and celebrated across the state in different ways by all ethnic groups. It falls on the star day of *Thiruvonam* in the month of Chingam (the first month of the recent Malayalam calendar). Although no longer considered New Year's Day, *Vishu* (the first day in the month of *medam* (April- May) is another important festival celebrated across the state and in the district of Thiruvananthapuram. Onam is mentioned in Sangam literature, indicating its antiquity since the 2nd century A.D. (Kurup, 1977). Historically, Onam was a “temple-based community festival, celebrated over a period, presided over by the local chieftains who made presents to his subjects in token of their loyalty. At home, the people put on new clothes, discard old things and resort to pompous feasting” (Kurup, 1977, p. 101). Today, Onam is a family-centered festival. It is the time for migrants in the city to go back to their rural roots and get together with other family members. There are various stories related to the origin of Onam. However, the mythical one is of a king of the land called Mahabali, who had all of the earth under his control and planned to conquer the celestial kingdom eventually through a great sacrifice. The Gods of the celestial kingdom, fearing Bali, pleaded with Vishnu to check his expanse. At the time of the sacrifice, Vishnu appeared before Bali in the form of Vamana (a short, weak-looking Brahmin), asking for three portions of land. Bali, out of his generosity, conceded. Vamana soon grew in size, bringing Bali's kingdom into two portions. Having no land left to give as the third portion, Bali bowed his head and asked Vamana to measure the third portion from it. Vishnu pushed Bali down to the Nether lands to claim the third portion. Before being sent down, Mahabali raised a request that once a year, he wished to return to his land and visit his subjects. Onam is considered the day the king comes to visit his land. People dress up in their best and keep their homes and hearts clean and happy to assure the king that the land is as prosperous as it was during his time.

Like elsewhere in Kerala, in Thiruvananthapuram, Onam is celebrated for ten days, beginning with the star day of *Atham* to the star day of *Thiruvonam*. The important ritual on the day of Atham is making circular flower beds known as *Athappokkalam* and installing the figure of Onathappan (representing Siva). Kurup (1977) points out certain regional variations in the figure of onathappan. While Onathappan is represented in the form of a clay pyramid in northern Kerala, in southern Kerala (Thiruvananthapuram), he is represented by the pestle (top part of the grinding stone). Kurup (1977) also notes that Onam means different things to different communities, although the festival, broadly speaking, serves the function of

communal integration and harmony. Traditionally, the feudal class, Nayars and Namputhiri Brahmins saw it as an occasion to welcome Mahabali; they observed all the above rituals with pomp and show. Among the Tamil-speaking population, Onam's celebration is limited to having a feast on the day of Thiruvonam. Among the landless serfs, Onam is the time to worship ancestral spirits with liquor and rice cakes. The artisanal class saw it as an occasion to worship their implements. The hill tribes found it a good time to eat new grains and perform community hunting. The non-Hindus, i.e., Christians and Muslims, avoiding the ritualistic aspects, celebrated Onam by making *sadya* (feast) and buying new clothes.

The above observation by Kurup belongs to the early years of post-independence. Although some of his observations are valid even today, under urbanisation, and globalisation, Onam's celebration has taken new turns. In recent decades, the city schools, colleges, workplaces, civil society clubs, and media houses chart programmes to celebrate Onam at their convenience, mainly between the beginning of the Chingom month and a few days before the official holidays for Onam start. These institutions hold *Athapookalam* (flower bed making) competitions, not necessarily on the day of Atham, but where everyone, including the staff, participates and makes *sadya* (feast) together on their premises. They also engage in games such as *vadam vali* (tug of war). The city comes alive with a shopping spree on Uthradam (the day before Onam), traditionally known as *uthrada pachil* (the hustle of Uthradam day), when people gather vegetables, furnish their homes and get ready for Onam the following day. The city gets flowers for making flower beds from Thovalai, a small village in Kanyakumari, which was earlier part of the Travancore kingdom but merged with Tamil Nadu in 1956¹³. A unique aspect of Onam celebrations in the city is the 'float' or the festive parade on the last day of the Onam celebration. In this parade, artists, government departments, and private organisations display the cultural forms of the state and innovative themes on moving vehicles or by walking, similar to the parade held in New Delhi on Republic Day. During the year when this study was conducted, in 2019, the theme was resilience following the previous year's floods. Besides, as per green protocol, artists presenting their floats used materials made of cloth to avoid plastic-based displays. A third attraction was that floats from ten other states were also invited to perform that year, giving it a pan-Indian colour. The celebrations began at 5 pm and travelled through the city's busiest routes (Kowdiar to East Fort). As per the custom, the Governor flagged off the event. The best floats in select categories were awarded later at an auditorium

¹³ See <https://www.thehindu.com/news/national/tamil-nadu/bulk-selling-of-flowers-ahead-of-onam-festival/article7589548.ece>

Nishagandhi on the premises of the central stadium. Also, during my fieldwork, a week prior to Onam, the Krishi Kutumbam (a gardening community running a weekly organic market in the city) held Onam meet where hundreds participated, cherished the agricultural past of the State, exchanged seeds, seedlings, and made commitments to move towards a healthy Kerala, the organic way.

Besides Onam, there are a few local festivals unique to Thiruvananthapuram. One is the Hindu festival, Attukal *Pongala*, which fetches worldwide recognition for the city. Less than two kilometres to the south of the east fort, on the banks of the river Killi, is Attukal Bhagavathi temple, famous as the Sabarimala of women. An annual ten-day festival is celebrated in Kumbham (February- March), honouring the deity revered as *Attukal amma*. Folklore equates the goddess to Kannagi, the protagonist of the epic *Silappadikaram* (Sangam literature). According to the epic, Kannagi was a devout wife of a maritime trader named Kovalan, who lost his wealth failing for a courtesan. When he realises his folly and returns to Kannagi, the couple is pushed into poverty. Finally, as they begin to rebuild their life by trying to sell Kannagi's anklets, her husband is killed by the Pandya king of Madurai for allegedly stealing the queen's look-alike anklets which had gone missing around the same time. Kannagi then avenges the murder of her husband by standing up to the injustice meted out to her husband without fair trial and sets the city of Madurai on fire. According to the folklore of Attukal, Kannagi stopped at Attukal on her way back from Madurai, and her spirit was present during the festive occasion. The festival includes rituals like *Thalappoli*, *Kuthiyottam*, and *Ezhunallathu*, which involve mass participation of men, women and children (Mini, 2016). However, the *pongala* ritual on the ninth day steals the show. It is the largest all-women gathering in the world, where *pongala* (the ritual porridge made of rice and jaggery) is cooked by women devotees as an offering to the main deity.

Like the Attukal *pongala*, the Bheemapally *urus* is a festival among the Muslim community in remembrance of the honourable deeds of a woman named Bheema Beevi. It is held for eleven days per the Hijrah calendar. The Roman Christian community looks forward to Vettukad *perunnal*, a ten-day-long festival at the parish town of Vettukad, northwest of the city. It is celebrated in such a way that the third Sunday of November falls as the tenth day, a feast day. This feast is called the Feast of Christ the King. It is a five-hundred-year-old tradition. Lastly, there are two customary rituals that the Travancore kings initiated in honour of the deities of the land, which continue to date. These are associated with giving holy baths to the deities of the Padmanabhaswamy temple, to whose service the Travancore kings dedicated their

kingdom. The eldest members of the royal family take out a procession carrying idols from the temple and walk through the airport road to the nearby beach of Sankhumukham, a few kilometres west of the temple. During this time, services to the airport are suspended temporarily for a few hours. As mentioned, the ritual bath occurs twice yearly, once in Thulam (Oct-Nov) and the other in *Meenam* (March- April). Another ritual highlight is the re-enactment of the royal hunt, known as *pallivetta*.

2.10 The Dynamic, Multispecies City Centre

The city centre is a blend of religious, administrative, political, recreational, economic, and literary activities along the busy Mahatma Gandhi Road (M. G Road). It is a six kilometres long road that runs in the north-south direction. It begins at its southern end from the fortified area popularly known as *kizhakkekotta* (East Fort), enclosing the Padmanabhaswamy temple complex, where the city's past throbs beneath the busy present. The massive white fort gateway, on one side of the road, leads to the eastern entrance of the temple, which is heavily guarded by the police who ensure that visitors wearing pants or divided skirts have changed into the traditional *mundu* (the traditional single piece fabric worn around the waist) rented from the nearby stalls. Declared a heritage zone¹⁴ by the government, this fort area around the temple houses historical royal monuments and settlements beside the temple pond. From the relative quietude within the fort, the magnificent gateway opens into the busy world of commerce at the Chalai market on the opposite side of the M G road. The Chalai market, with a radius of one kilometre, dates back to the 14th century (Balan, 2021). The marketplace is a set of shops lined on either side of roads through which one has to navigate like in a maze. It has thriving wholesale markets for perishables such as vegetables, fish, fruit and grains and durables such as clothing, stationery and furniture. Most of the vegetables sold in Chalai come from Tamil Nadu, Karnataka, Andhra Pradesh and Maharashtra (Balan, 2021). The temple complex, Chalai market, and East Fort bus station form a religious, commercial and transport hub.

The next vibrant stop along the M. G. Road is the Statue Junction. It is so named after the bronze statue of Sir T. Madhava Rao (an able administrator to the then Travancore King), which stands in the middle of the road opposite the present government Secretariat building he built in 1869. "The statue is unprotected, a favourite perch for birds, and a site for bill-posters who keep its pedestal gaily plastered with notices of the latest meetings, films and demonstrations"

¹⁴ <https://townplanning.kerala.gov.in/wp-content/uploads/2019/10/Fort-Area-Trivandrum-City-English.pdf>

(Jeffrey, 1980, p. 485). The secretariat is the hotbed of Kerala politics and administration. Almost every day, the premises of the secretariat building is a venue for sit-in demonstrations, processions, and protests. Moving further north along the road, one reaches the next junction called Palayam¹⁵, a shortened form of the original *pattalapalyam* (a military cantonment) built by the British in the nineteenth century. Three centres of worship which define the junction today-the Juma mosque (popular as *palayam palli*) and the Hanuman temple were built by the British for cavalymen who came from various religious backgrounds, and the Latin cathedral of St. George was built around the latter part of the same century. Palayam is also the location of the central city stadium which hosts many sports, training, entertainment activities, and public ceremonies such as award distributions.

The M. G. Road ends at the most idyllic part of the city, which is the museum-zoo-public garden complex spreading over fifty acres of land (Namitha & Gangaprasad, 2020). Travancore was the first princely state under colonial rule to have set up a museum-zoo-garden combine (Amruth, 2011). The museum was a colonial project intended to educate and reform the public. Built in 1857, it was initially a museum of natural history with fossils of birds, insects, and animals of Travancore. Besides, ethnographic information gathered using anthropometric projects on the people of Travancore was used to set up plaster figures of hill tribes of the state. Thus, according to Amruth (2011), the museum became a vehicle in the larger colonial project of defining the self by representing, measuring, and curating the ‘other’ and thereby perpetuating binaries such as nature/ culture, primitive/civilised, and so on (Amruth, 2011). The museum was rebuilt in 1873 under orders from Lord Napier, the then governor of Madras¹⁶, after which it is now popularly known as Napier Museum. By the 1930s, it became a museum for arts and crafts and gradually, exhibitions replaced museums as more mobile forms of educating the public (Amruth, 2011). A public garden and zoo were set up in the same complex in 1859. “Botanical gardens are complex cultural sites where multispecies relations are cultivated and managed” (Hartigan, 2015, p. 481). The annual flower exhibitions at the complex are a big attraction to the city’s people. The Agri-horti-society has set up a permanent office and nursery at the complex. The zoo houses more than 80 wildlife species, including indigenous and exotic. Although these institutions' goals have changed from recreation to

¹⁵ <https://www.newindianexpress.com/cities/thiruvananthapuram/2022/jun/07/whats-ina-name-the-story-of-palayam-2462510.html>

¹⁶ See <https://www.napiermuseum.org/history>

conservation, this museum-garden-zoo complex makes the city centre a space for multispecies interaction.

From the brief descriptive account of the district and the city, it is clear that Thiruvananthapuram has been the centre of socio-political and economic changes in the state. Although today, agriculture is not the primary source of living for the population, traditionally, besides fishing, homestead gardening was the earliest form of engagement with the land, which formed the livelihood of the people. Further, the institution of public gardens, which were a means of educating the public in colonial times, continues today, engaging the city folk and keeping the gardening culture alive. Given this backdrop, the following section briefly describes the study participants, the home gardeners.

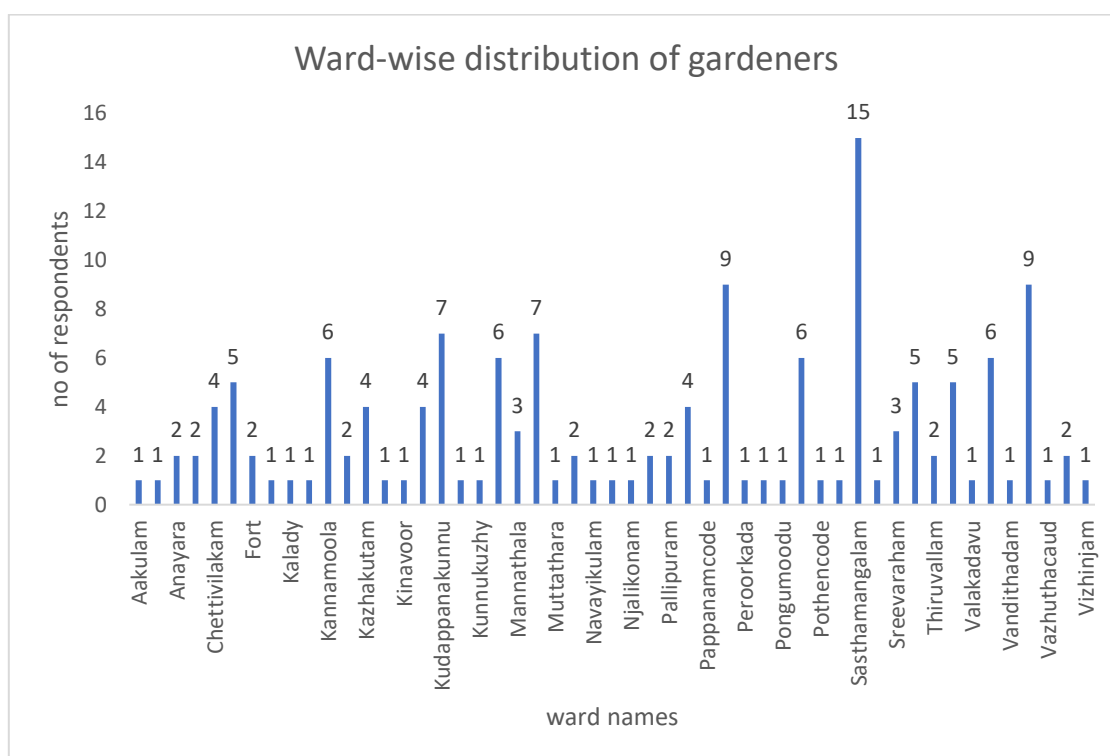
2.11 Home Gardeners- A Socio-Economic Profile

The socio-economic profile of rooftop gardeners has been sketched based on the data gathered from household schedules on variables such as residential area, age, gender, marital status, family size and type, education, employment status, income, house type, rooftop size, garden types, duration of gardening, livestock, migration, and morbidity.

2.11.1 Geographical Spread

As mentioned in the introductory chapter, the city of Thiruvananthapuram is administratively divided into 100 wards. Out of these, gardeners representing 51 wards were covered in the study, as shown below.

Figure 2.1 Ward-Wise Distribution of Home Gardeners in the Study



Source: Fieldwork

Figure 2.1 shows the ward-wise distribution of the study sample (150 rooftop gardeners) in Thiruvananthapuram. Out of the 51 wards covered in the study, close to half (i.e., 24 wards) contributed one gardener each to the study. This indicates the extensive spread of gardeners in the city. Further, it can also be observed that the ward named Shasthamangalam contributed to the largest number (15) of rooftop gardeners in this study. It is perhaps due to the proximity of Shasthamangalam (3 kilometres) to the city central Krishi bhavan (office of the department of agriculture distributing grow bags at subsidised rates) at Palayam. Next to Shasthamangalam, most gardeners came from Pattom and Vattiyoorkavu (9 each). Pattom is also close to Palayam. Besides, it is the centre of one of the two organic markets run by city gardeners. This has contributed to the increased representation of gardeners from this ward. In the case of Vattiyoorkavu, it is a rapidly growing suburb. It had a robust residential association that promotes urban gardening among its residents as part of welfare measures. These indicate that the proximity to distribution and marketing centres and active residential associations could affect the distribution of gardeners in this study. There were seven gardeners from the Kudappanakunnu ward. The Krishi Bhavan at Kudappanakunnu was the first to promote urban rooftop gardening in the city in 2010. However, at the time of this study in 2019, as seen from the graph, only seven gardeners from this ward were actively involved. This indicates that

although proximity to Krishi bhavans may facilitate uptake, it cannot guarantee the sustainability of the process. Overall, the distribution of gardeners in this study indicates that the activity has spread to many areas over time.

2.11.2 Age

Since home gardening demands considerable time and physical labour, Age is an important demographic variable that helps to understand which age cohort of the urban population engages in this practice and the probable reasons.

Table 2.1: Mean Age of Home Gardeners

Age (in years)	Number	Minimum	Maximum	Mean	Std. Deviation
	150	25	88	57.39	11.982
Total	150				

From **Table 2.1**, the mean age of home gardeners is 57.39 years. The high standard deviation of 11.982 indicates that the age of gardeners is spread across a wide range from 25 years to as high as 88 years. Further, the distribution of gardeners according to age intervals is indicated below.

Table 2.2: Distribution of Home Gardeners in Age Interval

Age interval	Frequency	Per cent
25-49	35	23.3
50-74	105	70.0
75-99	10	6.7
Total	150	100

From the above **Table 2.2**, it is clear that although people as young as 25 and as old as 88 are engaged in home gardening, 70 per cent of the gardeners belong to the age interval of 50-74 years, which indicates that the elderly are involved mainly in practice. This can be attributed primarily to the fact that the elderly (sixty years and above) gardeners had retired from formal work, whereas most gardeners aged 40-59 years were working full-time. This is illustrated in the following table.

Table 2.3: Cross-tabulation of Age and Occupational Status

Occupational Status	Age interval				Total count
	20-39	40-59	60-79	80-99	
Homemakers	3	11	2	0	16
Retired	1	9	63	5	78
Working	8	40	8	0	56
Total	12	60	73	5	150

The above **Table 2.3** shows that 63 out of 150 gardeners were retired and belonged to the age group of 60-79. Thus, these elderly gardeners could devote more time thanks to being at home. On the other hand, the working population who were gardening were only forty in number. Besides, as mentioned in the district's demographic profile, as per the Elderly of India Report 2021¹⁷, Kerala emerged as the state that has the largest share (16.5%) of the elderly in its population as of 2021, with the proportion of elderly in urban areas more than those in rural parts. This is attributed to a rapid decline in fertility and mortality rates in the state (Nag, 1988). Thiruvananthapuram has one of the state's lowest fertility rates (1.4) and is also home to many old-age homes (Rajan et al., 2020).

2.11.3 Gender

Of all demographic variables, gender is significant as it reflects the general division of labour in a society, besides the particular social attitudes towards gardening, if any.

Table 2.4: Distribution of Gardeners According to Gender

Gender	Frequency	Per cent
Male	82	54.7
Female	68	45.3
Total	150	100

¹⁷ Elderly of India Report, 2021, MoSPI, Government of India.

<http://www.indiaenvironmentportal.org.in/files/file/Elderly%20in%20India%202021.pdf>

Table 2.4 shows that men and women were involved in urban home gardening. However, there were more men than women gardeners. This observation contradicts many kinds of literature which argue that women, being managers of home, are more likely to engage in home gardening than men (c.f; Howard, 2006; Mitchell & Hanstand, 2008; Zasada et al., 2020). Further, we can observe that older men and middle-aged women dominated the scene. The following table illustrates this fact.

Table 2.5: Cross-tabulation of Gender and Age

		Gender		Total
		Male	Female	
Age Interval	20-39	4	8	12
	40-59	22	38	60
	60-79	53	20	73
	80-99	3	2	5
Total		82	68	150

From the **Table 2.5** above, it is evident that among the older age group (60-79 years), there were more men (53) than women (20) gardening, whereas, in the middle age group (40-59 years), women (38) gardeners were more pronounced than male (22) gardeners. This is because elderly male gardeners took to gardening post-retirement as a hobby. Further, women shouldered additional domestic care responsibilities compared to men, even in old age. Also, older women suffered ageing-related ailments such as arthritis, preventing them from frequent trips to the rooftops. This observation is consistent with many studies pointing out the deteriorating quality of life of older women in Trivandrum. For instance, a study by Rajasi et al. (2016) shows the specific unmet needs of older women, such as financial, physical, social and emotional assistance, causing poor quality of life. Likewise, in this study, there were fewer women gardeners than male gardeners due to ill health and care burdens.

2.11.4 Marital Status

Marital status is an important demographic variable as it indicates the general mental health of the population. Data on the gardeners' marital status help us explore the uptake and sustenance such as home gardening.

Table 2.6: Marital Status of Gardeners

Marital status	Frequency	Per cent
Married	145	96.67
Unmarried	2	1.33
Widow	2	0.33
Widower	1	0.67
Total	150	100

One can observe from *Table 2.6* above that married, unmarried, and widowed persons were involved in home gardening. This shows that the marital status of a person does not determine one's interest in home gardening. However, more than 90 per cent of the home gardeners were married. This shows that having a partner or a spouse can make the process more enjoyable and keep it going. Further, it may help in the division of gardening work, with each lending a helping hand when necessary. Also, the presence of two widowed and two unmarried gardeners indicates that gardening can give these groups a sense of purpose and accomplishment. It can become therapeutic for people who experience widowhood and provide an opportunity to connect with like-minded people who love plants.

2.11.5 Family Size and Type

In this research, family size refers to the number of members living in the household for at least a year before the study. Since the policy of grow bag distribution by the Kerala government aims to persuade households to grow vegetables sufficient for a family, it was essential to examine the size and type of family in which home gardeners in the city lived.

Table 2.7: Family Size of Gardeners

Family Size	Frequency	Per cent
1	3	2
2	63	42
3	29	19.33
4	37	24.66
5	11	7.33

6	7	4.66
Total	150	100

Table 2.7 shows that family size ranges from 1 to 6 in the present study. Regarding the family type, the study included nuclear and extended family types. Most (63) of the urban home gardeners lived in a two-member household, followed by those living in a four-member household (37). This finding is consistent with urbanisation trends in Kerala, marked by a decrease in household size and a rise in nuclear families. In the case of Thiruvananthapuram city, the average size of households reached 4.0 in 2011 (C. S. & Nair, 2018).

Table 2.8: Cross-tabulation of Age and Family Size

		Family Size						Total
		1	2	3	4	5	6	
Age	20-39	0	1	3	5	3	0	12
	40-59	2	16	15	20	4	3	60
	60-79	1	42	10	12	4	4	73
	80-99	1	3	1	0	0	0	5
Total		4	62	29	37	11	7	150

Besides, although elderly gardeners can be found in all household sizes ranging from 1-6, most (42) lived in a two-member household (**Table 2.8**). This is because most of these elderly gardeners were living with their spouses. At the same time, their children had moved out of the city either for education, employment (in the case of male offspring) or marriage, education and/or employment (in the case of female offspring). This trend of outward movement of youth from the state is a process that has increased since 1998 (Zacharia et al., (2003), cited in Rajan et al., 2020).

Table 2.9: Cross-tabulation of Family Size and Organic Market Participation

Family Size	Organic Markets				Total
	Krishi bhumi	Krishi Kutumbam	Krishibhumi and Kutumbam	Others	
1	2	0	0	0	2
2	10	5	0	2	17
3	5	2	0	0	7
4	4	3	2	2	11
5	2	0	2	0	4
6	2	0	0	0	2
Total	25	10	4	4	43

Further, the above *Table 2.9* shows that 17 out of the 43 gardeners who were members of organic markets came from a family of two. It is because, given that only two people lived at home, there is a limit to the self-consumption of garden produce. Thus, reduced family size can support home gardeners' participation in organic marketing groups.

2.11.6 Education

The educational status of gardeners gives a glimpse of the attitudes and awareness towards methods and practices of organic gardening as propagated by the State's policy and scientific community. The following *Table 2.10* gives a glimpse into the educational status of various gardeners in this study.

Table 2.10: Educational Attainment of Gardeners

Education	Frequency	Per cent
Secondary	7	4.7
Higher Secondary	5	3.3
Diploma	4	2.7
Undergraduate	88	58.7
Postgraduate	35	23.3
PhD	11	7.3
Total	150	100

By 1971, 76% of Kerala's urban population was literate (Nag, 1988). The educational qualification of all urban home gardeners in the present study ranges from secondary schooling to PhD, indicating that all of them had completed a minimum of ten years of formal school education. Besides, more than fifty per cent of organic gardeners were undergraduates. The educational background of gardeners shows specialisation in many fields such as commerce, arts (economics, commerce), humanities (literature), sciences (chemistry, zoology and botany), and social sciences. Besides, some gardeners were qualified in professional courses such as agricultural sciences, law, and engineering.

Table 2.11: Cross-tabulation of Education Level and Gender

Education level	Gender		Total
	Male	Female	
Secondary	5	2	7
Higher Secondary	4	1	5
Diploma	1	3	4
Under Graduate	47	41	88
Post Graduate	17	18	35
PhD	8	3	11
Total	82	68	150

Table 2.11 above shows very little gender divide among undergraduate male and female gardeners. However, it is notable that women outperformed men at the postgraduate level. This is due to greater emphasis on rural, primary and female education during colonial and post-independence periods. Moreover, given the trend of emigration, in the 1970s, many men moved to Gulf countries seeking employment. This is not the case with women, who stayed back and had opportunities to continue their education. Those men who did not move to Gulf countries found employment in the public sector, especially in the secretariat, for which an undergraduate degree suffices.

Table 2.12: Cross-tabulation of Education Level and Age

Education Level	Age				Total
	20-39	40-59	60-79	80-99	
Secondary	0	2	5	0	7
Higher Secondary	0	2	3	0	5
Diploma	0	4	0	0	4
Undergraduate	10	31	44	3	88
Post Graduate	2	19	13	1	35
PhD	0	2	8	1	11
Total	12	60	73	5	150

An examination of education according to age (**Table 2.12**) reveals that the age cohort (60-79) contains the most significant number of undergraduates (44), whereas the middle age group (40-59) contains the most significant number of post-graduates (19). Thus, the frequency of low education was more in the elderly group. However, the age cohort (60-79), i.e., elderly gardeners, includes 8 PhD holders too. This is because the study included experts such as agricultural officers and scientists. Most of these gardeners earned their PhDs in agricultural sciences from the Vellayani College of Agriculture, which was set up in Thiruvananthapuram as early as 1955. These agricultural scientists had taken to gardening post-retirement.

2.11.7 Employment Status

One's employment status indicates the ability to make time for engaging in home-based gardening activities.

Table 2.13: Employment Status of Gardeners

Employment	Frequency	Per cent
Homemakers	16	10.7
Retired	78	52
Working	56	37.3
Total	150	100

Table 2.13 shows that most home gardeners (52 per cent) were retired during the study. Gardening gives retired folks a purpose to spend their retirement time fruitfully. Besides, retired gardeners could spend more time than the working population tending to plants. Thirty-seven per cent of the gardeners were working population. This shows that having a full-time job does not hinder rooftop gardening. Further, it points out the increasing health consciousness among the working population due to media reports of food toxicity and policy measures such as grow bag distribution to city residents. Home-makers engaged in gardening were the least in number (16). This goes against the observation in many studies that home gardening is an activity engaged by homemakers, especially women. The decreased presence of homemakers in urban rooftop gardening could be because, although all the homemakers were women, they had little time to spare in gardening after attending to domestic responsibilities such as cooking, cleaning and family caretaking. Further, unlike backyard gardening, rooftop gardening requires regular resetting of soil in grow bags and at least two trips to the rooftop, all of which can often be tiring for a home-maker already burdened with other activities.

Table 2.14: Sector-wise Employment

Sector	Frequency	Per cent
Public	94	62.67
Private	21	14
Self	17	11.33
Homemaker	18	12

Total	150	100
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A sector-wise break-up of the employment status, as given in the *Table 2.14* above, shows that more than half (62 per cent) worked in the public sector. This is due to Thiruvananthapuram being the administrative capital, providing the gardeners with many opportunities for employment in bureaucratic offices such as the secretariat, Vikas Bhavan, and so on. There are also historical reasons, such as the efforts to promote education and social struggles to enter public service since the early twentieth century. This aligns with the district's current occupational profile, in which the tertiary sector dominates in providing employment (Census, 2011).

2.11.8 Income

Income is an important demographic variable indicating the material means at the hands of a population to lead a dignified and quality life. Further, it indicates the economic status of a community relative to others and its implication in terms of spending on one's health and well-being. The income demographic among the gardeners is summarized in the following *Table 2.15*.

Table 2.15: Monthly Income Range of Home Gardeners

Income	Frequency	Per cent
21-40	64	42.7
41-60	59	39.3
61-70	9	6.0
71-80	18	12.0
Total	150	100

Thanks to the gulf boom, and welfarist model emphasising primary health and education, Kerala's economic indicators, such as per capita income, are on par with many 'developed' countries. The per-capita income of Thiruvananthapuram was 1,29,137 rupees as of 2017 (Government of Kerala, 2017). Anthropologists have shown that in India, middle-class status is usually defined by having a secure job or stream of income (Kalb, 2014). More than half of the home gardeners in the city had a monthly income ranging between 21-40 thousand rupees, followed by those earning 41-60 rupees, indicating they fall under the urban-middle and upper-

middle class category. Urban gardening in the global south is often considered a means of food or income security for the urban poor. However, in this study, this activity is undertaken by middle-income groups. Studies have pointed out the “missing middle” in everyday environmentalist discourse (Mawdsley et al., 2009). The predominance of middle-income groups in this study can be attributed to the following. Given their educational attainments and media influence, they are aware of the health impacts of pesticide residue in food. Besides, on a day-to-day basis, they suffer socio-ecological problems associated with urbanisation in terms of pollution, waste, unsafe food, poor water quality, etc. Further, in this case, they are also targets of policy measures to promote self-sufficiency in vegetable production in the state.

2.11.9 House Type

House type is a material indication of the socioeconomic status of a population. The ability to own a home indicates a greater sense of freedom to engage in leisure pursuits such as gardening.

Table 2.16: House Type of Gardeners

House type	Frequency	Per cent
Own	147	98
Rent	3	2
Total	150	100

As can be seen in *Table 2.16*, ninety-eight per cent of gardeners in the city lived in their own homes, and only three lived in rented homes. This can be attributed to their economic status. As mentioned earlier, these gardeners were middle-income groups. Only three lived in rented homes. Tenancy often threatens urban gardening, with many owners hesitating to permit tenants to undertake rooftop gardening, fearing damage to their property. However, in this study, three gardeners living in rented homes engaged in rooftop gardening. This indicates that both the parties (the tenant gardener and the homeowner) appreciated the gardening process and had cordial relations with each other.

2.11.10 Terrace Size

The study focuses on exploring gardening practices in built structures such as rooftops, given the constraints of space in cities. Hence it examined the terrace size in terms of square feet to obtain an estimate of the average size of a rooftop home garden.

Table 2.17: Terrace Size

Terrace size(sq.ft)	Frequency	Per cent
100-500	43	28.7
500-1000	57	38
1000-1500	26	17.3
1500-2000	10	6.7
Above 2000	14	9.3
Total	150	100

From *Table 2.17* given above, it is clear that, on average, the rooftop garden has a size of 1108 square feet. Thirty-eight per cent of the home gardeners grew fruits and vegetables in less than 1000 sq ft. This is followed by 28 per cent of gardeners with a terrace size of less than 500 square feet. The latter indicates that the size of the terrace is not a constraint to take up rooftop gardening. Fourteen gardeners had a terrace size of more than 2000 square feet, indicating the preference among the urban population to use vacant rooftops for gardening purposes over other uses.

2.11.11 Duration of Gardening

Examining the duration of gardening indicates whether the practice has faded over time or gathered momentum.

Table 2.18: Duration of Gardening

Duration (in years)	Frequency	Per cent
1-5	81	54
6-10	34	22.67
11-15	16	10.67
16-20	8	5.33

21 and above	11	7.33
Total	150	100

Table 2.18 shows that most (81 out of 150) gardeners in the study were short-term gardeners (less than five years), followed by 23 per cent who had been growing for nearly a decade. This indicates that recent years have seen a massive uptake of this practice thanks to policy initiatives and mass media propaganda. However, the presence of eleven long-term gardeners (21 and above years) indicates that urban rooftop gardening is not new.

2.11.12 Garden Type

Although the study focuses on gardening in built structures such as rooftops, examining the garden type shows people's preferences and usage of urban home space for gardening.

Table 2.19: Garden Type

Garden Type	Frequency	Per cent
Rooftop	85	56.57
Both the rooftop and backyard	62	41.33
Rooftop, later backyard	3	2
Total	150	100

From **Table 2.19**, it is clear that most home gardeners used their rooftops for gardening. However, 62 gardeners used rooftops and backyards, indicating that people made the best use of all the space available for gardening. Further, three gardeners in the study moved from being rooftop to backyard gardeners indicating the fluidity of space usage by gardeners. This could be due to various reasons, such as terrace leakage and physical constraints in climbing rooftops (given that most gardeners were elderly), to name a few.

2.11.13 Livestock

Traditionally organic agriculture is based on animal labour and animal wastes as fertilisers. Although there are constraints to maintaining livestock in an urban setting, the study explored

whether urban gardeners had livestock, if any, given the dependency of organic agriculture on organic inputs.

Table 2.20: Livestock

Livestock	Frequency	Per cent
No	124	82.7
Yes	26	17.3
Total	150	100

The **Table 2.20** detailed above shows that most of the home gardeners (82 %) had no livestock. This is because of the spatial constraints in rearing and managing livestock in an urbanised set-up. Most gardeners lived on less than five cents of land, indicating the built area's limited extent. Nevertheless, 17 per cent of them raised livestock. This could be due to the settlement pattern in Kerala. Although the per capita land availability has decreased in urban areas, and high-rise apartments are emerging, the settlement pattern is predominated by independent houses, which allows some space around the built area for raising livestock such as poultry. Only three gardeners in the study raised hens on their rooftops, while the others had poultry sheds in the backyard. Among the livestock, Poultry comes first, with 12 people raising hens, followed by one rearing quails alongside hens. Three reported having had poultry earlier until street dogs attacked them. One urban gardener had a cow, goats and poultry, as she lived in her ancestral home with a huge backyard.

2.11.14 Religion and Caste

Religion and caste are indispensable socio-demographic variables indicating the social position of a population relative to others. The following tables indicate the religious and caste profile of urban home gardeners, respectively. It helps examine whether religion and caste play a role in contemporary home gardening practices.

Table 2.21: Religious Profile of the Gardeners

Religion	Frequency	Per cent
Hindu	120	80
Christian	21	14
Muslim	9	6

Total	150	100
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The above **Table 2.21** shows that gardening is pursued by people of all three major religious faith- Hinduism, Christianity, and Islam. However, most gardeners (80 per cent) were practising Hindus. This is due to two main reasons: the predominance of Hindus in the district's general population. For instance, Hindus constitute more than one-half of the population, i.e., 66.46 per cent (Census, 2011). Second, traditionally, Hindus and Christians in Travancore have been landowners/growers engaged in agricultural and plantation activities, whereas Muslims have primarily engaged in maritime trade. Further, the Muslim gardeners engaged in the study came from Kazhakootam, a ward which traditionally has had a concentration of Muslim population since the 1830s¹⁸. Christianity emphasises gardening as a way of environmental stewardship. In the present study, churches actively promoted gardening among their members. Two out of the 21 gardeners from the Christian community won prizes as part of the annual gardening competitions held in their church. Further, an agricultural officer who popularised vermicomposting for urban gardening in the city believed he was serving God. Thus, it can be observed that not only was gardening popular among followers of all the major religions in the city, but in some cases, religious beliefs and institutions added value to the process and recognition of the gardeners.

Table 2.22: Community Profile of Gardeners

Community	Frequency	Per cent
Not Revealed	72	48
Nair	59	39.33
Ezhava	9	6
Brahmin	6	4
Lingayat	1	0.66
Nadar	1	0.66
Catholic	1	0.66
Muslim	1	0.66
Total	150	100

¹⁸See <https://www.thehindu.com/society/history-and-culture/kazhakootam-and-karyavattam-were-home-to-people-following-different-customs-and-religions/article24592656.ece>

From the **Table 2.22**, it is clear that forty-eight per cent of the population did not respond to the researcher's inquiries about community background, as these gardeners believed gardening has no relationship to their social status. However, among those who responded, there is a predominance of Nairs (39 %), followed by Ezhavas (6 %). The increased representation of these communities can be because Nairs, as mentioned earlier, were traditionally land-owning, dominant communities of Thiruvananthapuram. They employed Ezhavas, the castes lower to them in the hierarchy, in their lands for cultivation of crops and coconut farming. Next to Nairs and Ezhavas came six gardeners from the Brahmin community. Traditionally, this caste engaged in priestly activities and the teaching of scriptures. In modern times, most of them take to teaching, banking and government service. Various reasons can be attributed to the participation of this community which traditionally did not involve agriculture. One is the need to engage in a healthy activity post-retirement. Most of the Tamil Brahmins were elderly, who took to gardening post-retirement. 4 out of six gardeners from this community resided in and around the Fort area, close to the city centre where institutions such as Krishibhavan, and Agro bazaars supplying grow bags, seeds and other equipment and promoting gardening activities were present. Second is the influence of media propaganda regarding pesticide residue and subsequent organic movement, which has caught their attention. Thirdly, two members of this community had spent a significant share of their childhood and adulthood outside Kerala, during which time they were exposed to gardening activities and nature visits. Thus, the participation of social groups other than Nair and Ezhavas point out factors such as retirement, location, social movements raising concerns regarding food safety and health, and particular life experiences which encourage people from traditionally non-agrarian communities to take up gardening. The survey shows that gardening is an activity spread across various caste groups within Hinduism (such as Nairs, Ezhavas, lingayats, and Tamil Brahmins), Christianity (Catholic Christians and Nadars), and Islam. It reflects the general multi-social structure of the district.

2.11.15 Migration

As mentioned in the city profile, Thiruvananthapuram is home to both intra-district and inter-district migrants who flock to the city in search of educational and employment opportunities. Hence, the present study examined the migration status of the gardeners as given below.

Table 2.23: Migration Status of Gardeners

Migration	Frequency	Per cent
Migrants	52	34.7
Native	98	65.3
Total	150	100

The above *Table 2.23* shows that most home gardeners (65%) were natives of Thiruvananthapuram. Migrant gardeners comprise 34 per cent of the gardeners. This includes both inter-district and intra-district migrants. It alludes to the character of Thiruvananthapuram as a centre for inter-district, followed by intra-state and inter-state emigration, as well as the preferred destination of returning Gulf migrants. For instance, 3 out of the 52 migrant home gardeners interviewed in the present study were returning emigrants whose native place was not Thiruvananthapuram but preferred it as a destination. Intra-district migrants had moved into the city from rural parts of the district for education and employment, whereas inter-district migrants came for employment.

2.11.16 Morbidity

The morbidity status of gardeners was examined in the study to reveal the prevalence of diseases and illnesses among the elderly gardening population and further examine its implications for home gardening, if any.

Table 2.24: Morbidity Status of Gardeners

Morbidity	Frequency	Per cent
Yes	61	40.7
No	89	59.3
Total	150	100

The above *Table 2.24* shows that more than half of the gardeners reported no morbidity. However, as seen from the table, the number of morbid gardeners is not far behind. Regardless of robust health care, educational achievement, and economic well-being, Kerala is today the

home to many lifestyle diseases, primarily diabetes, which has earned it the title of diabetes capital of India¹⁹.

Table 2.25: Cross-tabulation of Morbidity and Gender

Morbidity type	Male	Female	Total
Diabetes	8	6	14
Hypertension	5	3	8
Arthritic Diseases	4	7	11
Endocrine	0	4	4
Heart diseases	4	2	6
Total	21	22	43

The above **Table 2.25** lists major ailments suffered by gardeners. Accordingly, among the morbidities reported by gardeners, diabetes comes first, with 14 gardeners reporting diabetes. Further exploring a gender-wise distribution of diabetes revealed that 8 were men and 6 were women. Next to diabetes came arthritic ailments. In this case, more women than men reported various diseases of their joints such as osteoarthritis, spondylosis, back pain, weakness of limbs and so on. 8 gardeners reported suffering from hypertension, which included five men and three women. Thus, more men than women gardeners suffered from hypertension and diabetes. Only women suffered endocrine-related disorders such as thyroid disorders and uterine disorders. Of these, two gardeners had undergone uterus removal too. In the case of cardiac diseases, men outnumbered women. Overall, it can be concluded that women were more morbid than men, carrying multiple disease burdens. In addition to these morbidities, there was only one case of degenerative diseases, such as Parkinson's disease, reported by a male gardener. One of the gardeners in the study was also a breast cancer survivor, pointing to the rising cases of cancer in Kerala, especially breast cancer in women.

¹⁹ See <https://theprint.in/ani-press-releases/keralites-are-genetically-more-susceptible-to-diabetes-research-report-on-kerala-scenario-was-submitted-to-kerala-govt-and-authorities-on-world-diabetes-day/766371/>

2.12 Conclusion

The socio-economic and cultural profile of the city can be summed up as follows. The district has a varied geography, with the midlands better suited for agricultural activities. Its political history reveals it as a site of radical social reforms, especially the reformation of the caste system. The social fabric shows a multi-ethnic, multi-religious community. Its economic history reveals a subsistence economy with a tradition of homestead gardening until the 19th century and a predominantly agrarian economy until the 1970s. Today following urbanisation, only 4 per cent of the population in the city is involved in agriculture and cropping patterns have changed from paddy to plantation crops like rubber. However, through the public garden-zoo complex at the city centre instituted in colonial times, the gardening culture is kept alive in public memory. Many aspects of the district's profile match that of the profile of the urban gardeners. For instance, the social profile of urban gardeners is also multi-caste and multi-religious. Economically, most were involved in non-agricultural activities, in tune with the changed economic situation in the district and state since the 1970s. The demographic features of the city in terms of a rising ageing population are also reflected in the gardener's profile. Most of the gardeners were aged above 60 years. The majority of them lived with their spouse in a two-member household. Their economic status corresponds to the middle-income category. Their educational status ranges from secondary schooling to higher qualifications such as a PhD. Their social status indicates that most are Hindu Nairs, the erstwhile agrarian communities in the district. Most gardeners were natives of the district. Among migrant gardeners, there are intra and inter-district migrants. Although many gardeners perceived themselves as healthy, the elderly gardeners suffered from significant lifestyle diseases such as diabetes, hypertension and cardiac diseases. Overall, women gardeners were more morbid than male gardeners. Furthermore, although most of them were rooftop gardeners, the average size of a garden being thousand square feet. It is notable that although most of them were rooftop gardeners, forty per cent used both rooftop and backyard spaces for gardening indicating maximum usage of the available space wherever possible.

Chapter 3

Multiple Meanings of Rooftop Gardening Amidst Multiple Precarity: Perspectives of Various Actors

“Precarity once seemed the fate of the less fortunate. Now it seems that all our lives are precarious— even when, for the moment, our pockets are lined” - (Tsing, 2015, p. 2).

Meaning-making is an essential aspect of any social practice. When multiple actors are involved, various meanings are likely to emerge. Through the lens of multiple actors, such as the state, scientific community, environmental activists, and elderly gardeners, this chapter explores the diverse meanings these actors create and attach to urban home gardening. Further, it tries to highlight the precarious conditions against the backdrop of which these meanings emerge. Precarity is often associated with unstable employment and income insecurity often experienced by marginalized sections. However, as outlined in the previous chapter, the socio-economic profile of the city and the urban home gardeners indicates that Thiruvananthapuram is one of the economically advanced cities in India and most of the home gardeners belong to a secure income group. An examination of the meanings they give to urban gardening indicates the various precarities that this society endures, against which context gardening becomes meaningful practice. As a result, “urban precarity emerges as a multifaceted condition, encapsulating not only legal and economic deprivation but also moral, political, spiritual and health related uncertainties” (Campbell & Laheij, 2021, p.1).

3.1 Governmental Goals: Self-Sufficiency, Food Safety, Waste Management

Although Kerala requires 30 lakh tonnes of vegetables annually, it produces only 40 per cent while importing the remaining from its neighbouring states of Karnataka and Tamil Nadu (Suchitra, 2015). Moreover, due to the decline of traditional varieties of food crops in the state, biodiversity loss and pollution of soil, water following the Green Revolution, there have been calls for sustainable alternatives such as organic farming. One of the strategies of the Kerala State Organic Farming Policy formulated in 2010 was ‘*Jaiva (organic) Keralam (Kerala)*’, a popular movement to convert the state to organic farming through widespread campaigns. Two essential components of this movement were: a) promoting public awareness through popular media, especially among women b) encouraging and assisting urban and rural households to

set up organic kitchen gardens²⁰. Two years later, in its 12th five-year plan, the State government declared its primary goal concerning the agricultural sector as “Self-sufficiency in vegetable production to about 60% in the plan period (2012-2017)” (State Planning Board, 2013, p. 8). At the same time, regarding urban development, the State envisaged completing five solid waste management schemes. A third aspect of the plan was setting up a pesticide residue testing lab “to analyze pesticide residue in farm products and fruits and vegetables, etc., arriving in the market” (State Planning Board, 2013, p. 34).

Accordingly, in 2013, the Pesticide Research and Residue Lab was set up at Vellayani College of Agriculture in Thiruvananthapuram City. The agricultural department and the agricultural scientists entered a project titled ‘*Production and marketing of safe to eat vegetables for sale through government outlets*’²¹. It is a government-funded project to collect fruit and vegetable samples from open markets and test them for the presence of pesticide residues, following which communicate the test results to public and thereby generate awareness and support food safety (Kerala Agricultural University, 2013). Since 2013 the Kerala Agricultural University has been releasing reports of pesticide residue analysis every three months. The mass media widely popularise these from time to time. The year 2015 was significant in this respect because that year the media reported that the Government of Kerala had written to the officials in Tamil Nadu, raising the problem of alarming levels of pesticide residue in vegetables from the State. This followed a visit by Kerala’s food safety team to the farmlands in nine districts of Tamil Nadu²². During my fieldwork in 2019, the State government had moved into the 13th five-year plan period (2017-2022). In the thirteenth five-year plan, the government launched the ‘Haritha Keralam’²³ mission to build a sustainable, clean Kerala. Once again, the focus was on two areas: vegetable development and waste management. The policy stated, “We shall aim to attain self-sufficiency in vegetable production and augment vegetable cultivation to 1.05 lakh ha in a phased manner. It is also aimed to establish vegetable producer companies, promote rain shelter

²⁰See <https://ofai.org/wp-content/uploads/2010/05/Kerala-Organic-Farming-Policy1.PDF>

²¹See <https://www.deccanchronicle.com/nation/current-affairs/030118/main-pesticide-lab-in-kerala-remains-low-key.html>

²² See <https://www.hindustantimes.com/india/mind-your-veggies-kerala-complains-to-tamil-nadu-of-pesticide-residue/story-4jblbPRANe8WHJ6LWMDpjl.html>

²³ See <https://www.thehindu.com/news/cities/Thiruvananthapuram/Haritha-Keralam-project-in-mission-mode/article14991174.ece>

cultivation, and promote growing vegetables in mini poly houses in urban areas and apartments” (State Planning Board, 2018, p. 22). Regarding solid waste disposal, the policy emphasised “changing the consciousness of people” (State Planning Board, 2018, p. 41) to prevent littering in public places and persuade them to undertake source-based waste management.

The Department of Agriculture implemented the policy through its annual plans. Thus, over the past decade, it supported homestead and rooftop vegetable growing by supplying grow bags and micro-irrigation facilities such as family drip irrigation schemes to conserve water. Also, the State began integrating waste management with food production. For instance, the Annual Plan of the State Department of Agriculture and Farmers Welfare stated, “Out of ₹ 850.00 lakh earmarked for urban clusters ₹75.00 lakhs are set apart for waste management in urban clusters using tested and sustainable models in vermicompost and bio-waste utilisation linked to vegetable production in corporation areas” (State Planning Board, 2019, p.5).

Thus, in the past decade, the State promoted urban home gardening and urban household waste management in response to the three precarious situations of dependency on other states for vegetables, risks due to pesticide residue, and issues of waste disposal in the city. The following section explores how officials such as agricultural officers and agri-scientists look at food safety, organic movement, and urban gardening.

3.2 Inside the Pesticide Research and Residue Laboratory

In a risk society, technological experts are given a key position to determine the nature and levels of harm in risk discourse (Beck, 1992). As mentioned earlier, the government set up the pesticide research and residue laboratory at the Vellayani College of Agriculture in Thiruvananthapuram in 2013 to test the presence of harmful chemicals in fruits and vegetables consumed in the state and alert the public by publishing the reports of analysis every three months. Riya²⁴, a researcher in plant pathology working at the lab, explained the process of residue analysis as follows. Every year, 75 samples of fruits and vegetables weighing one kilogram each are randomly collected from open markets, eco shops, and private organic markets across each of the fourteen districts of the state. She adds that, earlier, collecting and testing samples every month was mandatory in the case of Kasargod district (a district in

²⁴ Respondents’ names are changed to protect their identity.

northern Kerala which was severely impacted by the indiscriminate use of a chemical called Endosulfan). Also, the sample count was initially 100 from each district, which has now been reduced to 75. The collected samples are then ground into a fine paste and then coded. Following this, 15 grams of the paste is taken to the wet lab, where using chemicals such as Acetonitrile, sodium chloride and magnesium sulphate, pesticide residue is extracted from it. The sample is tested for synthetic organophosphates and neo-nicotinoids using gas and liquid chromatography methods. It takes five hours to obtain the results. If it is found that the residue from a fruit or vegetable sample exceeds the maximum limit fixed by the Food Safety and Standards Authority of India, then it is considered unsafe. Those samples which contain residues within the boundary are deemed 'safe to eat' vegetables. Every pesticide has a waiting period: the time it takes to degrade naturally. She stated that at the farm level, food safety could be ensured if farmers take care to harvest after the recommended waiting period for each pesticide. Riya further alleged that farmers apply pesticides at various stages, not just in the field. For instance, she said many retailers spray pesticides against store pests during storage to protect the vegetable or fruit from decay. According to her, farmers' and retailers' neglect or lack of awareness often results in persistent chemicals in fruits and vegetables. She added that pesticides are not a homogenous category. There are blue, green, yellow and red labelled pesticides according to the degree of their toxic effect.

Riya's statements reflect that chemical pesticide use is inevitable, and so long as they are within certain scientifically prescribed acceptable limits, there is no cause to worry. However, as Beck (1992) argues,

Acceptable values may indeed prevent the very worst from happening, but they are at the same time 'blank checks' to poison nature and humankind a bit. How big this 'bit' can be is what is at stake here. The question (is) of whether plants, animals and people can withstand a large or a small bit of toxin, and how large a bit, and what 'withstand' means in this context. (p. 65)

It is this last question that is left unanswered by these agricultural experts.

3.3 The Role of Kudappanakunnu Krishi Bhavan and its Karma Sena

Krishi Bhavans are the local offices of the Department of Agriculture that act as nodal agencies distributing grow bags and other inputs for rooftop gardening in the city. There are eleven Krishi bhavans in Thiruvananthapuram. Out of these, the Kudappanakunnu Krishibhavan pioneered grow bag gardening in the city in 2009. The gardening residents of Kudappanakunnu (a hilly area in Thiruvananthapuram city) fondly remember the then agricultural officers, Vinu and Lini, who were at the forefront of promoting urban gardening. When I met Mr Vinu, he had been transferred to another Krishi Bhavan. Following is an excerpt from an interview with Vinu. He outlines the problems facing the agricultural sector and the circumstances that led to promoting grow bag gardening in the city.

Vinu

In an interview with him, Vinu first began with the urbanisation and transformation of Kudappanakunnu, which until recently was a panchayath (village area). He recalled, “As the civil station came up in Kudappanakunnu, land value increased. As a result, people began selling their land. Agriculture no longer seemed profitable. Agri labourers were no longer available. In this scenario, we mooted the idea of *Karma Sena* (workforce) to provide labour and technical assistance to farmers and reclaim unused agricultural lands. We recruited and trained people in input production, mechanisation, and scientific farming. Initially, we floated an advertisement that sought *agri labourers for farming*. No one turned up. This shows the disenchantment of youth towards agriculture and the poor social status associated with working as a farm labourer. Later, we modified the advertisement by stating, *looking for agricultural technicians*. Eighteen men turned up this time. Perhaps changing the name from farm labourer to farm technician earned the job social respect like that of a white-collar job. Of the 18 men that turned up for the training, eight remained. We undertook projects in and around Kudappanakunnu. Around the same time, agricultural college professors began studying and reporting pesticide residue in vegetables consumed in the state. The media played a great role in spreading awareness. Self-sufficiency in vegetable production became the only sustainable solution to address the problem of pesticide residue in vegetables imported from neighbouring states. The government began mooted for home gardening. Thus, although originally set up to address the labour shortage in farmlands, through the home gardening movement, *Karshika Karma Sena* could extend its services to city gardeners in terms of providing labour support to

set up grow bags on their rooftops.” Vinu further said, “In cities, people have little space in the backyard. Also, given water scarcity in the city, grow bags seemed the apt model for gardening, as it requires less water. In 2009 Kudappanakunnu Gram Panchayath launched a project of distributing 25 grow bags at a total cost of 1500 rupees with a 50% subsidy. This model of urban agriculture was first exhibited at the inauguration of Pothencode Santhigiri Ashram. Our model also included a provision for solar-powered biogas plants and poultry growing. Kitchen waste would be fed to hens; in turn, the poultry waste and other household waste would be fed into the biogas plant, the slurry from which would be used to grow plants in grow bags. Soon the State Horticulture Mission (SHM) organised a fest in the city. We exhibited our model there too. The then APC (Agriculture Production Commissioner) scaled it up by asking the State Horticulture Mission (SHM) to freely supply grow bags to 20000 households in the city in the first stage. In turn, they roped in four agencies: Kerala Agro Industries Corporation, Regional Agro Industrial Development Co-operative Ltd. (RAIDCO), TAB Agri-Systems and *Karma Sena* of Kudappanakunnu. *Karma Sena* began with a staff strength of 8; by the time this project scaled up, we had recruited up to 150 members. With the success of *Karma Sena* in Thiruvananthapuram, more *Karma Senas* were set up across the state—this employed youth as farm technicians. In the second stage, we supplied grow bags at 500 rupees, so the scheme only reached needy people. Seeing the success of SHM-led distribution, the Department of Agriculture took it up as part of the Vegetable Development Programme in 2012. Soon every Krishi Bhavan across the state became a grow bag distribution centre. At this stage, the city corporation launched the Haritha Nagaram (Green City) scheme. 11 Krishi Bhavans cater to the city corporation area. Under Haritha Nagaram, these 11 Krishi Bhavans became the points of distribution. Later new schemes came up. This time, out of the total cost of 22000 rupees, the beneficiary contribution was fixed at 7000 rupees. We supplied 40 grow bags with saplings (this time, saplings included bush pepper, turmeric, ginger, and curry leaves), biogas plants, and drip irrigation. Automated drip irrigation was launched to help migrant gardeners in the city, who would be away at their native places on weekends and holidays.”

From Vinu’s statements, the larger problems and precarities facing Kerala such as withdrawal of youth from agricultural sector, land use transformation, and so on, comes to the fore. This is reflected in his concern as an agricultural officer to save farming during rapid urbanisation and bring youth into agriculture, which is why he identified the need for labour support and set up the *Karma Sena* in the process. It can therefore be inferred that he looks at urban rooftop

gardening as a consequence of larger efforts on the part of agricultural officers like him to reclaim and revive agriculture, besides being best suited to urban areas, given space and resource constraints and rising concerns of food safety due to pesticide residues.

3.4 Rooftop Gardening: An Elite Culture

Six agricultural officers were interviewed in the study. Most of them viewed urban gardening as an elite culture, which does not address the problem of self-sufficiency or the danger of urban food insecurity. The following narratives of a few agricultural officials will show why it is an elite culture. Sunil (35 years), the current agricultural assistant at Kudappanakunnu Krishi Bhavan, has the following views on urban agriculture and urban home gardening.

Sunil

“The choices we took and changes we made to our environment have affected agriculture in Kerala. I was born in Vidura, *nattumpuram* (a rural area), on the way to Ponmudy hills in the district. I remember when I was five years old, I would play with friends around *plaavu* (jack trees), *maavu* (mango tree), *pulinjikka*, and *perakka* (guava). We had around us most plants and vegetables that we needed. After playing cricket, we would pick jackfruit and share it amongst ourselves, roasting its seeds. Today, we read articles explaining the anti-cancerous properties of jackfruit. Earlier, there were very few houses and many people living in them, with many trees around. Nowadays we have cut down trees to make space for big homes but at best one person or two living in them. Our lifestyle choices have changed. In the name of development, we have converted seemingly wastelands, seasonal lakes, and channels for other uses. In the nineties, people began cultivating cash crops like rubber. I think we should anticipate a drought in the coming years. Take the case of this Kudappanakunnu. It was a panchayat area until five years ago. Due to urban expansion, it has become part of the Trivandrum Municipal Corporation. Cities depend on rural areas for food requirements; however, agriculture is decreasing in rural areas. Thus, urban areas can no longer rely solely on rural areas for food security. The gap is filled temporarily by importing from neighbouring states.”

“Meanwhile, governments are exploring prospects for urban areas to become self-sufficient in producing safe food. Another massive problem in the cities is waste management, especially kitchen waste management. We are trying to integrate waste management with *jaiva* (organic)

Krishi (farming). For instance, Kudappanakunnu Krishi Bhavan handles 80% of the kitchen aerobic compost bin distribution in the city.

Beyond rooftop cultivation, at the macro level, initiatives are being taken. There are unused lands in and around institutions, both private and public. For instance, at the Travancore Titanium campus, where 80 per cent of land remains vacant, we experimented with waste management through organic farming. We dug a trench and filled it with the city's organic waste collected by the Thiruvananthapuram Municipal Corporation (TMC) and processed by an aerobic composting method using coir pith (70%) and inoculum. On top of that, we added soil. We encouraged pollination by planting *jamanthi* (orange chrysanthemum) and other flower plants that attract natural enemies of pests, thereby restoring the hitherto disturbed balance in the ecosystem. As a result, the need to use too many pesticides is reduced. Plant growth was commendable. When we consulted a scientist about our observation, he asked us to check the organic carbon content in the soil. According to him, if it is found to be more than 1%, organic farming can be marked as a success. We need more studies on how households use kitchen bins to compost household waste. Scientifically managed waste can be channelised into organic and high-quality food production. It solves the twin problems of food safety and urban organic waste management. The titanium case is a testimony to that”, says Sunil.

He states, “Most people postpone waste management in their busy lifestyle. The TMC has a Green Army engaged in collecting and segregating household waste. Another important aspect of urban lifestyle is the loss of mental peace due to hectic schedules. Beyond food, urban agriculture can provide mental happiness and recreation.

In my observation, only 20% of people engaged in rooftop gardening take self-sufficiency seriously. The remaining do it for mental happiness and health. We must introduce the latest efficient technology and proper monitoring system to persuade them to adopt agriculture. SHG (self-help groups), farmer collectives, and *Karma Sena* can play a major role. *Karma Sena* acts as a technical support to urban agriculture. Also, people in Kerala have a basic understanding of agriculture. They must tailor it to the micro-level (terrace/grow bag gardening). Besides, in cities, people have built their homes with so much care that they want to avoid setting up any garden that would distort the beauty (aesthetics) or safety of their beautifully built home and social status. Hence, we must set their garden in a manner that buttresses their dwelling in front of society. For instance, when someone sought my help to set up a climbing support for creeper

varieties like salad cucumber, bitter gourd, and so on, we let it climb along their cemented fence while concealing the cement at the same time”.

Being acquainted with the Krishi Bhoomi (city organic gardeners’ group), Sunil says that he sees them taking great pride in their activity and earning social status through their organic gardening practice. However, he argues, “If you look deeply enough, you will find their yield in percentage terms is fifty per cent or less. Thus, the problem of food security is addressed only up to 20 % or even less through rooftop gardening. At best, such initiatives' success lies in their message to society: ‘agriculture is a successful venture’, besides the joy and recreation they experience as part of the gardening collective. If food self-sufficiency, defined as building a system to produce all the food that one state needs, is our focus, then more than terrace gardening is needed, as it does not give yield. It is not the individual we must boost; we must increase food security. Terrace gardening is neither a source of livelihood nor a means to food security. Many people consider it a shame to their social status to sell the meagre yield from terrace gardening at Krishi Bhavan run eco shops. That it is a status-oriented endeavour is evident from the kind of exotic varieties of fruits and vegetables found in terrace gardens, say, for instance, grapes, strawberries, Chinese orange (looks like a small lemon, but tastes like orange), *chayamansa* (a popular anti-diabetic, Mexican variety of spinach), and so on which are neither suitable to our weather or ecology nor part of our diet. What is the point of going after ‘Chinese oranges? Why waste space by growing these when we can grow vegetables for making our *thoran*, *aviyal* (local cuisine made of vegetables and coconut), and so on? The most dangerous part is that many exotic varieties are sold as having medicinal value, which is invalid in many cases. It is all a desperate attempt to grow anything that catches their eye in nurseries and everything propagated by the global food culture and media, coupled with the problems or fears of chronic lifestyle diseases.”

Thus, by highlighting cases of macro initiatives undertaken by his team, such as the titanium campus organic gardening, and city-wide kitchen waste composting bins, Sunil urges the need for large-scale enterprises, technological innovations, and monitoring as the need of the hour when it comes to addressing problems of urban food security and self-sufficiency. Micro-interventions such as rooftop gardening cannot solve these pressing issues. In his view, these are a hobby pursued by the elite for pleasure and to add beauty to their homes. Besides, he is critical of their crop choice, which includes exotic fruits and vegetables, and hopes that they would cultivate local vegetables instead.

Like Sunil, another respondent, Mr George, a retired agricultural officer too lamented the loss of agricultural heritage in the state thanks to urbanization and changing attitudes of people.

George

Eighty-year-old George says, “If you may have noticed, in Western countries, a home is not complete without a garden; horticulture is part of their lifestyle, even among people living in suburban areas. They have a garden as part of their home, and gardening is a family activity. Here, on the contrary, people show off their wealth by renovating their homes, often by cutting down trees in their backyards. Thanks to their heritage, people in Kerala have a basic understanding of agriculture; but in cities, they are no longer prepared to engage in this activity. When American sanctions threatened Cuba's food security, they had to turn to urban agriculture. Likewise, if pushed to such a pitiable condition, we may all take up farming or urban gardening. Our goal is not to let things worsen to that extent. During 2012-13, people were highly drawn to urban home gardening. Over time, people move away from using grow bags to mud pots for various reasons, mainly fear of plastic disposal and terrace leakage issues. *Krishni parayan elupam, cheyan paadu* (agriculture is easy to preach, difficult to practice)”.

Thus, according to George, rooftop gardening was a trending fashion that started waning over time for a while. George, like Sunil, points to the hesitance of city people to take up farming. Instead, they often do the opposite, cutting down trees and building big mansions. Sneha, another agricultural officer too points out to the elite nature of rooftop gardening.

Sneha

Sneha has been working at the Palayam Krishi Bhavan as an agricultural assistant for six months now, and she oversees the distribution of grow bags to city gardeners. In her words, “Rooftop gardening has become a fashion and a status symbol for people, especially urban upper-class women; this is evident from how many people discontinued it after a few years. There is a rising awareness of pesticide residue in food, even among the younger generation. Nevertheless, people are too lazy to grow their own food. Instead, they are after supermarkets selling fake products in the name of organic. People have to be educated on the importance of growing a few vegetables for themselves. Often those that are engaged in gardening are lazy in terms of care practices. There is only so much that governments can do. At the most, we can bring grow bags fully fertilised with soil and seedlings to your rooftop. The rest is upon the interest and willingness of the gardener”.

Sneha therefore alleges the laidback attitude of city folks and carelessness in tending to plants as some of the problems affecting the success of initiatives like organic rooftop gardening.

From the narratives of the three agricultural officers, it is clear that they are skeptical about the sustainability of urban home gardening, given its elite appeal in terms of leisure activity, choice of exotic crops, the attitudinal problems of urban folks and so on.

3.5 Lessons from the Green Revolution

One of the features of the green revolution is the use of industrial chemicals and pesticides in place of organic inputs. While many of the agricultural scientists interviewed in this study acknowledged the ecological impact of excessive pesticide and fertilizer use, they expressed scepticism with respect to the complete transition into organic cultivation. Further, each of them had suggestions to offer based on their experience, as given below.

For instance, Rekha, a retired agricultural professor, says, “on a commercial level, organic cultivation is difficult, but at a small scale, it is possible. Judicious use of proper chemicals is the way forward. However, farmers continue to spray systemic pesticides to retain the aesthetic freshness of crops like spinach even the day before selling them. Systemic chemicals must not be sprayed at later stages of growth. I hope you know about the pesticide residue in vegetables from the neighbouring states of Karnataka and Tamil Nadu. Not just the farmers in those states, our own farmers act according to their whims with respect to fertiliser and pesticide application. Despite my advice to apply 2 ml per litre, farmers add excessive amounts to kill pests. They assume that pests must die immediately and fail to realise that some insecticides have a knockdown effect.

I think kitchen and terrace gardening can go 100 per cent organic. However, large-scale production requires at least 40 per cent use of chemical fertilisers and pesticides (green labelled ones) applied in the right doses with full awareness of the waiting period. Once the media brought attention to the excessive spraying of banned pesticides on vegetables, the consumers in Kerala had to shake away their laziness and start doing something in their capacity. Despite this awareness, people are too lazy to put in the effort. For the past twenty years, thanks to the Kerala Agricultural University (KAU) team’s continuous training of homemakers across the state through various means, including sharing recipes and letting people taste them, the importance of home-based mushroom and vegetable gardening is now widely known. I believe urban homemakers can make the best use of their leisure time by engaging in such pursuits.

It can be concluded that, as an agricultural scientist, Rekha believes the state can only become partially organic as commercial cultivation requires judicious use of industrial chemicals,

whereas small-scale farming, such as home-based rooftop gardening, can rely entirely on organic inputs. She attributes the ecological and health problems to the unscientific practice of conventional farmers (producers) and a lackadaisical approach on the part of urban consumers despite awareness of these practices. Likewise, eighty-three years old Paul, a retired agricultural scientist Paul shares his view as follows.

Paul

“In the book *History of Agriculture*, there is an excerpt of a letter written by one of the agents of the British East India Company about Kerala. He wrote, ‘Here I do not see any culture except agriculture’. Besides, the Royal Famine Commission Report mentioned homestead farming, fencing, cattle sheds, and so on, on the Malabar coast and remarked that it is comparable to that found in Rothamsted, UK. In recent times, the transformation of farming into a business was one of the setbacks for agriculture in India. From the 1960s, pesticide use intensified. When I studied agriculture in 1955, the popular conception was that these are safe. The information about their side effects was lacking. Two influential groups of crop protection chemicals, such as insecticides and fungicides, were initially formulated to control the diseases that affected soldiers fighting world wars. Gradually they found their way to agriculture. Probably in the 1960s, American writer Rachel Carson raised the issue of biomagnification and bioaccumulation due to pesticides and insecticides such as DDT (Deoxy Dichloro Trichloro Ethane) in her book *Silent Spring*. Unfortunately, it is said that she died of cancer.

As the developed countries began reducing the usage of pesticides, developing countries were reeling under famine. I remember facing food shortages in my childhood. From the 1930s onwards, famine was frequent. Crop scientists began researching high-yielding varieties by breeding. Native plants and animals developed resistance over the years through genetic improvement. If you notice, morbidity and mortality are lower among Adivasis (indigenous people) due to their natural resistance. Once they became part of the mainstream, they began to suffer. Likewise, as part of the green revolution, the crossing of exotic plants with native plants happened, and gradually the offspring lost resistance. The same is the case with cattle too.

As cultivation intensified and plants and animals lost resistance, people used more insecticides and pesticides to maintain yield. Over time, people became aware of the health impacts of pesticide residue in food. As purchasing power increased, people could now afford better-quality food. Meanwhile, living space is reduced. Hence, ecological, economic, educational, and demographic factors determined the recent trend towards organic farming. Yet it is

practised only in limited areas, as we need more adequate inputs for large-scale organic cultivation.

In 1977, I obtained a doctoral degree in Integrated Pest Management. Around that time, brown plant hoppers had become a menace to rice. I was posted in the Mankombu research station to work using Integrated Pest Management (IPM). It integrates mechanical, biological and chemical pest management techniques by reducing synthetic chemicals' use without losing to farmers. Earlier, we regularly used chemicals banned by other countries. We cannot entirely blame the government for prioritising food security in the olden days. Due to advances in science, people's awareness, and so on, things are changing slowly.

The more I learnt, the more I wanted to discourage insecticides. However, when I was working in Kuttanad, a man who cultivated paddy on leased land approached me with the problem of brown plant hopper infestation. Although applying insecticides on a crop nearing harvest was not advisable, he begged me to suggest some remedy, or else he would commit suicide. I searched for safer insecticides and told him to wash off the crops with water. Hence, there are limitations to how we can manage pests organically. As far as possible, I advocated IPM during my service years and limited chemical pesticide use unless necessary. Post retirement, I began growing vegetables organically at home when I came to Thiruvananthapuram. My son is in the United States of America. There, people spend summers gardening, and there are weekly farmers' markets. At Sunday's sermon in the Church, the priests persuade the community members to visit and encourage the local farmers' markets. In India, we have no such initiatives and fraudulent people are capitalising on the demand for organic products to sell fake products. We must develop a culture that respects farmers' efforts and society's right to have safe, healthy food. Initiatives like rooftop gardening, if taken seriously, can help practise organic agriculture on a tiny scale in cities."

Thus, Paul's life journey as an agricultural student studying the then popular conceptions of industrial pesticides, to a researcher working on integrated pest management and later an organic home gardener post-retirement shows the transformations in mainstream ideas of cultivation over time in the scientific community. While acknowledging the negative impacts of industrial chemicals, he justifies the decision of the policymakers to adopt the green revolution in the 1960s as inevitable, given the context of famine and food insecurity at that time. His scepticism with respect to the complete transformation to organic gardening is a result of his personal experiences of seeing the plight of conventional farmers and his concerns regarding the adequacy of organic inputs for large-scale cultivation. According to him, the recent turn to organic cultivation resulted from advances in scientific studies such as those

pioneered by Rachel Carson, a rise in people's economic status, education and awareness of the health impacts of excessive chemical use on the ecosystem, and so on. Like agricultural officer George, he states the scenario of developed countries like the USA to allege that very little is done in Kerala to promote organic gardening at the local level. Against this context, he situates rooftop organic gardening as an opportunity for urban households to practice organic cultivation on a small scale. However, it can't be scaled up or easily taken up by mainstream farmers.

The above cases show that the two scientists believed that it is impossible to succeed by only relying on organic farming techniques on a commercial level. However, they differed in their approaches to conventional farming, particularly on pest control. While Rekha believes in the judicious use of chemical pesticides, Paul, following his integrated pest management technique, advocates a combination of methods, of which reasonable use of synthetic chemicals is often advised as a last resort. Also, while both of them agreed that organic methods of cultivation could be a success at a small scale, such as home-based rooftop gardening, they uniformly alleged laziness on the part of the public to take up rooftop gardening.

3.6 Food Security Comes First, and Quality Next

Like the elderly retired scientist Paul, another retired agricultural official named Mathew argues that the primary goal of agriculture is to meet the needs of food security of the entire population. Much like the often-mentioned trade-off between pursuit of economic development and protection of the environment, Mathew prioritises food security over food quality. In the words of Mathew, "Officers like us have popularised the use of chemical fertilisers in agriculture". He justifies, "That was a necessity because we needed food security first. Now that we are secure in food production, we can move towards making quality food. The USSR was far advanced in every field compared to other nations, but that empire lost everything. The reason was food shortage. Their staple crop, wheat, failed due to a pest called wheat rust. As the USA closed all food supply channels to Russia and famine spread, internal conflicts ensued. The government became ineffective, and disintegration followed. Hence, food is the source of both happiness and conflict. Food security comes first, and quality next. If we have to follow a wholly organic way of life, we must give up fossil fuels, cars, and so on, which is not feasible. Hence, going organic is a utopian notion. Before the 1960s, there was a sufficient cattle population. Today humans are the most dominating species. Urea contains nitrogen for plant

growth, phosphorus for root, and potassium for flowering. Hence, alongside making organic fertiliser available, we must supply urea in adequate amounts to ensure food security. Our mind is no longer organic after the industrial revolution. Unless our mindset is organic, we can't cultivate organic food. In the past, we cultivated paddy in Kerala. We are no longer doing it now. When I entered the service in the 1970s, there were 15 lakh hectares of paddy land in Kerala. Now it is below four lakhs. The population has increased exponentially since then. Our staple food was paddy; its cultivation decreased to one-fourth.

Now tell me, how will we become fully organic? As a responsible agricultural official, I have to find a solution. I can't keep preaching, but I am forced to suggest using chemical fertilisers in addition to organic fertilisers, given the practical concerns. Therefore, the prospect of initiatives like terrace gardening or home-based gardening in this age of toxic environment, is to minimise poisonous intake, at least in daily vegetables. Air, water, soil; all are polluted today.”

He recalls, “Urban waste management was a concern for a long time. Later came the issue of pesticide residue in vegetables. As far as Kerala is concerned, land area is limited, and population density is high. The state has a political and economic advantage in recruiting workers to collect municipal waste. However, such measures end up in open dump yards on the city outskirts, with no sustainable waste management solution. In the 1960s, Thiruvananthapuram was a clean city. It had a well-established drainage system and sewage farms. As the town developed, it became impossible to manage waste. When does food become waste? The leftover food cooked at home turns untouchable after a few hours. If we are ready to manage our waste, we are no longer a liability to the community.

On the other hand, when we throw away waste or ask others to collect it, we entrust our responsibility to the community. We are quick to protest against improper waste management, but whose waste is it in the first place? Isn't it better to handle leftover food before it turns into garbage? Earlier, vermicomposting was a farm based on a large scale. I tried doing vermicomposting at home and popularised it. Today, the municipal corporation's kitchen waste management has expenses in terms of inoculum supply for biodegradation. However, earthworms are naturally occurring on the earth. We, humans, eat good food and eliminate waste; on the other hand, earthworms eat organic waste and eliminate nutrient-rich soil. Urban agriculture promotes greenery and food safety. When I grow food for my consumption, I won't use pesticides nor fret over small-sized, worm-stringed or insect-attacked vegetables or fruit. However, Malayali people have a pseudo-psychology lured by big-sized, attractively packaged

toxic food prepared for large-scale markets. We can't make organic food without organic inputs. Nowadays, the cattle population has dwindled.

Waste is, therefore, the best input that can be used. 'Waste can be converted into gold' was the title of my training class. The cost of centralized household waste collection per year amounts to 15000 rupees. Besides, transportation and socio-environmental costs make the whole waste management system inefficient and unhealthy. On the other hand, if we purchase 100 kg of vermicompost, we can make organic fertiliser of up to 250 kg. If we were to sell it at 50 rupees per kilo, we could earn up to 12500 rupees. Secondly, when we are around plants, we release carbon dioxide and take in oxygen from them. We have immeasurable advantages in preventing the young generation from the negative influence of social media such as WhatsApp and Facebook, as there is no more idle time to waste. Instead, we can channel their mind into positive, creative endeavours such as gardening."

In other words, according to Mathew, organic cultivation in general and rooftop gardening in particular cannot address the problem of food security nor can it solve the ground realities of pest attack. In his opinion, rather than a complete transition into organic, which he deems utopian, judicious uses of industrial fertilisers such as urea is the way forward as far as conventional farming is concerned. Mathew is more concerned with the long-standing problem of waste management in the city. It is in this area that urban rooftop gardening appeals to him as a means to effectively manage household waste by composting it into fertilizer for gardening. Consequently, people get to eat safe food to a small extent and are exposed to lesser toxins.

From the above account of official and scientific views, it can be inferred that in contrast to the lofty goals of the State such as becoming organic and self-sufficient, agricultural officers and scientists, point out multiple precarities facing the agricultural sector, and take a skeptical stance with respect to organic farming given the problems of scaling up to meet the food requirements of the entire population. They also express a preference for a mixed approach involving balanced use of chemical and organic inputs, integrated pest management methods and so on. To them urban home gardening is an elite hobby albeit with potential for organic cultivation on a small scale, household waste management if people are willing to put the efforts.

3.7 Through the Lens of Non-Governmental Organisations

Non-governmental organisations in the city have an important role to play in the organic movement in general and rooftop organic gardening movement in particular. In this study, Manoj, an environmental activist who runs an NGO in Thiruvananthapuram, was interviewed to obtain the activist's perspective on urban gardening in the city. He began with the history of the organic movement in Kerala. In his words:

Manoj

“In Kerala, the organic movement is quite old. It did not begin with correcting the food system but out of an environmental ethic. Organisations like ‘One Earth, One Life’²⁵ recognised the need to move towards natural farming. Alongside came books by Rachel Carson and Masanobu Fukuoka. In Kerala, we have a well-read community. Thus, these two authors contributed to the first level of environmental thinking among the people. That is how the seeds of organic farming and movement were sown. Then the Endosulfan²⁶ poisoning, a tragedy happened in Kasargod. It exposed Kerala's vulnerability to pesticide use. The Endosulfan movement was a major anti-pesticide movement in the nation. The movement gained momentum, with the state, media, and civil society stepping in. Thus, slowly a paradigm was being built. Every other day, the media began probing and highlighting indiscriminate pesticide use across the state and other states. They reported that food coming to our state from neighbouring states contained excessive pesticide residue. While, with all these efforts, we were trying to move out of pesticides, the State and the country came up with another problem, genetically modified (GM) crops. Our rallying cry in the anti- GM crops movement against Bt brinjal and so on was this: let's move natural and see how productivity fares and food security are still being met. However, thanks to the lobbying by the chemical fertiliser and pesticide industry, we struggled to phase out synthetic chemical use in agriculture completely. As awareness of pesticide residue spread, urban farming slowly picked up because, unlike conventional farmers who could move to organic farming, urbanites depend on the market. The latter have no clue where their vegetables come from, what they contain, and so on. Consequently, the government set up the Horti Corp to sell locally produced vegetables; however, due to corruption, it also contained toxic vegetables from Tamil Nadu at one point. Now things have changed. Another important

²⁵ A Non-Governmental Organisation working for environmental conservation.

²⁶Endosulphan is a chemical pesticide reported to have caused biodiversity loss, severe toxicity and developmental defects in the residents of a village in Kasargod (northern district of Kerala) following years of aerial spraying on cashew plantations in that area. In 2001 the state banned the pesticide following protests.

reason Trivandrum was a rooftop and home-based gardening pioneer was the rising problem of waste management in the city. The problem moved Mathew, an officer with the agricultural department, to introduce a project titled “*Nagarathil Oru Nattinpuram*”, meaning ‘a village in the city’. This project aimed to solve the twin problems of urban waste management and food safety. He contacted residential associations and schools, popularising source-based waste management using the resultant compost for gardening. His team advocated vermicomposting methods. He also set up vermicomposting rings. Some of these schemes are no longer implemented. In my son’s school, they started gardening and composting. It picked up many hopes. We also promoted it. That was the time when Vilappilsala (the city’s centralised model of waste disposal) failed. We, at our NGO, introduced pot composting and called them ‘compots’. Suddenly we got a system where we could compost our waste and grow our food. People took to grow bags gardening. Although we preferred pots over plastic grow bags, we promoted the process. We celebrated World Kitchen Garden Day. At the same time, Kudappanakunnu Krishi Bhavan set up an army of agricultural technicians called the *Karshika Karma Sena*. They transported and installed grow bags and allied drip irrigation tubes and prepared saplings, bio fertilisers and pesticides. Credit goes to the agricultural officers who popularised urban terrace gardening and Karma Sena. Soon, *Kudumbasree* (Self-help groups) were involved in fertiliser preparation, vermicomposting, etc. Let me tell you, Thiruvananthapuram has a craze for gardening. It is not as if the people in the city are new to farming. They were unaware of the latest technologies and knowledge required to do it in limited spaces and containers. Besides, they needed training in using biocontrol agents such as *Pseudomonas*, *Trichoderma*, and so on. Above all, they needed good quality seeds. Essentially people in Thiruvananthapuram have farming in their hearts. Efforts to address this need came from politicians like the then minister for agriculture. He was instrumental in setting up the Agro Super Bazaar in the city centre. The bazaar is a one-stop shop for all materials required for organic farming and gardening. They sell seeds, saplings, cow dung, coir pith compost, bone meal, neem cake, biopesticides, tools for gardening, drip and wick irrigation tubes, pots, grow bags etc. It became the low-cost, exclusively organic destination for city residents as the Department of Agriculture ran it.

Furthermore, some urban gardeners began growing paddy on the terrace. Some youngsters gave up their job to start farming full-time. Our NGO set up the oldest and purest organic bazaar from where citizens could purchase organic products. This way, we ensured fair prices for rural organic farmers and safe food for our customers. In the beginning, we also encouraged city

gardeners to contribute to our stock by bringing their home-grown vegetables and fruits after a quality assessment by our experts.”

Manoj’s narrative emphasises the collective role of media, state, agricultural officers and institutions such as schools and civil society organisations in making urban gardening a popular movement, unlike agri officials who emphasised the micro and elite nature of the process. Also, unlike the scientists, who are skeptical of the entire state becoming totally organic, citing concerns of scale, he believes it is possible to become organic beyond the confines of rooftop gardening. The following section looks at the perspectives of gardeners engaged in this process.

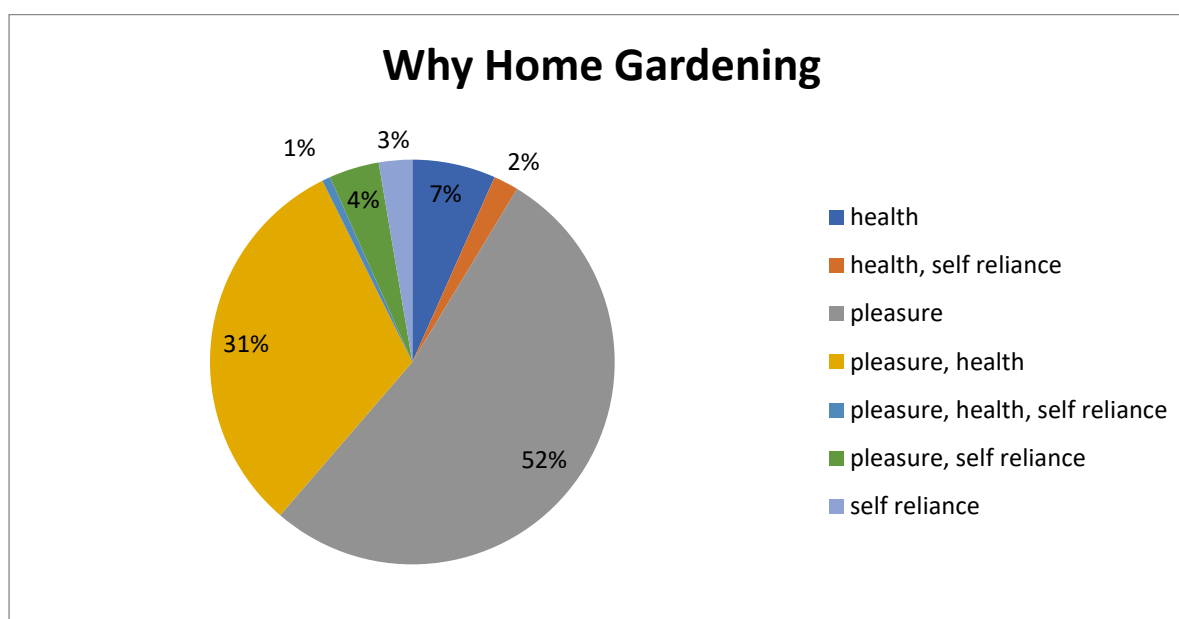
3.8 Gardener’s Perspectives

As mentioned earlier, the policy’s central focus was self-sufficiency in vegetable production. However, only four gardeners reported taking to rooftop gardening for self-reliance. Most home gardeners reported pleasure as the primary reason, followed by a combination of factors such as health and pleasure (see *Table 3.1* below). The following section details the contexts in which gardening emerges as a pleasurable and health-promoting endeavour.

Table 3.1: Reasons for Gardening

Reasons	Frequency (no.s)	Per cent (%)
Health	10	7
Health, self-reliance	3	2
Pleasure	79	52
Pleasure, Health	47	31
Pleasure, Health, Self-reliance	1	1
Pleasure, Self-reliance	6	4
Self -reliance	4	3
Total	150	100

Figure 3.1: Various Reasons for Home Gardening



Source: Fieldwork

3.8.1 Gardening as Pleasure

Visiting gardens and gardening are primarily pleasurable activities. Several studies have reported the sense of joy and wonder that plants evoke in human beings. For instance, Connel (2004) examining the motivations of garden visitors in Britains argues that it is “the purest of human pleasures” (Connel, 2004, p.229). Similarly, Hitchings (2003), exploring material pleasures of private gardens notes that “the individual aesthetic attractiveness of the plant itself, over and above its contribution to any wider artistic composition” (Hitchings, 2003, p.105) was fun enough for the gardeners in his study. Likewise, in this study, as seen in Figure 3.1, 52 % of the gardeners reported pleasure as the main reason for home gardening. The following narratives indicate how gardening is primarily a pleasurable activity for some of the urban gardeners in the study.

Subhash, a businessman and gardener says, “Gardening is a source of happiness. More than fruits, I am attracted to flowers. I love light colours, especially the flowers of the pea plants. Many people do not notice the flowers of edible plants in a rush to reap its fruits.” 60-year-old Rema, an elderly widow and avid gardener, asks, “Have you visited Peppara dam? Water supply to the city comes from there. When we visited Peppara, near Ponmudi, I picked a plant which bears violet flowers. It is a wildflower, but I loved it and brought it home.” Jyothi Lakshmi is a nurse and a long-term gardener. She says, “I have liked growing plants since

childhood. Long before the issue of pesticide residue in vegetables became popular, I had been maintaining a kitchen garden—*oru rasam* (a pleasure). In 2004, when the government started supplying grow bags, I first tried growing in the backyard, but it failed. Then I tiled the terrace and moved the bags to the terrace.” As we move past her plants on her rooftop, she pauses and exclaims, “Look, it is green peas. I dropped a few sprouted ones just for fun, and they grew. I had never seen what the green peas plant looked like. Now I got a chance.” Sixty-year-old Shyamala says, “Whenever I post photos of some of my plants in the WhatsApp group, many people ask for their seed or stem. It gives me great pleasure to share the seeds. That way, one plant becomes many and reaches many places from my home.”

Sheeba says, “Since 1995, I have been familiar with organic farming. We have been doing it since then. Only recently did people become more aware. We moved to Thiruvananthapuram five years ago. Time flies by when I go up to my terrace, and I have many birds as friends. Except for snakes, all animals and birds visit. I treat them as friends, so I do not bother myself with spraying *marunnu* (pesticides). If we use drip or wick irrigation, we no longer need to attend to them or see them daily; it creates a distance between our plants and us. We are engaged in this process for *manasika santhosham* (mental happiness), not for monetary gain. Hence, we are not interested in joining any marketing groups in the city, although we are aware of such initiatives. We cannot do anything for global climate change, but home gardening can be a grassroots initiative that people can take up, and it will make a difference in the long run. There are a variety of birds here thanks to our garden. Seeing the plants is happiness for them and us. Daily care is a mutually beneficial process.” According to 88-year-old Divakaran Pillai from Shasthamangalam, “For those willing to spend time, gardening is a fruitful hobby that gives happiness to the mind and maintains health while ageing. Along with health, watching the seeds we sow, grow and bear fruit gives *manassinu santhosham* (immense mental happiness). *Cheera valarnu nilkkunnathu* (spinach growing up), *mulaku kaickunnath* (chillies ripening), *vendapidichirukkunnath* (ladies’ finger catching up), *muringa thoongi nilkunnath* (drumstick hanging high in the air) *kaanan rasamanu* (all are a pleasure to watch).”

Radha Sharma, a working woman and long-term gardener, says, “Pesticide residue in food is not the only issue. I like gardening and have always been interested in gardening. Above all, it has to be organic when we do it on a small scale. Whenever I would hear news of the need to grow one's own food, I would feel happy that I am already engaged in doing the right thing. I had severe pain in my leg during the last rains and floods. I got dejected and declared I would not do it (terrace gardening), but somehow, I have started again! I find myself unable to resist gardening. When my colleague shares a few seeds or lists the plants in their garden, I feel sorry

about not having anything to share from my terrace.” Radhika Devi, another long-term gardener, says, “I love tending to flowers and gardens. It is what I like doing. I spend most of my time on the terrace, except when I need to pack lunch for my daughter as she leaves for duty in the morning. My daughter is equally interested in gardening. My son-in-law is also supportive. Whenever he visits us, he takes the whole family, including my little grandson, on a trip to Vellayani (local agricultural college), where we buy seeds and vegetables. Even if we occasionally eat from a restaurant, we regret it after returning.”

Eighty-year-old Parvathy says, “I was looking for *piranda* leaves because it was an ingredient of the traditional *appalam* (pappad) making process. In my childhood, I have seen my mother using the extract of *piranda* leaves while grinding the mixture for *appalam*. Once the mixture was prepared, the neighbouring women would join her to make balls out of the dough and spread them on a sheet on our rooftop. Kids would help with picking the papads once they are dry. In this way, one household's yearly *pappad* requirement was met with the help of neighbours. In turn, my mother helped them when they made their *pappads*. Once I spotted these leaves in the Silent Valley herbarium. I felt like picking one from there. I resisted the temptation and returned with a heavy heart. After a few months, I spotted it on the roadside. I picked it up, and it is growing on my terrace now. There are so many people like me who value old things. I am sentimentally attached to the *piranda* because it holds childhood memories of my mother with it, more than what I would make use of it.”

The above accounts indicate that many urbanites had already been gardening for a long time and for reasons other than growing pesticide-free food. The sheer pleasure of watching every stage of the plant growth, colours of flowers, the fun of experimenting, childhood memories associated with some plants, love for plants and consequent pleasure from tending to them, happiness from sharing seeds and so on are the reasons that keep many people hooked to rooftop gardening.

3.8.2 Gardening for Health

Besides being a source of pleasure, urban gardening is also a means to maintain health. Growing own food creates a sense of control over its quality for urban people who are otherwise at the mercy and risk of eating food from unknown sources, prey to life style diseases, and mental stress. In this study 47 gardeners reported gardening for both pleasure and health. Besides, 10 gardeners cited health as the sole reason for taking part in the activity. The following narratives illustrate the relationship between gardening and health.

Jyotish Kumar and Archana

Jyotish Kumar and his wife Archana are an ageing gardening couple living in the city centre. In the words of Jyotish Kumar, “Humans are greedy. Our selfishness is the root cause of all troubles. We are struggling thanks to us running behind comfort. For instance, in 1990, I was lured into building a big home. Today I regret having built such a huge home of 3200 square feet for two people to live in. We have exerted pressure on the earth in this house’s area and forgone so much greenery. Climate change is anthropogenic. In this city, only 30 per cent of the total land is lived in; the rest is an investment for real estate. When things reach a point where even necessities such as our food are contaminated, we are compelled to rethink many of our decisions. In my childhood, we ate good food. There were no chemical fertilisers or pesticides. I first came across urea only in the eighth grade. Before that, everyone used natural fertilisers such as cow dung, groundnut cake, ash, etc. We had fewer pests than we have today. We depended only on nature. Such a method of farming was 'natural farming'. Organic farming is a recently coined term. The inputs we use in organic farming, such as VAM (Vesicular Arbuscular Mycorrhiza), cultured in labs today, were available naturally in the soil until fifty years ago. Sadly, these naturally occurring microbes have died, due to excessive chemical use, not only in farming but also in household items, like detergents, etc. Another big reason for temperature rise is the use of fossil fuels. In my youth, the maximum temperature rise was around 31 degrees Celsius; today, that is not the case. Look at the rise in the number of vehicles on the road today. I myself own three cars; however, I have not bought another one for the past ten years. When my child was five years old, he would ride his bicycle on the road. Now there is no room for kids to cycle around. Even a fourth-class employee has higher purchasing power today, thanks to which they are buying cars. People do not want to buy bicycles anymore. People no longer engage in farming. Most women are glued to the television watching daily soaps. In essence, we have lost all the goodness, thanks to our own choices. We have to put in double the effort to revive what we have lost. But, thanks to rising cases of heart disease, diabetes, cholesterol, and cancer, there is a huge demand for organic foods. Many people who come to me asking for my products suffer from any one of the diseases mentioned above. In my opinion, food is medicine and vice-versa. We can avoid many other diseases if we look at food as a medicine. We readily took to sunflower oil. However, we know nothing about its constituents. We hear they are ‘doubly refined’, but no one knows the process. One hears rumours that the refining process involves petroleum products, whose presence we can’t detect. Instead, if we use coconut oil, cold pressed locally, we need not fear. In my youth, there was much poverty and food shortage. I remember crowds thronging on the birth anniversary of Sri

Narayana Guru (spiritual reformer) to get a bowl of rice porridge. Today, there is no dearth of food; instead, there is food waste. Thanks to the green revolution, we are now self-sufficient; however, we paid a heavy price for it by depending on chemical fertilisers and pesticides, thereby killing our soil. All chemicals are exothermic; they release heat and as a result, microbes in the soil die. We know that nature has a way of controlling population explosion, either through floods or other calamities. People have died of the plague. Perhaps this time, it is through diseases. If things go the way they are now, the next generation will be sick by the time they reach their thirties. Home gardening is an initiative for the future generation. It is an investment in their health. I do not buy many vegetables from the market except for rice and meat. I prefer homemade food over visiting a restaurant. As per reports, curry leaves and chillies contain the highest pesticide residue. The agriculture department is yet to support organic fully. They are sceptical of yields from organic farming. In my opinion, two things matter—first, the condition of the soil. Organic cultivation on virgin soil yields much more than conventional farming; however, if the soil is dead due to excessive chemical use, it may take a few years to deliver yield. In my experience, I got big-sized cauliflowers up to 1.5 kg on my virgin soil. Likewise, organic *Matti* (native variety) bananas weighed 27 kg, and Palayankodan bananas weighed 42 kg. Colour is a noticeable aspect of organically grown fruits. Organic products have rich colours.

My son's generation gets everything they want in no time. Everyone is after money. Only when they mature through life's bitter experiences will they think about things money can't buy, such as health. Also, today's youth are running after money without knowing how to live and use the money earned. The case of IT workers is well known. They work for hours together in front of a laptop, and by the age of thirty, they have diabetes; their BP is high, and they are full of back pain and mental stress. In return for sacrificing their psychological and physical health, they get money, which they will have to shell out to recover their health." "On the other hand," Archana, his wife, intervened, "I belong to a farming family in Ochira. I would wake up to the sound of workers feeding cattle every day. I got married by 19, and we moved into the city. My son's constant struggle with asthma made us conscious about health. My son and his wife are not very concerned about consuming organic food. However, my daughter-in-law's parents are very ardent gardeners."

Thus, Jyotish Kumar and his wife's healthier, quieter, more nature friendly past, although ridden with food shortage at times, contrasts with the precarious condition of the present we are living in. This precarity manifests in many ways—through rising cases of diseases, the risks to health from refined products, and mental and physical stresses brought on by changing forms

of work. The couple traces the cause of the deteriorating health of contemporary society to man's spiritual and moral failure as a greedy species. They critically reflect on the health cost of their own consumerist choices and see this trend only worsening over time. It is against this context that they see organic gardening as a health-reviving endeavour and an investment for the future generation's health.

In a similar vein to the narrative of Jyotish Kumar and his wife Archana, Jumaila, another elderly gardener, adds, "In my childhood, we ate only locally produced vegetables. Only in the last few decades did we begin importing vegetables from other states, such as Tamil Nadu. These days, vegetables and fruits have become 'toxic' vegetables. We can see for ourselves that the health of this generation is deteriorating; much of the reason can be attributed to our lifestyle and eating habits. I do not use market-based curry powders such as sambar, rasam powder, etc. I buy the ingredients such as pulses, chillies, jeera, and coriander, clean them in salt water and use them. I don't sulk about the hard work. Even wheat, and turmeric, I wash, dry, and powder them before using."

"Jaivam means healthy. We feel that the vegetables we get from the market today are full of pesticides like urea, factamfos, and so on," remarks Rameshan Nair. Nooruddin, the president of the residential association at Maruthamkuzhy, says, "This generation is nothing but a bunch of prospective cancer patients, with their poor lifestyle and junk food consumption. Youngsters have little gardening knowledge; they have to build it up and learn through experience."

Some gardeners grew various medicinal plants and often showed me around the garden by pointing out their health benefits. For instance, pointing to a plant in her garden, Jayasree says, "*Manathakali* (black nightshade plant, also known as wonder cherry) is cancer preventive. An extract of *tulsi* and *manithakkali* on an empty stomach boosts immunity." Another gardener, while showing me around his garden, pointed out to *mullatha* (soursop) and attributed similar qualities. He added that *poonkolli* is a medicinal leaf with which we mix *karinochi* and *adalodakam* for cough relief. Yet another gardener, Shivanandan, recalled how some plants had become famous as diabetic and cancer preventive. In his words, "I first planted *chayamensa*. It came to me via the Krishi Bhumi group. Although it was initially popular as an exotic medicinal herb, later, I didn't want to grow exotic varieties, as it gave a strange taste and milky latex. There are mixed reviews on the benefits and harmful effects of *chayamensa*. I believe it is better to use local varieties, as they are most suited to the body. Exotic varieties may contain some features that may be incompatible."

Thus, by listing the multiple health precarities of the present, incorporating medicinal plants in gardening that boost immunity, and growing local varieties that are body-friendly, all the above

gardeners focused on health promoting aspects of organic gardening. Through this they redefine food as medicine and *jaiva krishi* (organic gardening) as the pursuit of health. Besides, unlike the claim of agricultural officers like Sunil that home gardeners prefer exotic crops, the above narratives indicate that the latter valued local, traditional varieties, identified their health benefits and made efforts to grow them.

3.8.3 Gardening as Homemaking in the City- Migrants' view

Migration, even when voluntary and driven by the lure of the city, creates many struggles for the migrant, the most important of which is emplacement, that is, “the struggle to make a place in the world” (Turton, 2005, p. 278). Jean (2015) points to the role of farming as enabling place making for displaced people. Out of the total urban gardeners in the study, 35 percent were migrants to the city. The following narratives illustrate the ways in which gardening helped migrants to make themselves at home in the city.

“What's a home without a curry leaf plant?” asks Shyamala, a sixty-year-old gardener. She recalls, “After I married, we moved into Thiruvananthapuram city. Before moving to this home, we first lived in a locality known as Ambalamukku. It was not a much-developed area then, but it had access to all amenities. We had good neighbours, and it was a lovely time there. We built our first home there on 10 cents of land in 1991. Since there were many coconut trees in the front and backyard, we had little space and sunlight to grow vegetables. Hence, I began vegetable gardening on my terrace and growing flowers and trees in the backyard. I made the best use of the space, including the parapet for growing vegetables required for my kitchen, such as chillies, brinjal, ladies' finger, and cowpea. I made the ten cents like a jungle by planting medicinal plants like neem, besides mangoes, *lavaloli*, and *sheema plavu* (breadfruit). Everyone would mock us, saying our home was a jungle. Once, when my children wished for a bathtub, my husband built them a natural tub. He created a small pond by cutting out a channel from a nearby canal. During rains, fish would also flow into the pond from the canal, and the sound of water flowing made it look like being on the Kallar river in the countryside from where I come. I am more attached to Ambalamukku. Behind our home were paddy fields. It was two hundred metres away from the road. I could see the temple from my rooftop. As Ambalamukku developed, the road widened, and traffic increased, we moved to this relatively quieter location. However, things are changing here as well.”

Although an M Sc Agriculture graduate, Ravi is a banker who gets posted in a different district every three years. His wife says, “My husband is very passionate about gardening. Wherever we are transferred, we rent a home considering the feasibility of gardening there. Hence, we avoid living in flats.” Sumathi, a native of Kollam, migrated to Thiruvananthapuram forty years ago. In her words, “There was no concept of terrace gardening in 1995. In my hometown, taros are widely grown. Out of *kothi* (greed) and nostalgia, I started growing them here in the city. Whenever I returned home, I would plant cuttings of *vettu chembu* (taro) in the backyard. However, although leaves formed, tubers failed. Then I experimented on the rooftop. Taro and ash gourds (*thadiyankaya*) were the ones I first grew on my terrace. Ash gourds grew abundantly. I would take it to the office and share it with colleagues.” Jayachandran, a migrant to the city, says, “There are a lot of bird and animal friends that visit our garden every day. He adds, “The *marapatty* (palm civet), a nocturnal animal, has made our rooftop its home, visiting every night, eating away some fruits and vegetables. Earlier, they used to be afraid of our presence. I talk to them. Over some time, they have grown familiar with us and now take us for granted.” Thus, home gardening is also means for humans and non-humans to make themselves feel at home in the city.

3.8.4 Gardening as Remembering

Gardening is an occasion that evokes social memory associated with urban spaces. While migrant gardeners try to make themselves at home in the city by recreating their food culture through gardening, native gardeners grieve the changes to the landscape over the years. For instance, pointing to the areas opposite the road in front of us, Bindu, an elderly gardener said, “These were all agricultural fields turned into residential areas. This place was *anjumukku vayal* (a junction of 5 paddy fields). People would grow vegetables after the paddy harvest, mainly spinach and cucumbers. They never used industrially produced chemicals. We hardly bought vegetables from the market. Today, as the population increased and land was divided amongst successive generations, people began building homes. The huge road in front of us was no bigger than a field boundary in the past.” Thus, Bindu emphasises how local production and consumption enabled food security and food safety for people once upon a time. Another native of Thiruvananthapuram, Leela, says, “Houses everywhere...houses occupy the entire plot ... no more backyard...no gardens. This is the condition of most homes in the city.” Likewise, Jambavathi, a 56-year-old gardener says, “People buy 3 cent land, build a three-storey home,

and pollute the environment with waste.” By remembering the agrarian and backyard gardening culture on whose ruins stand the present built environments, native gardeners try to keep the memories of an agrarian past alive. Thereby as Barthel (2014) puts it, gardening “acts as a memory worker to combat ongoing generational amnesia among city dwellers about the intimate link between local agro ecosystems and food security” (Barthel, 2014, p. 429).

3.8.5 Gardening as Horti Therapy

The role of gardening in psychosomatic healing is widely known. Six gardeners in the study viewed gardening as a therapeutic activity. The following cases illustrate the many ways in which gardening acquired meaning as a healing endeavour.

Jessy

One of the gardeners I met while accompanying the grow bag distribution team was Jessy, who had been recently widowed. Upon enquiring about the reason for placing orders for grow bags, she said, “My husband loved gardening. He passed away a few months ago. He was working in the Gulf. All the trees around my home are the ones he planted. He tried growing curry leaves in the backyard. It didn't succeed. We applied *kanji vellam* (rice water), yet the curling of leaves didn't stop. I hope it succeeds this time on the rooftop. After my husband's demise, my health deteriorated. I began getting severe body pain. I tried naturopathy, which demands a fruit diet and fasting, and it has been effective so far. I used to grow microgreens. My domestic help informed us of the supply of grow bags at the Krishi bhavan (agri office) at Palayam, and we enrolled in the scheme. It is a good sight to watch plants bearing fruits. It gives happiness and peace of mind. I keep watching Youtube and *kothikyum* (envy) about how others use innovative techniques to grow plants.”

Scholars examining people's transition to alternative food practices use the concept of “fracture” (O'Neill et al., 2019, p. 226) to denote sudden changes in one's life, which may cause one to pick up sustainable food practices. Likewise, in Jessy's case, the loss of her loved one is an event of ‘fracture’ that enabled her ‘transition’ to organic gardening.

Similarly, Archana, although not new to gardening, admits, “For the past two years, I have been actively involved in gardening than ever before since I lost both of my parents. I am a single child, and my parents moved in with us since we moved into this home. Every place in this home is full of memories. Farming is a good distraction from those haunting memories.” Another family who emphasised the therapeutic effect of gardening was that of Siraj. Like Jessy's late husband, he was a Gulf worker who came home every year to visit his

family. On one such visit, Siraj got diagnosed with a rare brain disease in which a cyst had developed in his pituitary gland. Siraj's wife, Aysheth, recalls vividly thus, "When my husband was discharged from the hospital, he had to spend a few months at home to recover. During those days, I would bring plants from nearby nurseries, and he slowly started tending to them. Gradually I bought many more plants, and once he returned to driving like before, we went to the Vellayani College of Agriculture to collect seeds and manure." When I met Siraj, he had not only recovered but had also begun experimenting with a mobile retail food marketing venture known as Surakshita, which sources safely grown local fruits and vegetables from the farmers of Vellayani (agricultural zone in Thiruvananthapuram district) and distributes them to the city residents. Padma Suresh, a 42-year-old homemaker whose son has cerebral palsy, says, "Until a few years ago, every evening, we would take my son to the terrace garden. Sitting there, he would enjoy the sight and sound of birds visiting the garden and hurrying back to their nests. He would respond positively to that. However, as his weight increased, it became difficult for us to carry him. We don't do it any longer. His condition weighs down heavily on us. Gardening is an escape for me from sadness. Whenever I become sad, I engage myself in gardening." M J Paul, a retired agricultural scientist and gardener, recalls attending a project at a school in Thrissur for children with mental disabilities. He said, "I have observed that gardening helps calm down restlessness and increase cooperation among these children."

T. D. Krishnankutty says, "The main aspect of gardening is horti therapy. A sedentary lifestyle makes us depressed. On the other hand, spending half an hour with plants, tending to them, looking for pests, and so on makes us agile. The Regional Cancer Centre (RCC) is a few kilometres from my home. Apart from medical treatment, the important suggestion given by doctors to patients is to eat good food. We have often supplied our home-grown vegetables to the inmates of the RCC. For the past fifteen years, one of our neighbours has been gardening. That is following his wife being diagnosed with cancer. She has recovered now. He says gardening has become a therapy for her."

The above narratives detail the therapeutic effects of gardening in terms of helping gardeners cope with personal loss, enable speedy recovery, mobilise strength to deal with life's challenges, besides keeping them mentally and physically alive and agile.

3.8.6 Gardening as Creativity

As mentioned in the previous chapter, 52 % of the home gardeners were retired hands. Miller et al. (2018) in their study of gardening in a retirement community in Australia, point out how

gardening in later-life emerged as sites of building identity, resilience, and creativity. They classified retirement gardeners into five types, one of which included the category called creative gardener. Creative gardeners were those who used gardening as an act of self-expression. This creativity ranges from gardenscaping by unique arrangement of plants according to size, colour, and so on in the garden to making art out of garden produce. Likewise, in the present study, gardening has brought out the creative personalities of the gardeners. For instance, T. D. Krishnankutty, a 72-year-old man, says, “I took to gardening post- retirement. Now, it is my hobby to make art with vegetables. As part of the Urban Environment Improvement Programme (UEIP) launched by the government, we were asked to mail photos of our daily vegetable harvest. After a point, it was boring to send photos of collected plants; instead, I got the idea to arrange them into some shape or the other. I make shapes of animals, birds such as a local bird (*Figure 3.2*), a peacock (*Figure 3.3*) and mating birds (*Figure 3.4*). The logo of Krishi Bhoomi, a weekly organic market in the city, is my food art. Every day, my good morning messages in the WhatsApp group of fellow gardeners are in the form of vegetable art. One day, a group member suggested I add my signature to my art. Since then, I have been known as TDK! I have many admirers of my vegetable art, to the extent that one of my cousins gifted me a painting of one of my works”. His wife intervened, “Sometimes, he sits for hours with these, often forgetting that I need these vegetables to make curry for the day”.

Figure 3.2: Vegetable Art of Local Bird by Gardener



Source: Fieldwork

Figure 3.3: Feasting Peacock by Gardener



Source: Fieldwork

Figure 3.4: Mating Birds Art by Gardener



Source: Fieldwork

These kinds of creative expression earned T. D. Krishnankutty a name (TDK) and identity as an artist among his family and the gardening community of which he is a part.

3.8.7 Gardening as Empowerment

Urban gardening is often associated positively with women empowerment in monetary and non-monetary terms (Slater, 2010; White, 2011). Although in the present study male gardeners

outnumbered females and most of the gardeners were middle-upper class, the case of a woman gardener named Jayasree is worth mentioning as it illustrates the ways in which gender and precarity intersect and how gardening offers a means of transforming the situation.

She says, “I got married very young and shifted to Madurai, where my husband worked. Having lived freely here, city life in Madurai was very suffocating. I was interested in cooking and would watch my mother-in-law make delicious mango pickles. I once asked her to teach me how to make them, but she refused, saying she would lose her *kaipakkuvam* (gifted hand) if she passed on the techniques to someone during her lifetime. I was dejected, yet determined to learn it on my own by recalling the taste of my mother-in-law's pickles. Soon, I began selling them, and my enterprise became a huge success. Later on, due to repeated miscarriages, we moved back to Thiruvananthapuram. Here we lived in rented homes. I continued making pickles here, and on one occasion, from my kitchen waste mount, bitter gourds sprang up in plenty. However, the owner didn't like it and cleared them all. He also cut down the plantains and papaya. Then we built our own home from my share of ancestral property. My husband doesn't like me gardening or growing poultry. Initially, I had five hens, but the neighbours' dogs attacked them. Later I reared a few more, and while they were still laying eggs, the neighbours poisoned them.

Despite these setbacks, the turning point in my life came in 2010. I attended Samagra Krishi Vikasana Paddhati (integrated farming programme) organised by the then government at the city stadium here in Thiruvananthapuram. It was part of RKVY (Rashtriya Krishi Vikas Yojana). My name got picked in a lucky draw of applications for the scheme. I have received immense support from Krishi bhavan and government officials for my farming endeavours. I consider it as God's plan. Once, while cutting down the leaves and branches of the *karuvapatta* tree in my backyard, an agricultural officer named Jomy, who stopped by my home, told me of the economic importance of *karuvapatta* leaves. She taught me how to process them by drying them in the shade, and following her advice, I could sell 10 kgs of the leaves, with each kg fetching me 450 rupees.

'You pick your own' was an initiative in which I let people choose and pick vegetables and fruits from my garden. It was an integrated farm producing vegetables and eggs. I chose ducks as they give me a better income. There was a severe drought in 2015-16, and the water supply was reduced. Most of my plants, fishes, hens and ducks became weak and died. I stopped letting visitors and once again felt very heartbroken. One day, a lady from Sreekaryam (a nearby town) motivated me to continue gardening by giving me a seedling of passion fruit. She asked me to begin again with what little water was left. Besides, the then MLA supplied me with 1500 litres

of water from the collectorate to save my dying animals and plants. I wish to refrain from taking loans from the bank. I believe in saving from my business. All the money I invested came from my hens, whose numbers have increased progressively over time, reaching up to a thousand. I suggest others also start small and save themselves. I bought grow bags and plants using the money I got from selling eggs. I also sell poultry waste for 200 rupees per kg to home gardeners in need. Anitha, who runs the weekly organic market in the city, is my regular customer.

Whatever I do never ends up being wasted. However, my husband constantly mocks me, saying I am useless. To prove him wrong, I learnt about mushroom culture. I have not had any formal education or training, but from quite early on, I have been very experimental and creative. I believe in my past life. Perhaps because of some good deeds in the last birth, I have some natural inclination to try new things; else, what can explain the success of all my endeavours with very little external help? Take my pickle sales, for instance. I have very little in the way of family support. I got married very young, but I suggest that women marry after they find a job for themselves. It is my plants and quails that bring meaning to my life.”

Thus, even when some agricultural officials raise the scepticism that urban home gardening is nothing but a hobby of the elite, here Jayasree’s case proves otherwise. Jayasree’s case points to the ways in which she achieved financial empowerment, social respect and recognition, both denied to her by her spouse and in-laws. While the latter limited her to the category of ‘wife’, gardening expanded her identity. Cooking and later gardening offered a way for Jayasree to combat the vulnerability, and precarity brought about by early marriage, migration and miscarriages, residential instability, and restrictions at home.

3.8.8 Putting Quality First: Salvaging, Bringing Taste Back to the Table

Besides health and ecological impacts, qualitative aspects of food such as taste, and food diversity had declined thanks to industrial farming. For many urban home gardeners in Thiruvananthapuram, organic gardening is a means to bring taste and lost varieties back to the table.

For example, Vimala, a rooftop gardener states, “There is a huge difference in taste between home-grown food and the ones we get from the market. The latter is grown using ammonia, reflecting a bland and sometimes watery taste. When you see a large sized vegetable/fruit, you will know immediately that it has been grown using chemicals, such as ammonia.” “When I go to Pune, I buy bananas; they taste very different from the ones I grew up eating here. Besides, they decay very soon. I can detect it very easily,” adds her daughter Archana. Jyotish Kumar is

a retired businessman who spends his time practising law and gardening. At the time of my interview with him, he had placed a plate full of a variety of bananas, asking me to identify by tasting each one of them. He said, “Besides the rooftop garden, I have bought a few acres of land near the banks of Neyyar River, in a place called Neyyatinkara in Thiruvananthapuram district. I grow bananas there. Today, I am selling bananas worth 40,000 rupees. Here are a few: *kappa pazham*, *njalipoovan*, and *ethakka*. If each of us puts in maximum effort, we can revive lost varieties. I was born in Neyyatinkara, a rural part of Thiruvananthapuram. We were a farming family. We had *ponnankanni* (a nutritious, native variety of spinach) and drumsticks growing in our kitchen garden in my ancestral home. I am looking to revive *ponnankanni* spinach. Besides, I am trying to preserve *poocha pazham*, miniature passion fruit, and *monthan kaa* (plantain variant), some of the endangered varieties. I have a conservation mentality. There are many extinct plants. His wife Archana intervenes to add, “Ten years ago, I cooked cluster beans, and it tasted different. When I visited my in-laws, they also reported something odd with the cluster beans they cooked. Nowadays, people are so used to eating poor quality food that their taste buds can hardly distinguish good food from bad. To sum up, it is to ensure good, tasty food for ourselves that we took to gardening.” Thirty-five years old Seema recalls, “The homegrown spinach's taste and colour remain etched in my memory. When I mixed it with the rice, it gave off a crimson colour and taste to the rice. The spinach we get from the market often bleaches off its colour and tastes like grass. Everyone with whom I shared my homegrown *cheera* (spinach) kept asking for more. She adds, “My husband often forbids me from buying large-sized pale yellow *ethakka*, which he despises as '*tamizhan kaa*' (referring to the fact that it comes from Tamil Nadu, where it is grown by excessive application of chemicals and pesticides). One day he got *Nadan Kaa* (native plantain) from one of the farmers in Venganoor. Those were smaller, darker yellow in colour and tasted great.” Sixty-year-old Rema says, “Chemotherapy, during cancer treatment, leaves our tongue tasteless as the cells become dead.” Pointing to the miracle fruit on her rooftop, she continues, “Cancer patients can eat this along with their food to get some taste. Other people, like us, can bite a sour lemon after eating this. It will taste 100 times sweeter than the sweetness you get when you drink water after eating gooseberries.” Shyamala says, “I have a dream—to promote gardening in every home. On my son's birthday, I attached seeds instead of the usual chocolate as a gift to the guests. Since 2006, I have been collecting mango seeds, *chakka* (jack) and *anjili* (wild jack) seeds, and then dry them to sow them in vacant plots on highways and roadside while I travel.”

Thus, by contrasting home grown food with conventionally grown food in terms of taste size and colour, and salvaging dying varieties, urban gardeners point to the qualitative aspects of

growing organically. In this manner, they expand the meanings of urban organic gardening beyond just a means to self-sufficiency (growing one's own food) and food safety (growing pesticide-free food). Besides, by growing fruits like miracle fruits that animate the dead taste buds of cancer patients, they emphasise the role of taste as an integral component of food.

3.8.9 Growing Safe Poison-Free Food

Among the short-term gardeners, it is the risk of consuming contaminated food that has motivated them to take up rooftop organic gardening. The media and awareness camps by governments played an important role in constructing this risk. As Beck (2006) puts it, "Risks are not 'real', they are 'becoming real'... without techniques of visualisation, without symbolic forms, without mass media, etc., risks are nothing at all" (Beck, 2006, p. 332). The following narratives indicate the effective role of media in persuading people to take up rooftop organic gardening.

Sixty-year-old Krishnan says, "I have been to Tamil Nadu farms where I have seen around 70-80 tomatoes on a single plant and bought them for low prices. Later I watched YouTube videos and media reports on places where farmers were spraying pesticides and fertilisers indiscriminately." He shows me a video explaining how official visits revealed that vegetables, mainly carrot, beetroot, cabbages, and cauliflower, arriving in Kerala from places in the neighbouring state of Tamil Nadu, such as Niligiri and Mettupalayam, are grown in soils drenched in pesticides. This was followed by a warning to consumers not to get carried away by the size and price. Another gardener Radhika Devi recalls, "I started rooftop gardening 8 years ago in 2010 when I was the secretary of *KudumbaSree* (neighbourhood women's group¹). During that time, there was great momentum in the state regarding organic farming and officers in the Krishi bhavan were involved in creating awareness about *visham* (poison/pesticide residue) in the *pachakkari* (vegetables) arriving in Kerala from the neighbouring state of Tamil Nadu. Chillies and curry leaves contain pesticide residue. I participated in the awareness programme, and the videos they showed us were eye-opening, which motivated me to start growing my own food." She adds, "We follow *jaiva Krishi* (organic farming) without using any *raasa valam* (chemicals). Spinach grows very well on our rooftop. Ladies' fingers, too, are always available. We have around 15 hens now. We get bananas from the neighbouring plot owned by our relatives, so no need to buy them from the market." She continues, "My daughter is a nurse; she is very particular about food safety; she doesn't even buy biscuits for her little one. We have a small vegetable chopper machine to give finely chopped homegrown veggies

to the little kid. Because my daughter is educated, she keeps alerting us that almost all food from outside is contaminated in some way or the other.” After a while, her sister-in-law Sheela joins us in conversation. She is a schoolteacher. Walking me through her small rooftop garden, she says, “I have been gardening for the past 5-6 years. I have been growing brinjal, ladies finger, cucumber, peas, tomato, bitter gourd, cabbage, cauliflower, salad cucumber, curry leaves, ivy gourd, drumstick, spinach, papaya (dwarf variety named red lady suitable to grow in pots), and oranges. My main motivation is to grow and use poison-free food! We don’t buy curry leaves from the market anymore.” Like Radhika Devi, Poojapura Residence Association President Divakaran Pillai says, “Growing one’s own vegetables is the latest trend, as mass media reported increased pesticide residue in everyday use vegetables. That this may lead to cancer and other grave diseases alarmed me. Following mass propaganda by the government to grow safe-to-eat vegetables at home, I was also moved to start rooftop gardening. I grew saplings of some fifty papayas and distributed them to my neighbours. If they raise a few lady’s fingers, and curry leaves, they won’t have to buy *vishamadicha* (poisoned) vegetables from the market. Every home needs only 25 grow bags. Most people have digestive issues because of their lifestyle. They are adopting the western style. They become couch potatoes, watching television, sipping tea, and eating everything that comes their way, especially bakery foods with added food colours and refined flours. Many people run after tasty food, but quality matters. Home-cooked food and home-grown vegetables are always better.”

Not only ordinary people but also scientists have taken to home gardening through media influence. For instance, Dr Rekha, a retired professor at an agricultural college, says, “I started growing my own chillies after seeing a disturbing video clip of farmers in Tamil Nadu spraying pesticides on a heap of chillies.” Ganeshan, a practising advocate and rooftop gardener, adds, “There is a huge campaign against chemical fertilisers and pesticides, citing cancer cases. I believe the judicious use of chemical fertilisers on a small scale is not an issue. Large-scale use for commercial cultivation and market is dangerous; we know about Endosulfan. Rising cancer cases are due to lifestyle changes and lowered immunity. Nature is no longer pure these days; it is polluted. It is one of the reasons, though not the only one. Natural immunity is important; it is the base point of health. We are an older generation that grew *nadan* (local) vegetables. When we were growing up, we didn’t depend on vegetables from Tamil Nadu. I remember the vegetables I ate came from Sasthamkotta in Kollam (a district adjacent to Thiruvananthapuram). Kerala has good medical facilities; however, cases of morbidity are high these days. During my childhood, I rarely visited hospitals.” Rajesh, a rooftop gardener for the past ten years, says, “My motivation is mainly due to awareness of *pachakariyile visham*

(pesticide residue in vegetables). Cabbage and cauliflower are almost soaked in pesticide residue. People cultivating on a large scale need to apply them. Otherwise, they won't have any return on their investment. For instance, even with spices like cardamom, the outer cover must be removed before consuming it.”

From the above narratives, it is evident that although none of them have directly experienced problems due to pesticide residue, they have been influenced/affected by mass media to take to home gardening. Popular media discourse takes the form of putting the blame on neighbouring states and labelling the vegetables imported from these states as poisoned. This is reflected in the way these gardeners define *jaiva paachakkari* (organic vegetables) in contrast to *vishamadicha pachakari* (poisoned vegetables) coming from the conventional markets. Beyond taking to gardening, it has made gardeners avoid many other processed food items such as biscuits from markets and exercise caution while consuming spices and condiments on which they are inevitably dependent on the market.

3.8.10 Tales of Toxic Exposure

Beyond the social construction of risk through social media, many rooftop gardeners cited their personal experience with toxicity from food and other items of daily consumption. Besides, they recounted cases of their acquaintances affected by toxic exposure. “Altered bodies, subjectivities, and affects often emerge with toxic exposures” (Kirksey, 2020, p. 24).

Sumam, 68 years old gardener, recalled her experience with food toxicity. She says, “Once I visited Nasik, I saw many grapes. We bought a much sought-after variety of grapes. After eating those, my husband got an allergy. We didn’t realise it then. However, the following year, the same thing happened. We stopped buying grapes from then on. Later we learnt that grapes have the most significant amount of pesticide residue. Another gardener, Mohanan, recounted that the popular hair dyes in the market caused him allergic reactions in the form of redness and swelling in the eyes. He said he would look up the herbal dye powder recipe he noted from Youtube, and if it contains Neeli Amari, he plans to get the plant from Sreekumari amma, his neighbour who is also a gardener.

Shobha, a middle-aged working woman, says, “We do not consume much chicken because we know they are all injected with hormones; there are rising cancer cases. Maximum, we prefer homemade food. Earlier, we used to go outside. Primarily, our people no longer cook in restaurants. Migrants from other parts of the country are employed, and we have no idea of the way they cook. I was not used to buying vegetables or fruits from outside till I moved to the

city. I have heard shocking stories of my dear and near ones getting affected by poisoned fruits and vegetables. For instance, my husband's friend had an experience of burning his mouth from a mango he purchased from the market. Those mangoes are artificially ripened using chemical inputs like ammonium. It is high time we started thinking of going green again, or the future generation will suffer from chronic diseases. Indira ma'am, a colleague of mine, underwent a medical checkup, and the reports showed toxins in her blood. The doctor then suggested she avoid consuming vegetables and fruits from the market for a week. Her poison levels dropped drastically after a week. Her experience and story remain etched in my heart even today. As third world countries start consuming the foods of the first world, such as Kentucky chicken, and our lifestyle leans towards seeking pleasure more than quality, we are witnessing a rise in cancer cases, especially gastrointestinal cancer. Obesity is also on the rise among children. I make my girl eat only homemade food most of the time. First of all, people must be aware, especially parents."

"The main motivation to keep doing vegetable gardening is that some of my friends are undergoing cancer treatment in its first stages," says Girija, a homemaker and ex-nurse at the Regional Cancer Centre. She said, "We are aware of the risk from processed meat to non-vegetarians these days. However, what puzzled me was that all of my friends who got cancer were vegetarians, which led me to doubt that even vegetables from the market may not be safe. Besides, there is a vast difference in the spinach we consume these days from the ones we had in my childhood. I believe it is essential to do what is within our capacity: grow one's own vegetables. That may reduce the risk of exposure to toxins through food, if not from sources of cancer beyond our grasp. I have worked at the Regional Cancer Centre (RCC) for a few years. I resigned from there as, over a period, I went crazy and paranoid, observing cancer patients and listening to their stories. It was very depressing. My colleague was suffering from a persistent cough, and when she checked as per the doctor's advice, she was diagnosed with cancer. We start doubting ourselves the moment some changes appear in our bodies. Once I felt a lump in my breasts while feeding my daughter. I got hysterical, and thankfully, it turned out to be nothing but a lump formed due to the solidification of breast milk. However, I got it removed surgically, following fear of whether it might turn into a tumour in future. Earlier, cancer cases were rare; one in a thousand was affected with cancer. Now, that's not the case with rising breast and uterine cancer. While working in the case sheet record section, we encountered many cancer cases among non-vegetarian populations. I would think it was that perhaps they consumed a lot of red meat, which contained toxins. However, these days anyone is vulnerable to cancer. For instance, my husband shared the story of a woman diagnosed with

cancer following pregnancy. All she ate was fruits like apples, grapes, oranges and so on! These stories make us fearful of buying vegetables and fruits anymore.” Girija’s experience attests to the universality of health precarity for urbanites in Thiruvananthapuram.

Rajagopalan Nair, an elderly gardener, recalls, “Sometimes, I visit a fertiliser shop in the city to buy neem cake for my garden. They sell organic and inorganic fertilisers. If you go near that shop, you may become dizzy after a point. I wonder how the staff work there!”

Suresh, a PWD (Public Works Department) contractor and a long-term gardener, says, “I have participated in classes held at the RCC. The doctors have shared records of rising cases of intestinal cancer and work to raise awareness about the toxins that reach us through food. They persuade the patients to take home gardening if possible and often hold classes by inviting experts in terrace gardening in the city. For those who cannot, they suggest thoroughly cleaning the vegetables before cooking and soaking them in turmeric and salt. Our home-grown food may sometimes end up as a medicine for some. Once a man came to our home asking for organically produced passion fruit and eggs from a native breed of hen. He wanted it for his five-year-old son battling some severe disease. Another person regularly bought my home-grown fruits. Later, when he stopped coming, I learned he had been battling cancer. Such moments are indicators of the increasing need for organic gardening.”

Maya, a 56-year-old gardener, says, “These days, cancer cases are common. My friend owns a famous nursery in Ernakulam. Her daughter was diagnosed with cancer. Every place is polluted and contaminated. We must do what we can on our part. *Visham* (poison) is everywhere.”

These tales of toxic exposure and rising cases of cancer reveal how living in the city has become precarious for many people in terms of health vulnerability ranging from allergies to cancer. It shows that precarity does not always come as a one-time event such as being laid off from work or being affected by a catastrophe in the form of pandemics and disaster. Nor is it a distant possibility. Rather, as the above narratives indicate, it occurs through the toxins in the food and drugs we consume every day, and to the people we meet on a day-to-day basis which puts us in a position of shared vulnerability. It is in the context of this universal and everyday health precarity of urbanites that organic rooftop gardening becomes meaningful and valuable.

3.9 Conclusion

This chapter examined the multiple meanings of urban home gardening that multiple actors give. Policymakers look at urban home gardening as a micro-level intervention to address the

three challenges of urban food safety, self-reliance and waste management. The narratives of agricultural officers and former scientists point to more significant issues of withdrawal of people from agriculture due to urbanisation, urban food security, farmers' plight and issues of inputs and yield when transitioning to organic farming on a larger scale, unlike the policy's grand ambitions to move towards an organic state (*jaiva* Kerala). In this context, they look at rooftop gardening not as a means to self-sufficiency but as an elite hobby. Besides, they value it as an opportunity to practise organic farming on a small scale, yielding sufficient for a household and effectively managing household waste. Non-governmental organisations like Manoj's also locate urban home gardening as part of a more significant social movement for food safety and urban waste management. However, unlike agricultural officials, they believe it is possible to achieve food security through land based organic cultivation if it were not for the pesticide lobby.

However, eating safe and growing one's vegetables assume significance and meaning in contexts beyond policy goals of self-sufficiency, food safety, and waste management to aspects such as pleasure, health as end in themselves. Moreover, migration, retirement life, changing lifestyle, rising diseases such as cancer, sudden loss, and various other precarious situations in which urbanites live add meaning to the process. This chapter thus explored how rooftop gardening practices shed light on urban precarity. It detailed how people perceive and experience precarious urban life through their own and others' exposure to various types of toxicity. It also highlighted the affective role of social media and responses to media activism by the state in dealing with collective risk. The gardeners use the word *jaivam* (organic) in contrast to *visham* (poison). For them, *visham* is an umbrella term that applies to all and any chemical used in conventional food production, including urea. However, agricultural officials and scientists consider chemicals such as urea as essential if applied judiciously. Also, the experts define organic in quantitative terms of the percentage of carbon content, whereas home gardeners define organic as anything other than 'chemical'. Above all, following the gardeners' narratives, what emerges is the role of rooftop gardening in making a house in the city a home and life happier amidst multiple precarity. Besides, the gardeners' perspective provides a holistic understanding of food as medicine, appealing to the senses in terms of taste, colour, and size within visual limits, in contrast to oversized, bland-tasting vegetables grown through chemical farming. These perspectives go beyond the narrow definition of rooftop gardening in terms of growing 'safe to eat' vegetables. Precarity is often associated with income uncertainties. However, as outlined in the previous chapter, the socio-economic profile of the city and the urban home gardeners indicates that Thiruvananthapuram is one of the

economically advanced cities in India and most of the home gardeners belong to a secure income group. An examination of the meanings they give to urban gardening indicates the various precarities that this society endures, against which context gardening becomes meaningful practice.

Chapter 4

Materiality: Gardening as the Animistic Performance of Kinship

While the previous chapter explored the why (i.e., meanings) of urban gardening in the city of Thiruvananthapuram, this chapter looks at the materiality- the second element of social practice (Shove, et.al, 2012). It focuses on ‘what’ constitutes the practice of gardening and what the components/materials/entities become in the process. The concepts of assemblage and becoming (Deleuze & Guattari, 1987) and the anthropological concept of new and critical animism are helpful in this regard. In simple terms, assemblage is “the working together of components” (Page, 2020, p. 223). However, Buchanan (2015) attempts to correct a common misconception regarding assemblage as chaotic and lacking meaning. Recalling the original word “agencement” (Deleuze & Guattari, 1987), he says, “The assemblage is purposeful; it is not simply a happenstance collocation of people, materials and actions, but the conscious realisation of a specific plan” (Buchanan, 2015, p. 385). Following the new materialistic, and more-than-human turn in social sciences, this chapter tries to challenge the idea of gardening as a human-designed activity, where the non-humans (plants, pests, and things) are mere beings or instruments fulfilling human purposes. Instead, it seeks to look at gardening as an assemblage, foregrounding the intentional ‘doings’ of all entities, human and non-human. According to Maller (2018), “There are three features of new materialisms: (1) new materialisms are about processes of becoming, (2) matter is always considered vital, and (3) material agency is not predictable, predetermined or prefigured” (Maller, 2018, p. 54). The following sections detail core activities, such as sourcing inputs, composting, setting the soil, filling the grow bags, planting, tending, harvesting, sharing, and marketing, through which the materiality of urban gardening in terms of the vitality, agency, and indeterminacy comes to light. In this process, often binaries and boundaries such as human/nature and rural/urban become blurred.

“A scholarly trend that offers a radical critique of the human-nature binary, and anthropocentrism as its corollary, is ‘new animism’” (Yoneyama, 2021, p. 255). It moves away from the Tylorian view of animism as a mistaken belief of primitive people. Instead, it is a way of relating to beings other than humans (Harvey, 2013). ‘Other-than-human persons’ is a term first used by Irving Hallowell to indicate that humans are not the only beings with a personality (Astor-Aguilera & Harvey, 2018). “Animism is a relational epistemology” (Bird-David, 1999). In this sense, gardening is one of the ways in which humans relate with other-than-humans

(plants, pests). However, as Yoneyama points out, new animists tend to confine animism to indigenous worldviews and practices of non-modern societies. She draws attention to the revival of animism in modern Japan through the works of environmental activists and artists as a grassroots response to the socio-ecological crisis caused by industrial and nuclear disasters such as Minamata mercury poisoning and Fukushima. Citing the animism portrayed by contemporary Japanese filmmakers like Hayao Miyazaki, she advocates for critical animism that defines the animism of non-indigenous (modern) societies (Yoneyama, 2021). Yoneyama defines critical animism as “formed from within modernity as a critique of modernity by those who observe animistic epistemology, ontology, and practices” (Yoneyama, 2021, p. 257). Following Yoneyama, this chapter explores the people-plant interactions and care practices that make urban gardening in Thiruvananthapuram an animistic performance of kinship.

4.1 Sourcing Inputs

Obtaining seeds/seedlings and organic fertilizers is the first step in urban rooftop gardening. Unlike traditional land-based agriculture, inputs such as seeds and fertilizers have to be sourced from elsewhere in urban gardening. Only three participants reported self-sufficiency in inputs, whereas most gardeners (94%) sourced their inputs from home and the market (see *Table 4.1*). Much like other inputs, soil too has to be sourced from outside. There are formal and informal ways in which gardeners find inputs such as soil and seeds, or sometimes seeds find their gardeners. Formal sources include the state-owned Krishi Bhavans, Agro bazaar, and the agricultural college at Vellayani (see *Table 4.2*), besides private agencies such as nurseries, farmhouses, Krishi Mithra, and supermarkets that sell seeds for urban gardening.

Table 4.1: Sourcing Inputs for Gardening

Input sourcing	Frequency (no.s)	Per cent (%)
Both	142	94.7
Bought	5	3.3
Home based	3	2.0
Total	150	100

Table 4.2: Response to whether Input is Sourced from Vellayani Agricultural College

Input sourced from Vellayani	Frequency (no.s)	Per cent (%)
Yes	24	16.0
No	126	84.0
Total	150	100

The Krishi Bhavan, as part of its vegetable development programme, supplies twenty-five grow bags with vegetable seedlings. Seventy-year-old Gopalakrishnan Nair recalls, “Within two months of applying for the scheme at the nearby Krishi Bhavan, they supplied us seedlings of tomato, brinjal, ladies’ finger, cowpea, and chillies.” Besides, the Krishi Bhavan distributes seed kits known as *onathinu orumuram pachakari* (Basket of vegetables for Onam) annually. Some Krishi Bhavans, such as the one at Kudappanakunnu, employ *Karma Sena* (see chapter 3) to make potting mixture (sand, soil, and coir-pith compost/cow dung in the ratio 1:1:1) recommended by agricultural scientists for urban gardening. Others outsource the making of the potting mixture to agro service centers in the rural parts of the district. These agro service centers procure soil from hilly interiors, cow dung from farmlands, and coir pith from coir-making industries. They then employ rural women, often from self-help groups, to prepare the potting mixture. Thus, urban gardening is dependent on rural areas and farmlands for most of its soil and organic fertilizer requirements.

However, most gardeners often report problems with the soil supplied through Krishi Bhavans. For instance, Suja Abraham says, “An important issue is the lack of soil in cities and the poor quality of soil in grow bags supplied by the government. Wherever I go, I come back with my car full of mud, cow dung, flowers, plants, and so on. I call my car *Krishi Vandi* (farm truck)!” Backyard soil is not suitable for growing vegetables, even among those with backyard space. This is due to the sticky texture of red loamy soil which makes it hard and unsuitable for planting crops. As Nishi Loyi, a long-term gardener, recalls, “The greatest limitation for urban gardening is the lack of space and good soil. Lately, thanks to the Indo-Japanese drinking water project, I gathered some soil from the heaps that were dug out for pipe installation. Red soil is not good for grow-bag gardening. It hardens after a while and doesn’t allow enough aeration, affecting root growth.” In such a situation, the soil dug up and discarded by large urban

infrastructural projects ends up catching the eyes of gardeners like Loyi, who then bring it to life by growing plants.

Out of all the formal sources of seeds, 24 gardeners who participated in this study preferred the seeds supplied by the College of Agriculture, Vellayani. Suresh, an experienced gardener says, “The presence of the agricultural college at Vellayani is a boon for the people in Thiruvananthapuram. In addition to seeds, they sell saplings, nutrients, and so on. I return with my car full of these essentials whenever I go there. We can find 4-5 varieties of ladies' fingers at Vellayani”. Similarly, pointing to a recently potted chilli plant, Radhika Devi, an expert gardener, says, “It is from the *karshika college* (agricultural college); they seem to be more resistant to many diseases. At Vellayani, they raise good quality saplings and seeds of almost every plant and fruit. Whenever my son-in-law visits us, the whole family, including the little boy, takes a trip to Vellayani.” This is proof that seed variety and quality such as disease resistance are some of the factors that make the seeds of Vellayani popular among the gardeners. However, 84% of the gardeners did not source their inputs from Vellayani. Sheeba, a working woman who lives in the city centre, says, “I do not go as far as Vellayani. I make do with seeds from friends and neighbors or private agencies.”

Further, there are informal ways in which gardeners get seeds from sources other than buying from markets and visits to agricultural research institutions. Sometimes, the gardener doesn't go in search of plants; instead, the plants come to them. For instance, Jayasree says, “On one occasion, from my kitchen waste mount, bitter gourds sprang up in plenty.” On other occasions, gardeners become gatherers, picking plants from the roadside, vegetable mounts in markets, etc. For instance, Rema, a 62-year-old gardener says, “Wherever I find good saplings, I pick them. I picked these from Palayam vegetable market, from the dump yard.” Some long-term gardeners like Maya do not buy seeds. She says, “We have never bought seeds from the market, except in recent times. Earlier, we would source them from friends and relatives. Sometimes we would sow seeds from the vegetables we buy.” “I save seeds,” says Rema. She continues, “I don't hesitate to ask my friends. We pick something we have long sought whenever we visit neighbors or friends. Once, we bought red cowpea seeds from the East Fort exhibition. I sowed arrowroot from the tubers growing in my native place.” Likewise, Jambavathi, who migrated to the city thirty years ago, recalls, “Earlier, we would collect seeds from the vegetables we bought in the market, or from friends and relatives at my home town in Vidura who were farmers. My sister-in-law would give us chilli seeds, as she had a farm. These days we buy from Krishi Kendra, a farmhouse at Chenthitta, and the agro bazaar. Hybrid seeds yield better but are costlier and can't be used again.”

George, a migrant from Idukki, says, "Once I plucked a stem out of the *neermathalam* (garlic pear tree) in front of the city museum. The tree is named after Madhavi Kutty, a famous iconoclastic feminist poet of Kerala." He showed me an *ambazhangya* (Hog Plum, a native sour fruit), which he bought from a nursery for 650 rupees, out of childhood nostalgia. "Rare ones are costly," he says. He also has a Venezuela rose in his garden. Pointing to a tree called Cinchua, his wife tells me of an episode in the epic of Ramayana, which refers to Chinchua as the tree beneath which Goddess Sita, wife of the legendary hero Rama, rested when Ravana abducted her.

Two gardeners in the study bought seeds online. Krishnan says, "I buy seeds online—from Amazon." I asked him whether he trusted the source while buying online. To which he replied, "Well, Amazon is a trusted company, I feel. There is a wide variety of seeds available online. Sometimes there are offers such as 'buy one, get one free.' Look at these, they look beautiful, and tetra packed, well-preserved unlike those supplied by the government". Sajna, another gardener, says, "I got baby corn seeds from an online company called Trust Basket." Apart from purchasing, seed saving and exchange are common practices among the members of certain City Residents' Associations. Mohanan, the secretary of the Maruthamkuzhy Residents' Association, recalled the promptness with which Sreekanth, a fellow resident, would pluck off plants from his garden to give to enthusiastic gardeners.

Some gardeners are on the lookout for indigenous varieties. For instance, Vimala says, "*Naadan vithu kitSunila*" (local seeds are not to be found these days), such as *neikumbalam* (native cucumber), *mayilpeeli cheera* (native spinach), and so on. Many are becoming extinct. I had to hunt everywhere possible to find and then preserve it." Tulasi, another working woman and gardener, also a migrant to the city, says, "There is a dying variety called *nithya vazhuthana* (native brinjal). It is a creeper variety, once abundant in my childhood days. Recently, on my way to Kottayam, I found it growing on a home fence, but I could not procure it. My husband insists on sowing seeds from every fruit or vegetable we cook. From such seeds, watermelons, guava, and so on have sprouted." In a conversation with Ayesheth, a homemaker and gardener, she asks, "Did you notice the *Agasthya keera* in our rooftop garden? There is a story behind *Agasthya keera*. The variety we find commonly is the white colored one. However, one day, I read in the newspaper that a cancer patient, while undergoing chemotherapy, worked on a seemingly wasteland on a hillside, where she cultivated a red variant of *Agasthya keera*. Subsequently, she recovered from cancer. A friend of mine happened to be her relative, and my friend got a plant for me upon my request."

Official sources such as Krishi bhavans do not have seed diversity. As Sneha, an agricultural officer, points out, "We have a seed vending machine at our Krishi Bhavan. However, Krishi Bhavans cannot cater to the growing demand for rare varieties. The seeds distributed by Krishi Bhavans are supplied by agencies like SHM (State Horticulture Mission) and VFPCK (Vegetables and Fruit Promotion Council of Kerala). However, through gardening groups in the city, people can share seeds of even GI-tagged vegetables like *vengeri vazhuthana* (a brinjal variety native to Vengeri) and *anakomban* (ladies' finger variety) among themselves. A couple I spoke with at the Thycaud organic gardeners' market told me that initially the focus was only on cultivating as many vegetables as possible; later, it shifted to growing as many varieties as possible. Now people not only want varieties and a greater number of vegetables in their gardens but also want to be the proud growers of lesser-known, unique plants—say, for instance, some indigenous varieties of custard (*mullatha*) and chilli (*kodali mulaku*, allegedly the hottest among chillies and best for adding to pickles)." Nalini, a member of Krishi Kutumbam, an organic gardening group, recalls getting a native variety of ladies' finger seeds from a *vithu vandi* (seed vehicle) that had come from Palakkad (a district in North Kerala) to the weekly organic market. The above-mentioned are the multiple ways in which gardeners source seeds.

Cow dung, poultry manure, neem cake, groundnut cake, and bone meal are the commonly used organic fertilizers used in grow bag gardening. As mentioned earlier, Krishi Bhavans source cow dung from farmlands in the countryside. Informal sources of cow dung for urban gardeners include farms of their milkmen or neighbors who still rear cattle in the city. A homemaker and rooftop gardener, Padma says, "I need not buy cow dung from the market; we have neighbors rearing cows." Suresh, a rooftop gardener, says, "People need to show willingness and effort. For example, the dry cow dung powder we get in the market may sometimes harden into lumps, making it difficult for plants to absorb. Also, some plants need wet dung. In such cases, whenever I come across wet cattle dung on the way, I collect them. At other times, I apply cow dung and cow urine, which I collect from my neighbor's cattle farm. In return, I share my vegetables with them." Sheeba, a migrant gardener, says, "We migrated to Trivandrum only four years ago. My husband is from Karunagappally. Whenever we visit our hometown, we would bring sacks of cow dung in our car."

Some gardeners who have poultry replace cow dung with poultry manure. 12 gardeners in the study raised poultry. Although rearing poultry is more manageable than raising cattle in the city, many discontinued following attacks on their hens by street dogs. Two participants in this study had set up cages for hens on one part of their rooftops. However, poultry waste has

disadvantages, such as the intense heat-generating capacity. Besides, Sheela, a gardener using poultry waste, says, “I would like to shift to cow dung shortly because of *atta* (bugs) that breed on the poultry waste; they seep through the air holes into the living rooms below.” Gardeners invariably depend on the market for other inputs such as neem cake, bone meal, and groundnut. Besides seeds and fertilisers, urban gardening also involves inputs in the form of lab cultured bio-fertilisers, biopesticides, and biocontrol agents developed by biotechnology. Most gardeners purchased bio fertilizers such as *Pseudomonas fluorescens* (a concentrated bacterial solution/powder that acts as bio fungicide against root rot) and VAM powder (Vesicular arbuscular mycorrhiza, a fungus that enables nutrient uptake by plants); biopesticides such as *Verticillium lecanii* (effective against sap-sucking organisms such as aphids); and biocontrol agents such as *Beauveria* and *Trichoderma* (commonly cultured fungi effective against various fungal diseases affecting plants). These are developed by Krishi Vigyan Kendra and other private agencies and made available through government and private outlets like agro bazaars, farmhouses, agri-horti societies, etc.

As discussed, there are many ways (formal and informal) through which gardeners procure seeds. While only 16 percent procured seeds from the Vellayani College of Agriculture, they trusted and preferred those seeds over the ones from Krishi Bhavans. Besides, many gardeners were on the lookout for seeds of local plant varieties they grew up eating in their childhood but no longer found these days. Above all, sourcing seeds and other inputs connect the urban with the rural as migrant gardeners often travel to their native places from the city in such pursuits. Further, sourcing is a stage in which beyond buyers, gardeners often ‘become’ hunters and gatherers (picking from roadsides, waste dumps) and their cars ‘become’ *Krishi Vandi* (farm trucks).

4.2 Composting Home Waste

In addition to sourcing inputs from outside, urban gardeners make their own fertilizers by composting their household waste. Composting involves institutional support and the ingenuity of gardeners, besides the agency of non-humans such as earthworms and biocontrol agents. Kitchen compost bins, pipe compost, and vermicompost are the three types of institutionally driven composting systems in Thiruvananthapuram. The City Corporation supplies inoculum (adding fast-multiplying bacteria to augment the degradation of solid waste) to enhance kitchen waste composting. Additionally, through various schemes, it has provided biogas plants, the

slurry of which is a good fertilizer. Seventy-year-old George used a kitchen bin and biogas plant. He took me to his kitchen and showed me the kitchen compost bin. He said, “We ensure that we add only dry waste in the kitchen bin. Also, we do not add egg shells or citrus food wastes such as lemon skin and oranges. I have a separate bin (supplied earlier by the corporation) for composting these. We add coir pith and inoculum supplied by a company named Haritha. Wet waste is poured into the biogas plant. The biogas supply lasts for around 45 minutes of cooking time. We don't have vermicomposting.” Another gardener, Radhika Devi, explained her experience with vermicompost: “Inside a tank/ box, earthworms are allowed to breed in wet cow dung under a few layers of jute sacks. The worms feed on the organic waste, including the sack, and compost is ready within some days. However, when my husband’s mother fell ill, I could not feed the worms with organic materials, and soon the worms left the bin. Also, we must protect the worms from red ants.” Few gardeners succeeded with pipe composting despite the corporation’s efforts to popularise it. Only fourteen out of the 150 gardeners used pipe composting. For instance, Sheeba, the gardener, says, “Earlier, we tried pipe composting, but worms spill out of the pipes, especially during monsoon. Some suggest adding lime to pipe compost at regular intervals to prevent worm breeding. However, we were not able to control the breeding of worms. Hence, we stopped pipe composting.” Other gardeners have a similar experience with pipe composting. Ganeshan, a rooftop gardener, says, “Earlier, I had pipe compost. But due to overbreeding of worms and improper follow-up, I stopped. It was not aesthetically appealing to my wife—a pipe compost right in front of our home.” Thus, institutionally designed composting processes such as pipe composting are driven by climate and aesthetics and often thwarted by a non-human agency (here, worms and ants). The overbreeding of worms makes composting an indeterminate process.

Of all the various compost mechanisms, biogas was the most popular. Forty-one gardeners in the study used biogas plants. In the words of Madhusoodhanan, “I was the president of the Poojappura Residents’ Association from 2013-2019, during which time I took up an initiative to help residents set up biogas plants and take up grow bag gardening. We spread the word about subsidized schemes through Whatsapp groups. The Poojapura ward was awarded three times consecutively for actively engaging in source-based waste management. There was a greater uptake of biogas plants relative to grow bag gardening.” However, biogas was not popular in denser residential areas, as it lets out foul smell during the cleaning process. This was reported by a gardener named Nishi Loyi who remembers how many of her fellow residents returned their biogas plants and also persuaded her not to install one because of the odour it emits during cleaning. She adds that whenever she had to apply strong smelling liquids

such as cow urine, she did it late in the night, after everyone had slept, so that by morning the area would not reek of its smell.”

Apart from these institutional mechanisms, gardeners also used their ingenuity in composting. For example, Purushoththaman Nair says, “Corporation authorities are very concerned about waste management. They supplied this kitchen bin; however, we don't need it as we have a ring compost. There are two concrete rings; as one fills, the other will be ready. When we return from a visit to our native place, we bring jackfruit. It takes a longer time to degrade due to the thick skin. One ring is mainly reserved for the jackfruit peels and other thicker stems and their organic parts.” Thus, here, the gardener’s ingenuity lies in customizing the compost facility according to the food type (thick-skinned jackfruit). Shivanandan, another rooftop gardener says, “The kitchen bin supplied by the corporation is not porous. Further, I need to add inoculum every time, which may or may not work. Hence, I bought composting pots with holes for air circulation instead of a closed kitchen bin. Composting requires moisture, warmth, and air circulation to promote bacterial growth for aerobic decomposition. Else, worms infest, and it starts smelling bad. Have you noticed that warm air releases when we lift hay from *vaikol* (haystacks) in farm fields?”

Thus, although composting is an effective way in which household waste can be channelized into fertilizer for grow bag gardening, there are limits to the success of institutional mechanisms of in-situ waste management. Some of these include poor aesthetic appeal due to sensory and visual impact, factors such as monsoon causing overbreeding of worms, ineffectiveness of inoculum, as well as its inability to cater to a wide range of organic material.

4.3 Setting the Soil

Once all the inputs have been gathered, the next step in urban gardening is preparing the soil for planting. As mentioned earlier, as part of the grow bag supply scheme, grow bags filled with potted soil and seedlings reach the gardener through Krishi Bhavans. All that is left for the gardener to do is tend to the plants by watering and managing pests. However, following one harvest, the gardener has to reset the soil and refurnish it with the depleted nutrients. Even otherwise, as mentioned earlier, the quality of soil supplied by Krishi bhavans is poor and most gardeners often reset the soil. In any case, setting/resetting the soil involves the following steps and factors explained by Ashokan, a rooftop gardener: “The first step in setting the soil is solarisation. We solarise the soil to kill the germs in it. In this step, we must spread the soil

where sunlight is available, add lime to remove the acidity of soil, then cover the soil in a transparent plastic sheet and leave it aside for twenty days (see **Figure 4.1**).” According to Suresh, a seasoned gardener, “While setting the soil, I add quicklime and after 21 days, add the other fertilizers. These days I hear quicklime can be replaced with dolomite as it also contains magnesium. However, I am satisfied with the traditional practice of adding lime. I buy clams, sprinkle water on them, and make quick lime. Also, in terrace/rooftop gardening, one spoon of lime per grow bag will suffice. Above all, one must not be hesitant to get one’s hands dirty. I enjoy the touch and smell of soil in my hands” Raj Mohan, a sixty-year-old gardener, highlights the weather factor in solarisation. He says, “Sometimes, due to rain, solarisation is not possible. I lost thirty tomatoes overnight because I couldn't solarise.” Another gardener cautions, “Most of the time, grow bags break during solarisation as we empty the soil from the grow bags by shaking it thoroughly.” Besides, since most gardeners are elderly, and soil setting and resetting is a laborious process, they either replace sand with coir pith which reduces the weight of the grow bag, or, as Sumam, a seventy-year-old gardener says, “Since I am growing old and can’t rely on outsiders to reset the soil in grow bags, I don’t empty the bags. I take out only the topsoil after one harvest, refurnish it, and fill it back into the bag. Thus, my grow bags have a base layer of old soil, followed by *kareela* (dried leaves), then fertilized topsoil (mixed with neem cake, cow dung, and bone meal). Sometimes, I add VAM to the base layer to promote root growth. I also added *Pseudomonas* (5 ml diluted in one-liter water). I add one tablespoon of *Trichoderma* with the fertilized top part whenever I can.” Moreover, as mentioned in the socio-economic profile of the gardeners, women gardeners suffered morbidities such as arthritis. Some older women gardeners therefore, sought the support of their spouses in resetting the soil. For instance, Rama Devi, an elderly gardener sought her husband’s help to empty the growbags, mix the soil and also provide support to climber crops. Hence, from the above narratives it is clear that soil setting depends on age, gender, and weather conditions. The use of the term solarization by gardeners indicate their awareness and know-how regarding scientific methods of soil setting tailored to gardening in urban built structures such as rooftops.

Figure 4.1: Soil Mixed with Lime for Solarization on Rooftop



Source: Fieldwork

4.4 Setting up Grow Bags

Although, as part of the vegetable development programme, the government supplies industrially produced UV sterilized grow bags made of plastic (See **Figure 4.2**), long-term gardeners also make grow bags by repurposing everyday household objects. For instance, N. S. Panikker who has been gardening for more than 8 years says, “I have converted wash basins, helmets, and even an old commode into a grow bag.” (See **Figure 4.3**) Another gardener, Sheeba, says, “Grow bags are made of plastic, but we do not have any other alternative. I have grown tapioca in thick double layered cement sacks, used torn jeans of my children, tea cups, and Milma’s milk packets to grow seedlings whenever possible.”

Some gardeners do not use grow bags at all. For instance, George, an elderly gardener, says, “I removed all the grow bags. These grow bags decay after two years and burning them is harmful. Instead, I raised a bed of sand on top of a plastic sheet.” Given the problems of frequent disposal of grow bags, gardeners are shifting to durable containers. For example, Nishi, a gardener who grows many fruit trees on her terrace, says, “I am moving towards replacing grow bags with plastic drums (one costs 240 rupees). It can be cut into two and used. We have to buy plastic drums as they are more durable. For example, the drums used to store chemicals in the RCC (Regional Cancer Centre) last for a longer time.”

In rooftop gardening, many gardeners take great care while setting up grow bags. Some coat their terrace to prevent leakage. Others arrange the grow bags such that the weight of grow bags is uniformly distributed on the floor. Besides, thirteen gardeners in the study set up stands made of gI (galvanized iron) 14 inches (See **Figure 4.4**) from the terrace floor on top of which they placed their grow bags. For instance, Gopalan Nair (also in **Figure 4.4**), an elderly gardener, says, “An issue that vexed us when the number of grow bags increased was the impact on the terrace. To balance the weight of grow bags, a migrant worker who came to work in our backyard used his ingenuity and made a metallic stand-like structure. Seeing that, we gave orders to scale it up using gI pipes.”

Regarding filling the grow bag, Archana, a gardener, says, “If we fill only sand, soil, and fertilizers, the grow bag becomes heavy and hence difficult to lift and shift. Coir pith or coconut fiber is light and spongy; hence, can hold water within the grow bag. Above all, we must not fill a grow bag to its brim with a potting mixture.”

Thus, the grow bag setting sheds light on gardeners’ concerns such as leakage on the built structure. The gardeners’ search for durable alternatives to plastic grow bags hints at their awareness and concerns such as environmental and health impacts of burning plastic waste. Further, the gardeners take care to keep their grow bags light so as to shift them easily when need be. Therefore, durability of the material, impact on the terrace floor, and weight of the growbag, are some of the factors affecting this process. These concerns enable used urban house-hold objects such as helmets and so on to enter into an assemblage with soil, seeds, water and plants. By becoming growbags, these objects enable life to bloom and bear fruit.

Figure 4.2: Grow Bag Used for Gardening.



Source: Fieldwork

Figure 4.3: Gardener Showing a Helmet Turned into a Grow Bag.



Source: Fieldwork

Figure 4.4: Gardener beside Grow Bags set Upon Galvanized Iron (gI) Pipes.



Source: Fieldwork

4.5 Planting

Planting is the stage that requires conscious and careful engagement on the part of the gardener with seeds and it indicates the way gardeners look at seeds. Most rooftop gardeners in the study used pot trays (see **Figure 4.5**) and cups to sow seeds. Ramesh, a gardener, says, “I do not sow seeds directly. I soak those seeds with a hard cover in a *Pseudomonas* solution and sow them in a potting tray a day after. Then when they reach two leaf stage after four days, I transplant them in the evening into grow bags. Tomato, ladies' fingers, spinach, and brinjal fall in this category. Transplantation must be done after 4 pm.” Sumam, another gardener, adds, “While sowing, I add VAM and Trichoderma (mixed with cow dung). Whenever uprooting and

transplantation are involved, it can be done in the evening, as the plant gets time to settle in the soil overnight. Other saplings raised in cups can be planted anytime as their roots are not disturbed. After preparing the potting mixture, we dig a small *pilla kuzhi* (a baby hole) and place the baby seed/seedling inside this hole. I don't use gloves to plant the seedling. I don't mind getting a little mud in my hands". Therefore, Ramesh symbolically refers to the sowing/planting process as similar to the implantation of a fertilized egg in the uterus. Hence, one can conclude that planting is a stage in which seedlings 'become' babies in the womb of the earth.

The Wonder of Spontaneity

Not all plants in the home garden are planted consciously. Some spring up on their own from kitchen waste dumps or within the garden, alongside other plants. Also, after the first time, some plants carry their lives forward without any special tending from the gardener. These are plants that gardeners say '*thaniye podichu*' which means they have sprouted spontaneously. Spinach, papaya, cucumber, and bitter gourd, belong to this category. It is the agency of plants along with that of humans that make the garden a spontaneous world, not just a predetermined curated world. Alongside the world of conscious engagement, there is always room for spontaneity, and indeterminacy as mentioned earlier in the section on sourcing. As I climbed to an elderly gardener, Radhika Devi's rooftop, she pointed to the spinach and remarked, "These are not planted, they spring up on their own. Perhaps they sprouted from fallen seeds of old plants. Here, look at this grow bag, what I planted was ladies' finger, but spinach has erupted alongside it. In any case, they are always there on my rooftop. Omnipresent". Likewise, Malathy, an eighty-year-old gardener says, "Spinach is like a friend; you do not have to plant it every time. If you have planted a few initially, new plants spring here and there from the fallen seeds of older ones. It is in a way self-promoting. It is the same *manithakkali* (black nightshade plant)." Rema, another gardener remarks, "Look at this *thumba* (medicinal herb). It has been growing wild since I planted them for my daughter's post-delivery care. According to ayurvedic practice, new mothers are given the extract of the *thumba* in the first three days after giving childbirth. Now they have spread like weeds and I have given them an ultimatum to stop growing, or else I am chopping them off. It is a forest of *thumba* now. It sprouts everywhere possible, even on top of the gate, from seeds that may have been carried by the wind from the rooftop."

As Mabey (2010) puts it, "In both rural and urban spaces, plants are allocated places, becoming weeds when they have 'contempt for boundaries'" (Mabey, 2010, p. 82). As plants move across

time and space they become ‘aliens’, ‘invaders’ or ‘weeds’ in their new territories” (Head et al., 2014, p. 863). Deleuze & Guattari (1987) call it “The wisdom of the plants: even when they have roots, there is always an outside where they form a rhizome with something else—with the wind, an animal, human beings” (Deleuze & Guattari, 1987, p. 11). Besides, sowing is also a stage where non-human agency comes into play. For instance, “Beetles and wasps roam around eating away all tiny seedlings. One day a crow stole away the seeds that I had kept for sowing,” says Jumaila, a rooftop gardener. Thus, sowing indicates that rooftop is a shared and contested space as plants compete for space, often thwarting gardeners’ plans.

Figure 4.5: Seedlings Raised in a Pot Tray.



Source: Fieldwork

4.6 Tending

Tending to a garden is not mere supply of nutrients and water. It is what Kimmerer (2018) calls act of “intimacy” (Kimmerer, 2013, p. 296). “Care and affection are the cornerstones of human-plant engagements. Gardening is caretaking” (Miller, 2019, p. 90). There are three aspects in tending. One aspect involves treating and recognizing plants as “children with agentic capacities” (Miller, 2019, p. 90). Urban home gardeners in Thiruvananthapuram speak to plants and plants respond to them. The second involves the caretaker’s irreplaceability, which is the claim that care for plants can’t be outsourced. Thirdly, it also involves a *manasu* (heart) that has a love for plants, which makes it not everyone’s cup of tea. Tending to plants in the garden

involves a daily visit to the terrace, at least twice a day, spending at least an hour each time, watering the plants, weeding, pest management, and feeding the plant with nutrients. Most importantly, it is through tending that gardeners become parents and plants ‘become’ their children. As a result, boundaries such nature/culture; human/non-human become blurred. Following section details people-plant kinship in urban home gardening.

Figure 4.6: Gardener looking at her Plant with Affection



Source: Fieldwork

4.6.1 People-Plant Kinship: Becoming Parents, Becoming Children

“Procreation alone is not kinship, it needs to fulfil the condition of extended temporality as in the case of parental care,” (Sahlins, 2011, p. 5). “Every night I sleep thinking of what to plant the next day and I wake up to check on them first thing in the morning. It is very much like caring for a baby. It is like getting ready to feed the baby as soon as he wakes up from sleep,” says Archana, a fifty-six-year-old gardener. Likewise, sixty-six-year-old Ganeshan says, “Besides the right environment, we need the right attitudes; for instance, people must have the willingness to wake up early, and to care for the plants, to not let the plants die. In other words, we must love them.”

Rajagopalan Nair, a sixty-two-year-old gardener, narrates his daily routine, “I wake up at 5.am. After brushing and having tea, I climb to the rooftop, check on the plants for pests, or any diseases, and remove affected parts. It is important not to postpone the removal of affected leaves because, by the next day, the disease would have spread to other parts, and it will become difficult to manage. Everyday monitoring is essential. Once a week I apply fertilizers. Even if we skip watering for a day, the plant starts drying. Once we start *Krishhi* (gardening), we can’t leave them to go elsewhere. It is like growing animals. Once you get a hang of gardening, you keep wanting to continue. It is like raising one’s own children. When we do it on our own, we feel *mamatha* (motherly affection).” Thus, routine and rhythm such as timely visits, watering and feeding the plant with nutrients for growth is an essential aspect of gardening which makes it an everyday practice. Other than these acts of timely visits to the rooftop, and providing nutrients and watering, there are other forms of engagement in which both plants and people animate each other such as talking with plants.

4.6.2 Talking with and for Plants

It is “an activity that is mutually responsive and develops into mutual responsibility” (Bird-David, 1999, p. 77). “Kinship is the mutuality of being” (Sahlins, 2011). “To be kin in that sense is to be responsible to and for each other, human and not” (Haraway, 2010, p. 54). For instance, gardeners argued that they had obligations to plants, and the latter had obligations to bear fruit in return. Often conversations between gardeners and plants take the form of persuading or demanding the latter to bloom or bear fruits in return for the former caring without fail. This is illustrated by the following narratives of gardeners recounting their conversation with plants.

Atiya Farheen

Atiya Farheen (43 years), a migrant gardener says, “We have to take care of plants like we take care of babies, or else we feel sad when they die. Once we lost two brinjals to stormy weather, just when they were transitioning from the bud to the fruiting stage. It felt like a pregnant mother losing her babies. People may consider me crazy but I talk to my plants. There was a rose plant that was not blooming for long. Everyone at home argued that roses purchased from nurseries are hopeless. However, I didn't give up. Like I do today, I would collect vegetable and fruit peels, make them into a fine paste in a mixer jar and apply them to the plant. I would then ask the rose to bloom soon. I would stroke her stem and ask her, ‘Why don't you bloom? Can't you hear what everyone is saying about you? You must bloom for all to see.’ You won't believe me but within a week, it blossomed into a beautiful flower. I believe plants can listen

to us if we speak to them. No matter who mocks me, I think plants know, they understand. I could stand losing my ancestral home, but what pained me more was losing the trees that were there. Like the rose here, there was a gooseberry plant growing near a coconut palm in my home town. I loved to keep its leaves in my hair. As it was not bearing any fruit for long, people often made fun of me, saying, ‘All your life, you will have time only to sweep its leaves, better cut off the tree.’ Then I began praying to the tree every day, ‘Dear child, please don’t let them cut you off, please give me a fruit.’ Within three years exactly three fruits were born for the first time. From then till date, it bears fruits every year, be it rain or sun and it bears enough for people to collect in big shopper bags. Even now, when I visit that place, I hear the neighbours say that even today, people would jump over the fence to pluck them. The gooseberry is tiny but tastes like honey.”

Jumaila, another gardener says, “I share seeds with my friends; sometimes, those seeds sprout in their garden but fail in mine. At such times, I speak to my plants; at times I threaten to chop them if they don’t bloom. Two days later they bloom.” Hence, we see that when gardeners talk with plants, the communication takes the form of reproach. As Das (2018) notes, the aesthetics of kinship involves reproach. “To express a reproach is also to express love; rather, the reproach is a particular moment in the give and take of love” (Das, 2018, p. 539).

Lekshmi, an advocate and gardener, talks about the magic of a touch and shake. Among vegetables, tomatoes are her favourite. In her words, “I love tomatoes as they bear fruit within two months. A month after planting tomatoes, you need to shake them. I don’t know why, but there is magic to it. Soon enough it will bear fruits. That has been my experience. Pear, cherries, grapes, and tomatoes grow very fast in my soil.” Jayasree, a homemaker and gardener, says, “*Champakam* (*Magnolia champaca*) is my weakness. I found her from the roadside almost fifteen years ago. This is the first plant I brought home and I believe she is my lucky plant. I tell all my stories to *champakam*.”

Sumam, an elderly gardener, says, “Everyone in my family is up against me for spending all my time with plants. They say plants are my children.”

“Continuous attention is required for organic gardening,” says Padma, a homemaker and gardener. She continues, “If you apply chemical pesticides, you need not attend. I talk to the plants and feel heard, understood, and consoled. The growth of a small plant step by step gives me a sense of wonder. Have you noticed small children have the habit of plucking roadside flowers while they walk by them? If it continues every day, the plant slowly withdraws over time. Similarly, if you scold a plant that has not been bearing fruits, it will start blooming. There is a mango tree in my front yard, which was not bearing fruits for years. During the training

class conducted by Rajendran sir, I raised this problem, hoping he would suggest a remedy. He told me that plants also sleep after sunset. He asked me to shake and wake the plant and talk to it at that time. ‘Threaten the plant by cutting it down if it doesn't bear fruits,’ he said. Everybody laughed at this suggestion. However, my daughter did this to the mango tree and within a few months, it bore the largest number of mangoes ever. Likewise, my neighbour also shared a similar experience with a plant of hers that bloomed after a week of scolding it. These days people also suggest tying the bark with a rope forming a *mothira valayam* (ring) to awaken it and help in blooming. Continuous interaction is important.” Maya, a gardener, emphatically says, “We need to talk to plants. Plants have life as proven by J C Bose. Just like we observe our children’s feelings and movement, if you observe plants well, we can see their minute changes.”

Shyamala, a gardener recalls, “While I was working, I had domestic help. I always reminded her not to pluck any fruits or leaves but cut them, if required using a knife or scissors. This is because when we pluck the leaves from tiny plants, the roots may get disturbed by the force applied. Also, I would ask her to water my plants, just like giving a bath to our own children. The truth is that we need to take care of plants just like we take care of our children. Giving birth is not sufficient; raising them is important. Likewise, you can't expect to sow a seed and visit it next at the time of picking the fruit. This is the case with pet animals. I had a dog named Ponnu. I adopted her from the street. She had no tail and wouldn't bark for a month. My husband and son mocked me saying, ‘Look, mom picked a dog that is deaf and mute.’ One night I heard a faint bark and ran downstairs. Ponnu barked. She was very obedient. She wouldn't touch her food unless I told her to. I used to let her out of her cage when I had to go out. She would lock the gate by herself using her nose when my car had passed the gate. When I got back, she would get into the cage by herself. Similarly, if you love your plants, they will love you more than you do. Now most of my drumstick leans over to the neighbour’s fence. Occasionally, I cut it down whenever they complain. Once they cut down a whole branch that was close to my side of the boundary without consulting me. I felt very bad. It was their maid who did it recklessly. I told them that harming my plants is like harming my children. Neighbours are of different types. Some are very kind and friendly. Others are selfish.”

“Love for plants is necessary, and a little effort every day would suffice to maintain a garden. There have been times when we returned home very late. Although it was midnight, I first ran to the terrace to water my plants, worrying that they would dry up. We were away for two days to attend a relative’s funeral ceremony. Look, this *puthina* (mint) dried up in our absence,” says Purushoththaman Nair. Therefore, we see that just like gardeners’ pleas animate the plants to

bloom, through acts of wilting, drooping and drying, plants in turn move the gardeners to act and elicit care from them.

“Plant is a living being just like us, says Seema, an agricultural officer and a home gardener. She continues, “I make it a point to engage my kids while I am gardening. Recently, I tried growing onions in my grow bags. They sprouted and were picking up well. However, one day, when I went home from work, I found all the leaves chopped from above. I found out later that my son had chopped them with scissors. Although furious, I sat with him and explained that the plant body is also like the human body, chopping its leaves is like chopping off a human head.”

Nishi Loyi, a gardener who lost her father recently, recalled, “My dad was very fond of plantain. His favourite is *padati*. All day long he could be found tending to bananas. When he was lying on his deathbed in the ICU, he called me closer and told me to take care of his plantains. He recalled that there were eleven of them, and one was ripe enough to cut. The day we brought his body home, that plantain fell suddenly with a big bang.”

Another gardener, Jyoti, says “I believe it takes a good heart to be able to grow plants or engage in agriculture. Gardening is for those with a humane quality in them, not for profit seekers. It takes kindness to be able to nurture and care for another.”

Paul, a retired agricultural scientist, and home gardener says “There is a saying in Malayalam *Pullu thane valarum, nellu krishi cheyyanam* (grass grows on its own, grain has to be cultivated). Plants influence us and we influence them. For instance, I have a plot of coconut palms. I have a mental picture of each of my plants in my garden. Some do not bear any fruits despite much care. Our involvement is inevitable. I remember a line in our graduate textbook that reads thus: ‘Owners’ supervision is the best medicine.’ Besides, J.C. Bose noted that music induces flowering in plants. We can’t decode their language. Perhaps they can decode ours.”

“I can’t expect anyone else to take care of my plants the way I do. It (care) is not replaceable. Can a child’s mother be replaced by someone else? The way your mother marks a dot on your forehead is not the same as someone else doing it, is it?” asks Asokan, a home gardener and an artist. Thus, he points towards the second aspect of tending, the irreplaceability of the caretaker. Arjunan, a political activist and gardener says, “Sometimes, I get busy in the evenings. My wife helps at such times and does the watering. However, I do not trust anyone else to take care of my plants. Once we had to be away for a long time and entrusted a person. He ended up watering plants like servicing a car: flushing out and raining a pipe full of water. As a result, the soil also got splashed out with the water.” Another gardener Jayasree also speaks along the same lines. She says “I do not employ others to help me in gardening. *Thripathiyilla* (I am not

satisfied). *Njan care cheythale enik ishtamullu* (I like to care for my plants by myself). I wake up in the morning at four and finish most of my household chores by seven. Then I attend to my quails, hens, and garden. By eleven, I get back to the kitchen. Recently, I had my uterus removed. Hence, I could not attend to my plants for the past few months. At that point, I installed drip irrigation, which automatically irrigates the plants thrice a day. In 2015-16, there was a severe drought in the city, and the water supply was reduced drastically. Most of my plants, fishes, hens, and ducks became weak and died. I became heartbroken. It felt like I lost my own children.”

Tending to the plants on their rooftops creates the “tiny scale contexts in which relations encounter and animate one another” (Astor-Aguilera & Harvey, 2018, p 7). “Culture is not something we find similarly operating in far distant species (evolutionarily speaking) but something we only achieved through entanglements with proximate ones” (Hartigan, 2015, p. 22). By referring to J. C Bose, gardeners time and again are alluding to the ways in which sentience is not exclusive to humans. Tending is a recognition of this sentience and forging kinship with plants. When gardeners say plants are their children, what we as anthropologists must do, following the ontological turn, is to “rethink first of all the operative distinction” (Holbraad & Pederson, 2017) between humans (children) and non-humans (here, plants) which defines our ideas about what a plant is or what a child is. As Isabelle Stengers (2012) puts it:

It’s wrong to think that the Virgin Mary could make her existence known independently of the faith and trust of pilgrims; for her to do so in a situation committed to the question of how to represent her would be in bad taste. Rather, if we accept that that aim of a pilgrimage is the transformative experience of the pilgrim, we must not require the Virgin Mary to “demonstrate” her existence to prove she is not merely a “fiction.” We must not, in other words, mobilize the categories of superstition, belief, or symbolic efficacy in an attempt to explain away what pilgrims claim to experience. Instead, we must conclude that the Virgin Mary requires a milieu that does not answer to scientific demands (p. 3).

Similarly, it is both bad taste and simplistic to state that gardeners ‘believe’ that their plants are their children or that their plants ‘really’ listen to and understand them. This is because, as Stengers argues in the case of the Virgin Mary, we can’t make the agency of plants as children visible outside of the care and love of gardeners as parents. Thus, following Stengers, we need

to accept that the aim of gardening, like pilgrimage, is the transformative experience for both gardeners and plants caught in a milieu of kinship. Thus, what is real is the transformation itself, not what they are transformed into. In other words, as Deleuze puts it, “what is real is the block of becoming itself” (Deleuze & Guattari, 1987, p. 238). If animation is taken to mean to move, an affect, then plant animates the gardener as much as the gardeners’ pleas animate the plant to become parents and children respectively. Therefore, gardening emerges as an animistic performance of kinship.

4.6.3 Watering and Irrigation

Most gardeners prefer to water their plants by themselves. Some gardeners go to great lengths to provide good quality water to plants. For instance, Purushoththaman Nair says, “Instead of pipes, we have a water tank on the rooftop. The tank is filled with well water. Well water is better than pipe water. It is chlorine free.” Those gardeners who did not have a well, used rainwater harvesting to water their plants. For instance, Malathy, an eighty-year-old gardener, said, “We have set up a rainwater harvesting system, given the lack of space to dig wells in the city. Rainwater is pumped up to the tank on this side of the terrace. There is a huge difference between pipe water (chlorinated) and rainwater. The latter is healthier for plants.” The government introduced and supplied drip and wick irrigation technology as part of grow bag distribution. However, only a few gardeners reported using these. Also, many of those who used it have discontinued it for various reasons. For instance, Prasannan says, “I have not installed drip. Drip reduces labour; however, watering with hands helps us maintain a close relationship with plants.” Padma Suresh says, “I don't use drip irrigation. Manual watering is an exercise, and I get to be with plants, in proximity, talk to them, and enjoy being with them.” Asokan, a gardener, says, “We tried drip irrigation (see figure). However, sometimes it doesn't differentiate between plants that need more water and those that need less. Also, I like to water my plants myself; it gives a feeling of being close to them.” Paul, another gardener, says, “For a while, the drip was working well until the tubes began leaking. When I checked, the tubes were broken here and there. I replaced them only to find the new lot also broken similarly. It took a while to realise that it was the doing of civets. At another time, the timer of the drip stopped working. The advantage of digital drip was that plants would be irrigated in our absence. However, these tubes face frequent trouble clogging and breaking due to animal attacks.”

Some gardeners experiment with wick irrigation technology. For example, Gopalakrishnan Nair, a seventy-year-old gardener, who recently took to wick irrigation, took me to his rooftop and explained how a wick-based irrigation system works. He pointed to the long lines of PVC (Poly Vinyl Chloride) pipes in which holes are drilled at regular intervals (see **Figure 4.7**). He said, “A wick is inserted into the holes in such a way that the bottom of it is immersed in the water that runs through the pipe and its remaining portion continues inside the grow bag. The wick absorbs the water in the pipe and makes sure that the soil is moist at all times.” However, Sreekumari, a long-term gardener, shares her experience with wick irrigation as follows: “The problem with wick irrigation is that it works best with plants with lesser roots. In case of ladies’ finger, brinjal, and peas, their thick roots get entangled with the wick, preventing it from absorbing water from the tube. Cabbage, cauliflower, tomatoes, mint, and spinach have lesser roots.” Thus, it is clear that although gardeners experimented with irrigation technology, they preferred manual watering as it was an essential aspect of tending, which is feeding their plant children, connecting with them and being with them in close contact.

Figure 4.7: Gardener Showing the Mechanism of Wick Irrigation



Source: Fieldwork

4.6.4 ‘Pest’ Management

Most gardeners in the study stated that when compared to the ground, on the terrace, pests are relatively fewer. However, the attitudes and methods of pest management vary according to the gardeners. Just like the parent-child relationship that emerges between gardeners and their plants, gardeners develop different forms of relationships with pests, ranging from taking active and passive measures to eliminate them, and to distance and embrace them as beings with a

right to garden produce. Likewise, pests develop kinship with plants on rooftop gardens and pest management is a mixture of selectively allowing and disallowing these kinships as reflected in the following narratives.

Ant-Aphid partnership and Peas

Pointing to the aphids around a cowpea plant, Sreekumar, a rooftop gardener says, “Look, this is *munja* (a very powerful *keedam* (pest) attacking cowpea). I have learned that ants carry them to the cowpea. I remember purchasing a pesticide, especially for cowpea for protection from the *munja*. Regardless of the availability of organic pesticides, their effectiveness fades over time and we need to use a variety of them, alternating one with another. Neem-based pesticides are more effective.” Radhika says, “I allow red ants to grow; they eat the aphids that attack cowpea.” Thus, while Sreekumar preferred a direct intervention and had complaints about the effectiveness of organic pesticides, Radhika preferred to allow nature’s food chain to take its course through raising red ants and not bothering herself with applying biopesticides. Jayadevan, another gardener who has been gardening for the past ten years, says, “There are no paddy fields today. Perhaps, *munja* (Aphids) have crossed over from paddy to peas. Overnight, it colonizes the pea plant. I have observed that if we stop watering the pea plant for a while, aphids do not attack. It is because they are deprived of the juice that they suck from the tender peas. It is either better to limit water supply to peas in a controlled manner to prevent aphid attack. The other alternative is to spray chemicals, which makes organic gardening pointless.” As Haraway (1992) puts it, “Nature can be a social partner, a social agent with a history, a conversant in a discourse where all of the actors are not “us” (humans)” (Haraway, 1992, p. 83). When Jayadevan talks about aphids crossing over from their association with paddy to their association with pea on the rooftop, aphid acts as a social agent with a history. Paddy here enters the discourse as a missing partner. Thus, pest management alludes to the kinship of pests with plants, both old and new and gardeners attempts to deal with them.

Two gardeners Rema and Maya discussed the snail problem. “Apply salt,” says Rema. “Every day, I am tired of killing these snails by applying salt. Snails keep coming in the evening; perhaps it is the cold weather,” says Maya. Padmaja opines, “Nowadays people talk of buying organic pesticides from the market such as *Beuvaria*, *Pseudomonas*, and so on. Instead, I advocate using the things available in our own home. I use *kanjiram*, and neem leaf extract and spray the diluted mixture. Fish amino is both an organic hormone and bio-pesticide (*jaiva keedanashini*). *Chazhy* is the sap-sucking pest commonly found in peas and beans. Fish amino is effective against *chazhy*. Take 1 kg *mathi* (local fish variety) and 1.5 kg jaggery without adding water. Keep it aside for 45 days with occasional stirring. Also, it is believed that

plantains attract snails.” In this manner, gardeners like Padmaja used home remedies for pest management instead of depending on market-based solutions. Archana, a long-term gardener says, “I hate using pesticides, even biopesticides; instead, I use cow urine and *kanthari* (native chilli). Most often it is mechanical pest management that I rely on. Pest management reflects people’s mentality. Some are very diligent in preparing and spraying them at the right time; either early in the morning or late evening. However, I am a little lazy. I am fine with picking the pests by my own hands; sometimes, I let them eat some.” Mini says, “Early morning, I come and spray rice water. Today I found out that there are yellow worms beneath the bitter gourd leaves. I killed three of them. I wrapped them in the leaves and pressed them. I didn’t kill them out of anger for spoiling my plants; instead, I wished them a better life and squeezed. I gave them nirvana,” Such statements reflect the fact that gardeners often considered the act of killing other living organisms as a necessary evil, rather than an enjoyable act. Latha, a home gardener, says, “I am totally against spraying chemical pesticides, even though sometimes my husband suggests adding a little. The peas in my garden caught white fungal infestation and despite applying bio-pesticides, they failed to survive. I try to engage in mechanical pest management, picking and destroying them away. Climate change is an issue. This time the rains were heavy, and I lost most of my spinach and coriander.”

Some gardeners take a more-than-human stance with respect to pest management. For instance, Sumathi, an elderly gardener points out, “The place where this house sits was once upon a time paddy field. As we cleared those lands for building homes, many of the pests that lived off the fields can be found here around in the garden and premises. Their habitat has been destroyed, where else will they go?” Thus, by taking a more-than-human perspective, Sumathi points out that ecological knowledge can be held by non-humans, when they come back to the same places, now transformed for new purposes, from paddy lands to homes and rooftops.

Sunila, another rooftop gardener, says, “When I go up to my terrace time flies by and I have a lot of birds as my friends. I treat them as friends and so do not bother myself with spraying *marunnu* (pesticides). *Kure avar thinnatte* (let them have their share).” Anandan, another gardener, holds a similar view. He says, “We are happy to share with neighbours and our bird and animal friends that visit our garden every day. The palm civet (*marapatty*), a nocturnal animal, has made my rooftop its home, visiting every night, and eating away some fruits and vegetables. There are a variety of birds here thanks to our garden. Earlier they used to be afraid of our presence. I even talk to them. Over a period of time, they have grown familiar to us and now take us for granted! Our attitude to pests also matters. For instance, when I see a bird eating away my cowpea, I persuade him gently saying, ‘Eat it, but spare a little for sowing in

the next season.’ On the other hand, there are people who might shoo the same bird away, grumbling that he is eating away all their crops. Such an attitude can hinder the sustainability of the process as these people may feel dejected with frequent pest attacks.” Thus, sometimes pests teach gardeners to follow ethics of living in a shared world and give up control.

4.7 Picking

Rooftop gardening involves many vegetables and fruits whose growth and maturing cycles are different. For instance, spinach is the first crop ready to harvest in 45 days, while tomatoes take two and a half months. On the other hand, brinjal and ladies’ finger, and cowpea take three months. Climbers like cucumber, bitter gourd and snake gourd take three–four months. Root vegetables such as yam, tapioca, and spices such as ginger and turmeric take six months. Gardeners look forward to the fruit bearing stage and exercise care in the process. “Picking fruits must be done in the morning,” says Rema an elderly gardener. “Every morning two persons contest for picking *payar* (cowpea)—myself and the parakeets. I reach at 6:00 am, the parrots come at around 6:30 am,” laughs Rema. “What is the best part of gardening?” I asked Shyamala, a long-term gardener, to which she replied, “Of course, blooming and fruiting. When you see so many things fruited around you, your efforts bear fruit—that is what you see in them.” “However,” she cautioned, “In case you want to save seeds for sowing next time, don’t take the seeds of the first fruit, last fruit, uppermost or lowermost fruit. Take the middle fruit. Any disorders or problems with the plant will be manifested in its first fruit. Besides, cut the fruit using scissors. Don’t pluck it for it may cause root disturbance. Don’t let the vegetable, (for instance lady’s-finger) ripen on the plant. Pick when they are tender and keep in the shade to mature. Don’t pick fruits that are eaten or pecked by birds.” Other gardeners also shared their excitement of plants blooming. For instance, Radha, a gardener recalls, “I have tried growing beetroot. I got a very tiny beet. I used to cook beetroot but I had never eaten beetroot leaf *thoran* (a dish made of vegetables and grated coconut). When I was surfing through the seeds in Krishi Kendra, I spotted beetroot leaves. I bought them and planted them inside one of my drums, allowing for deep-root development. The leaves were similar to palak except for a red tinge. I couldn’t contain my excitement. They were very inviting and I plucked a few of them and made *thoran*. It tasted very good. However, the beetroot never came.” Jayasree says, “I do not pick any *sapota* (Manilkara zapota) from my *sapota* tree. I leave it for the parrots, bats and other birds to eat.” George, a retired agricultural scientist and rooftop gardener, says, “we need to

pluck mature leaves. There is no point in allowing leaves to grow luxuriantly. Lopping is essential for providing the stress required to change from the vegetative to the reproductive phase. Haven't you noticed that it is not incessant rain that helps them bear fruits, but rain followed by a period of heat and stress?"

Jambavathi's Snake-gourd fame

Jambavathi and her brother are ardent rooftop gardeners. They fondly recalled how a snake gourd made them popular: "Last year, our garden snake gourd (3m long) was featured in vernacular magazines like *Krishi Jagaran*, *Kerala Karshakan*, and *Karshakasree*." Jambavathi, a sixty-three-years-old gardener, continued to narrate the story of the bottle gourd. "I had asked my brother for *kutti* (shrub-like, small) snake gourd seeds. One day he got a few seeds from a friend he met outside *Krishi Mitra* (an agri input retailer). We sowed five, of which only two sprouted. Of the two, only one picked up growth. Besides, we had to replant it later. And to top it all, the saplings showed root rot, and I removed the affected part and covered it with *Pseudomonas*. We sowed around early January. By the first week of March, a curved and tiny gourd grew. I then tied a stone to its curled end and covered them with newspaper, which is the common practice to prevent the gourd from curling up. Within four days, it grew more than 2.5 metres long, and soon it looked like a snake hanging from our rooftop." "It had a nice smell," recalled Jambavathi's brother. "Towards the end, when we had to be away for a day-long class at KVK (*Krishi Vigyan Kendra*), it wilted due to lack of attention. As this bottle gourd became famous, we began getting requests for seeds from people across the state including from one agricultural scientist from Mannuthy, Thrissur. He reported that he got a 1.5 m long gourd." Thus, stories of extraordinary harvest earned fame and glory for many rooftop gardeners like Jambavathi and they cherish memories of those times.

4.8 Sharing and Marketing: Becoming Organic Farmers, Becoming a Family-People-People Kinship

Most gardeners used social media such as WhatsApp to share the pictures of daily harvest. For instance, Rajalakshmi, a rooftop gardener, shared a picture of ivy gourd harvest on her whatsapp status (see **Figure 4.8**). By labelling it as "today's happiness" she reiterates the fact that gardening is a source of joy she wishes to share with the world.

Figure 4.8: Gardener's Whatsapp Status of Vegetable Harvest



Source: Fieldwork

Seventy-five per cent of the total gardeners interviewed in the study consumed what they produced at home. All of them reported self-consumption besides sharing their garden produce with their neighbours and friends occasionally. However, some gardeners who are left with excess have formed organic marketing communities where they can sell their home-grown vegetables and fruits. Two such weekly organic markets were successfully running at the time of this study. One was Swadeshi Karshika Vipani, run by a group called Krishi Kutumbam (farm family) at a place called Thycaud, on the premises of an NGO called Gandhi Bhavan, every Saturday. The other was Krishi Bhumi, run by a group of the same name at the parking lot of a residential colony called Pillaveedu Lane every Sunday. The perspectives of administrators of both these markets and the perspectives of sellers and buyers in these markets are detailed below.

4.8.1 Harikumar, Founder of Krishi Bhumi Group

Harikumar is a soft spoken sixty-six-year-old man. Everyone in the Krishi Kutumbam group fondly calls him Harikumar Sir. He recalled his journey into organic gardening and subsequent founding of the gardeners' group as an unplanned one. He began, "The year I retired, there was increased awareness about pesticide use in agriculture, urban waste, and the government took various measures. One was the Urban Environment Improvement Programme (UEIP),

implemented by the Kerala Irrigation Infrastructure Development Corporation at Kumarapuram. At a subsidised rate, we got fertilisers, biogas plants, saplings, grow bags, aquaponics set-up and so on. The members of the scheme were added to a WhatsApp group named UEIP. The group was not very active. I took the initiative to call for a meeting of interested group members. Some people met at the museum ground and exchanged seeds. From 15 members who first attended the meeting, we are now a gardening community of 150 people. There are strict rules of communication which every member is expected to follow. Only topics and doubts regarding gardening can be discussed. Two members who posted unnecessary comments have been suspended for a week. Hence, we have 148 active members as of now. When the membership reached 50, many people reported having left-over vegetables. It is because most of us are getting older and live in a family of two. There is a limit to self-consumption. There were only two options left for us: share the garden produce with neighbours, which is often difficult for the latter as they are hesitant to take it for free, or may already have cooked the same kind of vegetable that day and so on; hence politely refuse. The next is to sell in the local markets at prices lower than market rates. At this juncture, we thought of setting up a weekly market. We thought of meeting at someone's home initially. Then, I got in touch with the Facebook group Krishi Bhumi, an online community of over 2 lakh members. With the help of some of the members, we found a venue at LIC lane. It was the premise of a member's home. However, we could only continue there for a short time as we had to move out once new tenants moved in. Upon the suggestion of some of our regular customers, who came from a nearby place called Pillaveedu Nagar, we shifted to Pillaveedu Lane. The residents of this locality were cooperative and allowed us to use their parking lots to set up the market. We rented tables for members to place the produce. The user charge per table is 15 rupees. For the past 88 weeks, we have been selling at Pillaveedu Nagar every Sunday. (See *Figure 4.9*). In the beginning, we had to advertise; now the market is famous. Often, we are unable to meet the demands of the customers. Sometimes, people complain that chillies are not available. We can always buy chillies from Chalai Market all year round, but organically grown chillies are always susceptible to leaf curling due to viral disease, especially in the rainy season. Hence, we do not sell everything at all times like a conventional market. The majority of buyers are doctors and qualified professionals. Our market aims for two things: a) To provide quality organic produce at reasonable prices to consumers. We know that many shops are selling at exorbitant prices in the name of 'organic'. We want to make organic food accessible to the commoner; b) To fetch a fair price for farmers and eliminate intermediaries in the market for organic products. Besides, we also supply grow bags at a subsidised rate of 11 rupees, whereas

the market price is 18 rupees. Those with FSSAI (Food Safety and Standards Authority of India) certification can sell homemade processed snacks and beverages like tea. Apart from publishing reports of pesticide residue, the government does nothing to ban the sale of such products or check the process. Moreover, any action on the part of the government takes time. On the other hand, if we get any suspicions regarding the authenticity of any 'organic' pesticide, we get it tested immediately through our scientist acquaintance informally and ask our members not to use them.

Membership in our organic market is based on the farmer's self-declaration. We have strict boundaries as to who is allowed to sell what. This market is not for business or profit-minded persons. It is more of a social gathering. Most members are educated, qualified professionals such as anesthesiologists, retired agriculture college professors, school teachers, etc. Consumers are mostly doctors, who are very keen on taking care of their health. The market is composed of the upper-middle class; we can say as most of them own cars, both buyers and sellers.

Earlier, gardeners were hesitant to sell their products to each other, stand at the table, etc. Now they have overcome those inhibitions. Their background and social status are such that they felt embarrassed initially. We set the table at 8:30. From 8:30 to 9:30, members can sell their products to each other. From 9:30 to 10:00, we have a break. This is when customers arrive, and seeing us sell to each other may create ill feelings among people eagerly coming to the market. At 10:00 a.m., the market opens to the public. Within half an hour, all items are sold and we pack up." Thus, Harikumar's account shows how being a member of a Whatsapp group that began as part of a government-initiated project helped him connect with like-minded gardeners in the city and in a few months' time they organized themselves into a marketing community. It also shows that marketing of organic produce is an area where government support is lacking. This is perhaps due to the assumption that rooftop gardeners consume all the produce for themselves.

Figure 4.9: Gardeners at Krishi Bhumi Organic Market (left). Price List of Fruits and Vegetables (right).



Source: Fieldwork

4.8.2 Anitha, Founder of Swadeshi Karshika Vipani

Just like the Krishi Kutumbam group, which first began as an online community, the members of Swadeshi Karshika Vipani too were originally members of a Facebook group. As Anitha, the founder, recalls, “A few years ago, a Facebook group organized an organic gardening class in the city. It was an opportunity to meet like-minded people. Rather than relying on others and waiting for the next gathering, some of us decided to meet frequently. We need seeds, but in the case of terrace gardening, most often we find ourselves with excess seeds which we could exchange with other gardeners if we formed a community that would meet often. We first formed a WhatsApp group that occasionally met in various parts of the city. Later we created a Facebook group for ourselves named Krishi Kutumbam. Gradually, we found ourselves left with surplus vegetables from gardening. During one Onam, we met and exchanged not only seeds but also our garden produce amongst each other like in a barter system. Some of the items were sold to the general public too. That is when the idea of a weekly organic market came up. For space, and organizational support we approached the NGO, Gandhi Bhavan. Gandhi Bhavan had been long supporting agriculture by setting up a nursery on its premises and

supplying saplings free of cost to those interested in gardening. They allowed a part of the premises to be used as a marketplace for Krishi Kutumbam members.

Meanwhile, with the help of the Farm Journalist Forum, we registered ourselves as a charitable society named Thiruvananthapuram Karshaka Kootayma. We also have the support of the Indian Agricultural Association (IAA). Thus, this market (Swadeshi Karshika Vipani) collaborates with four organizations, namely Krishi kutumbam, Gandhi Bhavan, Farm Journalist Forum, and Indian Agricultural Association and has been successfully running for one year now. Swadeshi Karshika Vipani became a local market devoid of middlemen, where customers can directly buy homegrown poison-free organic vegetables and homemade food from the producers. Thus, it supports organic farmers by fetching them a market and fair price. Every Saturday for the past one year, we have been running this market successfully. We hold classes on organic farming at regular intervals. City life is such that people don't know the person living in the next lane. Hence, they have to travel to places like agro bazaars to buy cow dung and other essential inputs. Herein comes the advantage of a group like ours. Here when people meet, they discover that they live close by and begin a relationship wherein they start visiting each other's homes, sharing their cattle dung and poultry waste with each other and so on. This market, therefore, also serves as a networking zone to enable enthusiastic organic gardeners to reduce their input costs. Many gardeners who have excess can packet their fertilizers and sell them here. Information regarding the source of seeds, and farmers' location are shared with the customers of our organic market. Besides, they look for the freshness of the produce. Today we had *muttapazham* (egg fruit), which is a rarity. Similarly, *kaarakka*, *ambazhanga* (Indian hog plum) invoke nostalgia among the public, who buy with pleasure. Here we have a self-certification process to admit people willing to sell their organic garden produce. Beyond that, we verify by visiting their farm before authorising them to sell. Consumers also have the privilege to access the farmers via phone on days other than market day to buy from them directly."

It is clear from the accounts of the founders of both the groups that advances in communication technology and social media played a huge role in bringing together scattered rooftop gardeners in the city. As a result, private spaces such as residential parking lots and premises of a local NGO got transformed into weekly marketing spaces for these two groups. The social class of the participants in the groups allude to the growing demand for organic goods in the city. It also alludes to the role of the middle class in mobilizing spaces, technology and capitalizing on the demand for safe, home-grown food in the city.

4.8.3 Sellers' View

For the sellers at the organic market, it is not about earning a living or making profits. Instead, it is making kin outside home- a gathering of like-minded people who share the love for plants and are committed to organic cultivation.

Leela, a gardener who has been gardening for the past eight years and a regular seller at the Swadeshi Karshika Vipani, says, "Like the name (Krishi Kutumbam) suggests, we are a family of gardeners. This morning, I was away attending the funeral of a member who comes to Thycaud Organic Market. She passed away due to a stroke and cardiac arrest. I remember her asking for my jams and squashes, which I sometimes bring to the group." Similarly, Malathy, an eighty-year-old gardener and member of the Krishi Bhumi group says, "More than finding a market, I wish to go here because I am happy; we are like a family. We exchange our produce with each other. If some unfortunate events happen to a member, such as a death in the family, we visit them. All the faces are familiar. We don't discuss caste, religion or politics here. Politics is a strict 'no' here. So, I prefer this place. We discuss recipes. Even today, someone asked me for the recipe for wheat biscuits."

Komalam, a gardener, says, "We sell surplus vegetables at Krishi Bhoomi. Although we are members of the Gandhi Bhavan market too, Krishi Bhoomi at Pillaveedu lane is closer to us. My husband was diagnosed with creatin levels in his blood beyond safe limits and was advised to eat mainly snake gourd, cucumbers, and ash gourds. We went to Krishi Bhoomi to buy them and that is how we became members of the group and began selling our garden vegetables as well. We regularly sell spinach, as many people are unable to grow spinach due to the prevalence of leaf diseases. White spots on spinach are common these days. I spray a mix of turmeric, baking soda and asafoetida on the leaves. Earlier I would apply ash on spinach, however, nowadays people advise not to. They say it starts flowering. I make sure to remove affected leaves as soon as the spots begin to form. Besides, at times we sell ladies' finger and brinjal, drumstick leaves, *cheera chembu* (yam), blue stalked *chembu*. We also sell saplings of vegetables and rare flowers like native jasmine (known variously as *nithya mulla* / *nithya kalyani* / *kurukuthi mulla*.) (It has small petals and a long stalk and is evergreen.), tulsi varieties, *jamanthi* and maize (if inter cropped, it can repel pests.), crotons, and so on.

Jayachandran, a retired Army subedar, a long-term gardener and seller at both these markets, says, "I pluck fresh produce from my garden the evening before the market and weigh them and package them properly. Once I sold eight kilos of *thondan mulaku* (native chillies) to the Krishi Bhumi market. Two days later, the admin along with some other members came to my

home as a surprise visit, following a complaint from the person who bought my chillies. She had a suspicion that I may be growing using chemicals, since organic farming cannot yield as much as eight kilograms at a time. However, when the members searched my rooftop and home premises and saw the methods of my cultivation, it became clear to them that I was a purely organic cultivator. They apologized later. Sometimes people have a mistaken belief that organic cultivation doesn't yield big-sized vegetables or much quantity. However, given the right number of organic inputs and fertilisers, a high yield is possible even through rooftop gardening."

Therefore, the sellers at these organic markets consider the market spaces as spaces of kinship, building an extended family brought on by the shared love of plants. Further, the fact that sellers took their role seriously is evident from the way they described the care they take in growing, picking and packaging. Their accounts also illustrate how popular public perceptions of organic cultivation as yielding less contradicts the experience of organic producers and the consequent trouble that they undergo.

4.8.4 Buyers' View

For the sellers, the organic market is an occasion for gathering and forging bonds with fellow gardeners, getting fair price for their labour, besides sharing seeds and inputs with fellow sellers. However, for the buyers, it is a space to negotiate trust and ascertain the quality of the produce that they buy. Buyers use sensory methods such as visual appeal, seasonality and variety of produce that gardeners bring to adjudge whether the product before them is organic or not. The following case of a regular buyer at Swadeshi Karshika Vipani illustrates this.

Ambujam, a regular buyer at Swadeshi Karshika Vipani, says, "There is a palpable difference in taste, especially in bananas. At the *vipani* (organic market run by Krishi Kutumbam group), we don't find carrots, onions, or potatoes; only locally grown seasonal fruits and vegetables. Among fruits, we get pineapple, and local varieties of bananas—*ethan*, *rasakadali*, *kappa*, and *palayamkodan*. Besides pea, spinach, pumpkin, and ladies' finger, seasonal root vegetables such as a variety of yams are available. Most sellers are home gardeners in the city, except one farmer from the suburb, who collects organic produce from fellow farmers in his locality and sells in the *vipani* (market). There is often a huge demand at his counter, hence there is a token system. We get tender *chembu* (yams) leaves known as *cheera chembu*, as its leaves can be cooked. They taste very soft. Sometimes they sell Kottoorkonam mangoes (native to Kottoorkonam). They tasted very sweet; unlike the ones we get from the big bazaars. The

difference is due to picking at the right time in the case of the former and early picking for sale in the case of the latter. The vegetables and fruits from this organic market taste like the ones I had in my childhood. *Puthina* is another herb I regularly buy from there. I have had a miserable experience with the mint leaves from Chalai (city market) and other conventional markets; they decay in a day or two. On the other hand, the ones from the *vipani* remain fresh for more than a week. I shell out close to 1000 at the *vipani*. I go every alternate week. The price is a bit high; however, considering the quality, seasonality and efforts of family gardeners to grow organically, I don't mind paying the amount quoted. I know a couple that regularly sells at the market—the husband teaches at a school and his wife accompanies him to the market. They sell a special spinach called palak only during its season. Hence, I trust the market and respect the gardeners for their efforts. Besides, they are bringing the food that they themselves eat. They may be adding a few chemicals, but not on the scale that conventional farmers do. Above all, the gardeners seem wealthy enough; they are not in this for the money. Some people buy peas and salad cucumbers in bulk. In general, there is a variety to choose from, but not much to buy as produce is on a very small scale. Sometimes, there are home-processed items like chilli powder, *pappadam* (pappad), raw mango juice, and so on. My doctor has advised eating vegetables. The peas and ladies' fingers are very tender. Native ivy gourds are light green, and soft, unlike the ones we get from Chalai, which are too big in size and taste like *chavar* (grass/waste). The market starts at 1 p.m. every Saturday, and token distribution begins at 12. The token system is a great improvement upon the earlier haphazard rush and chaos that prevailed in the market. One problematic aspect that needs to be corrected is that, given the limited quantities brought for sale, there should be a limit to the amount a customer can take away so that everyone gets to buy from every counter. Many times, I have observed that the most sought-after items such as cowpea are very less, whereas, there are too many of those which no one prefers, say banana stalk. My belief is that small-sized fruits and vegetables are *nadan* (locally grown). I may be wrong, but that is how I judge a thing as organic." Thus, Ambujam looks at the organic market as a means to minimize risks to health from consuming pesticide poisoned vegetables from conventional markets.

4.9 Conclusion

Using the concept of assemblage and becoming put forward by Deleuze & Guattari (1987), this chapter looked at gardening as an assemblage of humans, non-human plants, pests and everyday objects of urban life. It looked at the various becomings that home gardening engenders through various stages in gardening, from sourcing to sharing. Gardeners source seeds and fertilisers through various means. The process of sourcing links the city to the countryside, turn cars into farm trucks and gardeners into pickers and gatherers, and not mere buyers. Composting brings out the indeterminacy and agency of non-humans through over breeding, death, smell, and so on. The process of setting indicate that setting goes beyond placing growbags to concerns for terrace leakage, durability and disposability of the growbags. As a result, old materials such as discarded urban household objects become growbags and get added to the garden assemblage. Planting is the stage akin to implantation, wherein seeds are implanted in the womb of earth becoming babies. Besides, it is also an occasion for spontaneity, and as plants spring up on their own and compete for spaces, often growing wildly much against gardeners' plan to allocate and limit spaces for them. Tending is a process in which urban rooftop gardening in Thiruvananthapuram emerges as an everyday kinship performance or a kin-making process between people (humans) and their plants (non-humans). As evident from the above narratives, this performance takes many forms. One of the ways it gets expressed is through reproach. At other times, it is teaching the younger generation to care for plants by likening plant body as a human body. Furthermore, talking involves talking 'for' plants and protecting them from outside attack, mourning the loss of plant children as the loss of one's own and so on. Watering is also an intimate act, as most preferred watering by hand as it enables close contact with plants. Pest management brings out gardeners' attitudes to pests and also highlight the plant-pest relationship as one of enabling new ecological partnerships for survival. Picking is a source of joy as is sharing with friends, neighbours. However due to factors such as age, morbidity and small family size, elderly gardeners often find themselves with excess home-grown vegetables. Thus, some of the elderly urban gardeners using social media and technology, formed organic market communities. Two such marketing groups have been identified in the study and these groups created market spaces out of residential parking lots and a premise in the city. More than being market spaces, these are spaces of kinship building among gardeners who become extended family to each other. Also, these are spaces facilitating care for fellow urban citizens facing the health precarities from dependency on

pesticide-contaminated vegetables by providing them with good, home-grown organic food. Thus, urban gardening engenders kinship on various levels (between people and plants, between plants and pests and between fellow gardeners) and helps create animistic care world both at home and in the city.

Chapter 5

Becoming Knowledgeable, Expert Gardeners: The Role of Memory, Science, Technology, and Shamanism

According to the three-elemental approach to social practice (Shove, et.al, 2012), besides meaning and materiality, the third element in any social practice is competence which “encompasses skill, know-how and technique” (Shove et al., 2012, p. 14). This chapter, therefore, deals with the knowledge production and exchange with respect to urban rooftop gardening. It is seen that urban gardeners build their competencies through various means, which include formal and informal sources, online and offline modes, and public and private spaces. Unlike traditional land-based agriculture, grow bag gardening requires new competencies, given its curation by agricultural research institutions by prescribing ratios of potting ‘mixtures’ and introducing lab-cultured micro-organisms known as ‘biocontrol agents’. Hence, formal sources of knowledge exchange include face-to-face training organised by agricultural scientists and officers at Krishi Bhavans, institutional training programs by agencies such as Agricultural Technology Management Agency (ATMA) involving model rooftop farmers, and handbooks on pest management distributed by the State relating to organic rooftop gardening. Further, to build competencies for urban gardeners, the state government has set up an agro bazaar, a one-stop shop to buy all raw materials required for rooftop gardening. Informal sources of knowledge include childhood experiences in farming and in some cases, intuitive competencies such as having *kaipunyam* (gifted hands) and curious experimentation. Other informal sources include learning through social media (Whatsapp, Facebook, and YouTube) and training organised by gardening groups involving ecological experts other than agri scientists. I use the anthropological term shaman in a modified sense to describe such ecologists. Through cases and narratives, this chapter explores how urban gardeners, state, and agri institutions, model gardeners and ecologists produce and exchange knowledge and build competencies required to sustain urban organic gardening. It also discusses how formal sources differ from informal sources in scope, relevance, focus, and methods.

5.1 Formal Sources: Agricultural Officers and Scientists

Agricultural officials and scientists are the formal sources of information and training with respect to urban gardening in Thiruvananthapuram. The following narratives illustrate the ways in which these agents enhance the competency of urban gardeners.

Sunil

While interviewing Sunil, an agricultural officer at the Kudappanakunnu Krishi Bhavan, a gardener came asking for pesticides against *velleecha* (white fly). The officer suggested applying 5 ml of a biopesticide known as Safeguard in 1 litre of water, followed by spraying rice water a few days later. He added, “We have not yet found a suitable remedy; studies are going on about *velleecha* as it has become a serious menace”. “*Velleecha* hides beneath the leaves and flies away the moment we touch it,” said the gardener. Sunil nodded, saying, “Well, that is why we ask you to apply rice water, as it makes the surface sticky and traps the pest. The next day you can wash off the dead insect by spraying water forcefully. This method has shown 60% success. Applying any other pesticide is a problem.” “What about *munja* (a sap-sucking pest)?” persisted the man. Before he could finish, Sunil said that the same applied to *munja* since both cause plant viral diseases by sucking the sap. After the man left, the officer continued, “Some people engaged in grow bag gardening often make the mistake of pouring too much water. They do not realise that maintaining the necessary moisture content by sprinkling a few handfuls would do. Instead, they pour cups of water. Too much watering leeches away the nutrients from the grow bag, plugs the air holes, and logs the soil, turning it into a hardened lump in a few months.” Thus, by prescribing a combination of a market-based biopesticide and home remedies such as rice water, Sunil tries to address the gardener’s difficulty in pest management. Further, by stating that gardeners often pour too much water, he alleges the gardeners are often stuck in old ways of growing on land and are yet to modify their practices in line with the demands of small-scale practices such as grow bag cultivation.

Dr. Rekha

Dr Rekha, a retired scientist from the College of Agriculture, Vellayani, says, “I cannot emphasise the role of the Kerala Agricultural University and the scientists enough in the last 15 years in researching and providing training in the following three areas: 1) Supplying seeds and spawns for rooftop and home-based cultivation of nutritive foods such as vegetables and mushrooms; 2) Culturing biocontrol agents (*Trichoderma*, *Beuvaria*); and 3) Promoting

vermicomposting. Attending seminars regarding these is a source of joy for many women. I know at least a hundred mushroom gardeners in the city. Along with the demand for organic vegetables, there is a rising demand for mushrooms. However, we don't have official statistics on mushroom cultivators, and the government doesn't care to distribute spawns freely to people as they do with vegetable seeds for terrace gardening. I am a mushroom breeder. Post-retirement, I began supplying spawns to urban home gardeners interested in growing mushrooms. Unless people know the various nutritive benefits and recipes, they are less likely to take mushrooms. I have conducted a pharmacological study with my students on the impact of applying mushroom extract on cancer-affected liver, cervix, breast, and colon cells. We found a significant reduction in cancer growth. However, people often feel dejected as pests attack the crop. Moreover, laziness in care practices is another factor affecting the success of these initiatives.”

Dr Rekha, thus, highlights the role of research conducted by scientists in agricultural colleges in developing various inputs for urban grow bag gardening. Besides, she points to the vegetable bias in urban gardening despite a growing demand for mushrooms. Based on her experience as a trainer, she identifies areas where competencies of gardeners can be built such as free spawn supply, targeting women, and providing recipes along with inputs in case of mushroom cultivation. Further, by alleging that gardeners are lazy and easily deterred by pest attacks, she advocates attitudinal changes to ensure the success of gardening.

Jessy Chacko

Jessy Chacko, an agricultural officer at Palayam Krishi Bhavan, fondly remembers Jayasree, a home gardener, whom she helped earn a living out of urban home gardening. Jessy recalls, “I met Jayasree through residential association authorities. She is very skilled. We have been able to train her in growing vegetables, mushrooms, and flowers and facilitating their marketing. Moreover, she is a member of the Care and Share group. She faced difficulties in selling quail eggs. However, we helped her sell it through the world market at Anayara by registering her as part of the city cluster. Beyond growing, she is also engaged in value addition and food processing by making pickles and fruit juices. We also helped her process the leaves of the *karuvapatta* (cinnamon) tree in her backyard by providing technical know-how.” Jayasree, the gardener, adds, “I have attended classes at Kudappanakunnu, CTCRI and received participation certificates. At the VAIGA exhibition, I presented novel items such as *sankhupushpam* squash, coffee wine, cashew wine, *changalamparanda* pickle, cashew nut pickle, and so on.” In this

manner, Jessy points to the ways in which, beyond input and pest management, agricultural officers enhanced the processing and marketing competencies for gardeners such as Jayasree.

All the three narratives indicate the ways in which formal sources try to help the gardeners by focusing on providing inputs, biocontrol agents, tips on pest management, training, value addition, and marketing, besides emphasising behavior and attitudinal changes in gardeners.

5.1.1 A Formal Training Class, The Grammar of Science

During my fieldwork, I attended a training class for urban organic gardeners by two resource persons who were agricultural scientists. These classes were held with the support of the Agricultural Technology Management Agency (ATMA). Both the resource persons used a PowerPoint presentation for their demonstration. The following is a transcription of their class.

Resource Person 1

“Vegetables are plant or plant parts rich in vitamins and minerals. Besides, it has been found that vegetables like cabbage and cauliflower contain anti-cancerous and anti-HIV properties. The ICMR (Indian Council of Medical Research) recommends 295 grams of vegetables for an adult's daily consumption, of which 125 gm must be leafy vegetables and the remaining fruit and root vegetables. However, these days, the intake of leafy vegetables is decreasing. Pest and diseases are the problems vexing a farmer. A few months ago, in Kerala, two people died from spraying a chemical pesticide called Virat on paddy. This shows the direct impact of pesticides on human health. The vegetables we consume today come from Tamil Nadu and Karnataka. Cabbage and cauliflower are often dipped in chemical pesticide solution to kill the black worms affecting these. Solanaceous crops like brinjal and tomatoes are vulnerable to bacterial rot. One solution for the same is to grow disease-resistant crops. Another way is to practice crop rotation. A third way is to screen the soil. In Kerala, we have acidic soil. In such a case, we need to add lime and solarise the soil (cover moisture-containing soil using a plastic sheet and expose it to the sun for 45 days). Fusarium is another common fungal disease affecting vegetables. *Shakti*, *Mukthi*, and *Anagha* are some of the varieties of tomatoes developed by the Agricultural College that can withstand bacterial rot. In chillies, *Ujwala*, and *Maniprabha*, in the case of brinjal are resistant. Please inquire about the name of the variant while buying seeds. Vegetable grafting is a solution to many of the diseases affecting plants.”

She went on to explain the history and various methods of grafting. She mentioned that some vegetables and fruits could be grafted, such as capsicum, tomato, chilli, brinjal, watermelon, muskmelon, cucumber, and pumpkin. After her, another resource person took a class about organic farming.

Resource Person 2

The resource person began, “I need not introduce *jaiva krishi* (organic farming) to you. It is how we have been farming for centuries before we began using industrial fertilizers and pesticides excessively. Industrial fertilisers are substitutes for naturally occurring chemicals required for plant growth. These days, getting those natural inputs and maintaining yield are some of the concerns of farmers in organic gardening. If you have any farm animals, it will suffice. Sadly, today most of us do not rear any animals. Instead, we have money to buy inputs such as cow dung from the market. Before beginning organic gardening, farmers need to ensure that their soil and water are enriched. One has to get their soil tested for the presence or absence of essential nutrients. We have various soil types in Kerala, but predominantly *vettukal mannu* (red soil). It is devoid of many nutrients, unlike mountain soil. How do we make the best use of such soil without compromising the yield? *Jaiva valam* (organic fertilisers) is the answer. One way to make it is by converting household waste into compost. Organic gardening is indeed scientific and safe. The principle is to give back as much as we take from the earth. These days ICAR (Indian Council for Agricultural Research) has come up with their organic nano NPK (Sodium, Phosphorus, and Potassium) capsule. It is a certified organic product. Based on field trials, it has been found that 25 kilos are sufficient per hectare. The good news is that these capsules can replace inorganic fertilizers without affecting the yield. In a grow bag, one teaspoon will suffice. Its shelf life is six months, and the effect on residual crops like spinach was positive in field trials. The average shelf life of biofertilisers is six months. Cow urine is very effective for spinach. In sandy soils, spinach gets affected by white spot disease. Cow urine is a constituent of *panchagavyam*, which, although used as a ritual food, is very nutrient-rich.

Solid organic fertilisers are of four kinds 1. vermicompost, 2. coir pith compost, 3. neem cake, and 4. groundnut cake.

Worms are not a nuisance; they are valuable agents of decomposition. Vermicompost is another organic fertiliser. People have a stigma towards doing vermicomposting. Cow dung is an excellent worm multiplier. Coir pith composting is not easy to do at home. Using oyster mushrooms, we can compost coir pith. The conventional means of composting coir pith is by

adding urea too. Instead, we can add cow dung or poultry waste. This way, we can eliminate the use of urea. Integrated use of organic fertilisers is more effective than depending on only one source of organic input, such as cow dung. The importance of neem cake lies in its insecticidal property, in addition to its nitrogen content. However, the neem cake we get in the market these days contains only 1 % nitrogen instead of the recommended 4–5 %. The quality of organic inputs also depends on the companies that process them. *Kummayam* (lime) is used to reduce acidity; however, excessive use of the same takes away the nitrogen content. In a sheltered area, spread a coir pith. On top of it, add 200 gm of cow dung/poultry, and mix well in water. After 20 days, mix oyster mushrooms. Check that there is sufficient moisture. Keep repeating with layers of the same. Coir pith has more potash. Adding leaves of *sheema konna* (*Gliricidia sepium*) provides nitrogen to it. In essence, we have formulated a method based on tradition in such a way that it helps us prepare organic fertilizers quickly in our homes. Use locally sourced manure, whether it be cow dung or poultry. The poultry manure from other states like Tamil Nadu may contain chemicals.”

After explaining solid fertilisers, she listed out the following liquid fertilisers:

1. Fish amino acid (fish, jaggery)
2. E.M (effective microorganisms) stock solution (fruit-based, activated by jaggery)
3. Mineral compost: We know that soil is formed from rocks that contain minerals and micronutrients. M sand that remains from quarrying is also effective.
4. Phosphorus enrichment by using rock phosphate

She continued, “Inoculum is added to speed up the decomposition of kitchen, food and farm waste. Next time, the compost thus formed can be used for further composting. Nowadays, people prefer less cow dung and more neem cakes. The cow dung we get these days is also not good. It smells because cows no longer graze; they are fed with fodder and cattle feed. Perhaps every household must be given a cow. *Sheema konna* leaves (contain 2.5 % nitrogen) are easier to compost, as their leaves are tender, unlike mango or jack leaves.

The importance of legumes. We can make use of the space around banana plantations to grow peas. The crop residue can be fed back into the soil. This fixes nitrogen into the soil.

Rotating crops is essential in organic gardening; say, after growing a tomato, do not grow chilli, as they are both from the same family. Microorganisms help in making the soil alive. *Rhizobium*, *acetobacter*, and *spirulina* in the root nodules of leguminous plants help fix nitrogen. The reason is that these organisms act as mediators, which convert nutrients in the soil into a form usable by the plants. NPK *jeevanu valam* (biofertiliser) helps make available N, P, and K.

Azolla is an effective alga in terrace gardening that decomposes quickly and enriches the soil with nitrogen. The best time for applying *jeevanu* (bio-fertilizer) is while sowing, transplanting, and composting. Bodo mixture is notable for its anti-fungal properties; the use is restricted, for more than 8 kgs of copper in a hectare is harmful.”

She ended the class by emphasising that Solarization is essential to organic cultivation. It involves covering the soil in a transparent polythene sheet and exposing it to the sun’s heat. It helps remove harmful microbes from the soil.

Thus, the vocabulary of formal training class can be called the grammar of science. This is evident in the way the resource persons define vegetables in terms of their nutritive, health and dietary utility for humans based on recommendations by national medical institutions. They also promote products of agricultural research such as pest-resistant plant varieties and grafting methods. Further, they define organic farming as a scientific practice, and their prescriptions for organic methods of cultivation focus on suggesting organic material substitutes that fulfil scientifically prescribed nutritive needs for every plant in terms of NPK. Besides, the concern of maintaining yield while transitioning to organic farming is reflected in their accounts of field trials. In this manner, a utilitarian and scientific approach underlines formal training classes.

5.1.2 Agri Meets

Agricultural meetings like VAIGA are a point of contact for the state and the urban gardeners. One such meet was organised at the time of the study, in December 2019. It was known as PRE VAIGA. VAIGA stands for Value Addition for Income Generation in Agriculture. At these meetings organised by the state government, ministers and agricultural experts delivered lectures on organic farming, the emerging technology of food processing, the need for self-sufficiency in vegetable cultivation, and the importance of going local. These meets were also occasions to honour institutions such as government schools and individual rooftop gardeners in the city. These meets provide recognition to farmers, popularise organic farming, and are also an opportunity for home gardeners to present home processed food like vegetable and fruit juices and technologies for food preservation.

5.1.3 Krishi Bhavans, Karma Sena and Eco Shops

Krishi bhavans are an important centre of knowledge production and exchange with respect to urban rooftop gardening. Radhika Devi, a long-term rooftop gardener recalls her experience in attending a class at the local Krishi bhavan close to her home as follows.

Radhika Devi

Radhika Devi is a 56-year-old gardener, who took to gardening after becoming aware of pesticide residue in vegetables brought to Kerala. She has been growing vegetables on her rooftop for ten years now. She recalls, “An important lesson gained from training classes at the Krishi Bhavan was the use of *Pseudomonas*. Soaking seeds in this solution for a few hours before sowing or applying this around the sapling prevent fungal attacks. Besides, they also taught us that mechanical management of pests could be done by picking them and, if necessary, burning them safely away from the garden. I learnt that soil has many microbes like *sankhu*, *chippy*, etc. During the training, they suggested that snails come out in the evening—one could catch them then.”

Radhika Devi’s account highlights the gardener’s knowledge gap in terms of using biotechnological solutions such as *Pseudomonas* which is filled by the training classes at Krishi Bhavans.

Besides the official training organized at Krishi bhavans, karma sena and agro service centres play a vital role in making potting mixtures, distributing grow bags and installing drip irrigation tubes for urban gardeners. In an interview with the women karma sena workers at Kudappanakunnu, they explained how they prepared the potting mixture and met the needs of urban gardening.

Ponnamma, a Karma Sena Technician

Kudappanakunnu was the first Krishi Bhavan that set up a karma sena. “We are all technicians,” says Ponnamma. She continues, “In the beginning, there were over a hundred of us. Gradually many left as wages have not been revised. Currently, there are 32 technicians, of which 13 are women. I have been here since the first batch got recruited. We work from 10 a.m. to 5 p.m. every day. Our supervisor gets us seeds, pot trays, and covers. Women technicians make the potting mixture and raise seedlings, whereas the men do more demanding jobs such as spraying pesticides on palms, weeding, and transplanting paddy with machines on farmers’ plots, besides

driving vehicles with grow bags to city gardeners' homes, setting up the bags and irrigation equipment on their rooftops. Older women technicians like me are involved in preparing seedlings and filling grow bags. We were taught a formula according to which we prepare the potting mixture. Fifteen buckets of sand, thirty kilograms of coir pith compost, twenty-five kilograms of poultry waste, ten buckets of cow dung, five hundred grams of dolomite, and ten kilograms of vermicompost go into the making of the potting mixture. These days, sand is difficult to procure. Hence, we have increased the ratio of coir pith compost. We mix *Pseudomonas* with coir pith compost as it somewhat prevents blight and other diseases. We run the sand through a sieve to remove stones, then mix it with dolomite for two days. Afterwards, we add other ingredients like coir pith compost, vermicompost, cow dung and poultry waste. We get coir pith compost from the agro service centres in rural areas. Kudappanakunnu has animal farms, which makes it easy to procure cow dung and poultry waste.”

She adds, “There is an eco-shop²⁷ at the entrance to our Krishi bhavan. We sell fertilisers, biopesticides and seasonal fruits and vegetables sourced from the organic gardeners in the neighbourhood here. We also sell seedlings of various stages separately. Some seedlings are ready to transplant in a few days. These are sold for three rupees. Others are raised to a level where they can withstand for ten days before being transplanted by the gardener. There is no point blaming the technicians for failure in gardening. Sometimes the weather is not favourable. At other times, gardeners fail to replenish the fertilisers in the soil. The fertilisers we supply last for only 15 days (sufficient for root growth and a few leaves), after which the gardener has to keep adding fertilisers themselves. Gardeners are of different kinds. Some listen to our advice; others despise us. For instance, I once advised a gardener regarding the proper method of tending to plants that are not native, such as cabbage and cauliflower. During our recruitment training, I understood that these plants must be covered with soil up to the leaves; else, the stem grows taller, and the plant won't bear fruits. At first, the gardener refused to believe me. Later on, after experimenting, he got better yields and thanked me. People approach us after plants have been infested. Prevention is better than cure in organic gardening. Every week we must apply neem emulsion as a preventive measure.” Therefore, Ponnamma's account shows that the karma sena workers are scientifically trained in the process of preparing potting mixture, plant growth and biopesticide application. Her experience also shows the way the gardeners respond to the advice of technicians like her. In addition, it shows the gendered division of

²⁷An eco shop is a marketing facility set up by the government which sells inputs and fertilisers and biopesticides, besides here city gardeners can bring their organic produce for sale

labour among karma sena workers, with the women filling potting mixture and preparing seedlings, and the men transporting them to gardener's homes for installation.

In addition to input preparation and interactions at the Krishi bhavans, knowledge exchange happens at the rooftop, as the male Karma sena workers set up the grow bags and interact with the gardeners.

Mohan, a Karma Sena Technician

The following is a conversation between a karma sena technician, Mohan and a gardener during the installation of grow bags with drip irrigation at the latter's rooftop.

Gardener: Will you come again for a follow-up? Do I need to apply fertilisers?

Technician: No, there is no follow-up. There is sufficient fertilizer for a one-time harvest.

Gardener: So, watering alone would suffice?

Technician: For one week, you need to water intermittently. Add organic fertilisers from Afttech company (2 kg costs 70 rupees) or vermicompost every 15 days. Pea saplings are among this lot; you can fix two stumps to help them climb.

Gardener: Seri (okay)

After arranging the growbags, the technician looks for pipes to connect to drip tubes. Meanwhile, she talks about her practice.

Gardener: I have been growing since 2004, when the government started supplying grow bags. I first tried growing in the backyard, but it failed. Then I tiled the terrace and moved the bags to the terrace. Nowadays, I find it difficult to water myself, hence I applied for drip irrigation alongside.

I want to try wick irrigation, but how to do so without pipes?

Technician: Try using a 2-litre Pepsi bottle punctured in the middle and placing it in the grow bag.

Gardener: There are too many pests in my bitter melon. The plant had borne many flowers but overnight, all were gone. Out of frustration, I washed all the leaves that had curled and were full of yellow pests.

Technician: Look! That's where they come from (points to the coconut palm leaves stooping over the rooftop, infested with vellecha (white fly)). Use organic pesticides such as Nimbecidine (neem, garlic, soap emulsion) and bio-neem from agro bazaar. Dilute 2 ml per litre of water and spray on the affected part. The following day spray verticillium.

The above conversation reveals that karma sena workers suggest intervals of fertilizer application, name and source of fertilisers, simple do-it-yourself means of irrigation (using bottles), and some ways of pest management. Their scientific training is evident from the names and quantities of biofertilisers and pesticides that they suggest to the gardeners. The gardener's enquiries reveal that pest management is a serious problem vexing urban rooftop gardeners.

5.1.4 Agro Bazaar

In 2010, an agro super bazar was built in the city centre, on the premises of the Kerala Agro Industries Corporation Limited, set up by the state government. The aim was to make available most of the materials required for urban farming in a single place. Mahesh, a staff at the bazaar explained, "The same year, we collaborated with the State Horticulture Mission (SHM) to supply 25 grow bags with potting mixture and saplings to households and install it on their rooftops. Initially it was a free scheme; later, a beneficiary contribution of 500 was sought to weed out disinterested people. Since grow bag wears out quickly, people are slowly shifting to containers. Agro Industries, Kudappnankunnu Krishi Bhavan, RAIDCO, and Tab Agri Systems were the agencies involved in this grow bag distribution scheme. Except for spinach, where we supplied the seeds, we supplied saplings." Mahesh showed me a handbook of pest management in vegetable gardening, along with grow bags and a form that had to be filled in by the beneficiary. He remembered supplying grow bags to at least 5000 households. He said, "We were not involved in the follow-up of the scheme. However, an advantage was that post this scheme, business in the agro bazaar improved. Everything required for gardening, including pheromone traps, is available here. Besides, farmers are familiar with agro industries, which were set up to provide farm equipment at subsidised rates. Agro bazaar's working hours are from 9 a.m. to 8 p.m."

A tour of the bazaar

First, we moved across the seeds section. He said that seeds were sourced from government farms and hybrid seed companies. Besides seeds of local vegetables, carrot and coriander seeds were also available in limited quantities. There was a section for *karshika upakaranam* (farm equipment such as hand gloves, water sprayer, weeding tools and so on). Then there were organic fertilisers, pest traps such as Pheromone traps to trap insects, rat traps, pesticides against *komban chelli* (pest attacking coconut palm), water sprayers, and drip irrigation equipment. He explained the parts of a drip, such as valves, and types of drips, such as arrow

drip, four-way drip, connector, and so on. He said drip is preferred over wick as the latter is the latest technology and is costlier. A drip valve costs only 5 rupees; the pipes cost 6 rupees per metre. He says, “Drip technology is very simple and easy to use. We must clean the tubes occasionally. Nowadays, plastic pots are replacing grow bags. Grow bags can break while shifting, whereas plastic pots are safer. Above all, aesthetically speaking, plastic pots look better. An emerging trend is indoor gardening, for which we have a special section on the first floor of the bazaar. In orchids, flower yields are higher; hence people love them. Shade nets that block sunshine up to 35%, 50%, 75 % and 90% are available. “Out of ignorance, most vegetable growers buy shade nets, that too ones that block 50 – 75 % of sunlight. Even when we try to explain that vegetables need sunlight, they care more about their own protection while tending to their garden, the aesthetic value of green colour to their homes, and the taboo against using black nets. Orchids, anthurium, and mushrooms are the plants that need shade nets, not vegetables,” says a saleswoman. “There are pot trays to grow seedlings. These days we have pots made of fibre. Though costly, they last longer than plastic. People demand beautiful pots. Indoor gardening is preferred by elite groups, and indoor plants are becoming gift items. Commoners are involved in outdoor vegetable gardens. There are biowaste compost bins, organic food products from Wayanad, foods prepared by self-help groups, jackfruit seed powder, farm products sourced from Punalur, Kashmir-based agro corporation, products from the women’s jail, research products from the Palodu Botanical Garden derived from tea waste, enriched hair oil from the ritual coconuts used in Sabarimalala. We have veggie wash prepared by the Agricultural College to clean pesticide residue in vegetables. Although there is a demand for these products and the bio-pesticides like *Nanma* and *Menma* prepared by CTCRI (Central Tuber Crops Research Institute), big chemical pesticide companies are lobbying against these products. We sell mango juices containing 15 % fruit pulp, unlike the conventional juices in the market, which contain only 5 % fruit pulp. We have a biogas, aquarium, and greenhouse on our premises.” Soon, Sreejith, a founding staff at Agro bazaar, joins us in conversation. He recalls, “The bazaar was inaugurated on June 23rd. 2010. We had a greenhouse in the beginning and six staff; later, we scaled it up. We support organic farming by providing cow dung, neem cake, groundnut cake, vermicompost, and so on. People are taking well to this enterprise with the rising awareness about chemical farming and pesticide residue in vegetables. We sell a grow bag for 15 rupees. A ready-to-plant grow bag is sold at 60 rupees. 40*24*24 is the dimension of an average grow bag. In the beginning, we were the sole supplier, now, private agencies and Krishi bhavans are also supplying grow bags with saplings. We are no longer involved in the grow bag distribution scheme; the Krishi Bhavans have taken that up. Our

customer base involves older retired hands. Kudumbasree, agriculture university, Krishi Bhavans, and private nurseries are the sources of the products sold here. We have formed an agro club, where members of the city can bring seedlings that they raised and we sell them at 10% profit. There are many people supplying orchids to us regularly. Cow dung is sourced from Milco company and other home-based farmers. Dried cow dung is the most sought-after fertilizer. Neem cakes are sourced from Tamil Nadu, and Karnataka, while cow dung and vermicompost is mainly sourced from within the State.”

We can conclude that agro bazaar is an institutional mechanism in the form of a shopping complex that enhances urban gardeners’ capacity by making every input available under one roof. However, it can also be noted that while many gardeners preferred manual watering over-irrigation technologies such as drip and wick irrigation, besides citing problems associated with them such as frequent repair, and also loved getting their hands dirty (see chapter 4), the staff at agro bazaar promoted these equipments, unmindful of the experience and outlook of home gardeners to these technologies.

5.2 The Role of a Model Gardener: Case – Rajendran

Rajendran is popular among the scientific community as well as the gardeners in the city. He has won the name ‘model rooftop gardener’ for his innovative techniques of gardening and passion to share his knowledge with others. I met Rajendran in the month of August. “It is an auspicious day,” he said, “Today is the first day of Chingom (the first month of the Malayalam calendar), which is celebrated as farmers’ day.” Hailing from a farming family, Rajendran had fond childhood memories of paddy cultivation. Further, he had the inquisitiveness to learn the techniques of farming. He recalled, “In the olden days, rice seeds called IR8, IR5, No2, and No.22 were used. At that time, rainfed agriculture was common. Before sowing the paddy seeds, the field was prepared, and it was usually done by *kalappa* (plough) drawn by buffaloes. The track of the seed sowing area was made with the help of a *kalappa* so that each track formed circles. While ploughing, simultaneously, seeds were sown by another person. While sowing was completed in one track, the ploughing in the adjacent track would supply the required quantity of soil to cover the seeds of the previous track. Nowadays, tractors have replaced animal ploughing. Currently, most of the agricultural lands have become residential land areas. As such, the children of nowadays cannot even recognize a paddy field or identify paddy plants.” In this regard, once, when he was called to handle agricultural classes at one

school in Trivandrum, one student asked what the plant in which rice is cultivated is called. He was astonished to hear this question as the participant did not know the name of the paddy. He said, “The student cannot be blamed as she had that much knowledge only about paddy. Rice is available in the market, and the student did not experience the history of rice before its availability in the market till that date.” He explained in detail, and the student was invited to his home, where he showed the process of cultivation of paddy and elucidated how it is processed further to become rice for making food.

5.2.1 Rajendran’s Experiment with Paddy on the Rooftop

In the words of Rajendran, “I proved that in addition to vegetables, paddy could also be cultivated on the rooftop (see *Figure 5.1*). Small plant containers made of mud and clay can be used to prevent them from falling when they become ripe. Due to wind, they may fall if the cultivated quantity exceeds the container's optimum level. If the containers are kept in a line and cultivation is done, there is no such problem. If we directly use the terrace for paddy cultivation, in the long run, there are chances for damage to the terrace. Leakage may happen and ultimately weaken the building. After several experiments, I discovered that if we erect a stand made of pipe at a moderate level of 16 inches from the terrace and the container for the paddy plant is placed on it, the terrace will be safe and the yield better. Usually, grow bags come with holes at the centre, which causes continuous wetting on the terrace. I suggested that the holes be put on the sides so that waste water is collected in a plastic tray at the end of the stand and disposed of. The companies who manufacture the grow bags also started to implement this suggestion. This method was accepted by the agricultural department too.”

Figure 5.1: Paddy on Rajendran's Rooftop



Source: Fieldwork

5.2.2 Hridayamrutham: Nectar of Life Made from the Heart

Rajendran is also famous for making his own organic manure-pesticide solution which he calls *hridayamrutham*. The word is made of two words *hridayam* (heart) and *amrutham* (life-giving nectar). It means ‘the nectar of life prepared from the heart, out of love’. To make *hridayamrutham*, he gathers almost 150 herbs belonging to four kinds: 1) those tasting bitter like leaves of neem and poison fruit tree, 2) fragrant ones like tulsi, *thumba*, 3) those with obnoxious odours like chan leaves, siam weed (popularly called communist *pacha* in Malayalam, and 4) milky sap-secreting ones such as the leaves of papaya, ivy gourd, tapioca and so on. After collecting these herbs, he chops them finely, deposits them in a barrel (with a capacity of 100 litres), and pours in a mixture of jaggery and cow urine so that the leaves are thoroughly soaked. Following this, he adds groundnut cake. Occasionally, he stirs the mixture in a clockwise direction (see **Figure 5.2**). In three months, the leaves degrade fully. He dilutes one part of the concentrate in thirty parts of water and adds to the plants from the time they attain a four-leaf stage.

Figure 5.2: Rajendran Stirring Hridayamrutham



Source: Fieldwork

Due to these efforts, agencies such as ATMA, in 2015, recognised him as a model farmer and sponsored Rajendran to hold training and workshop (*Figure 5.3*) on organic farming for urban gardeners. Presently, beyond the one-time sponsorship, Rajendran continues to hold classes on the ATMA model. These days classes are run on the voluntary contributions of gardeners who come to attend them. Rajendran's 4-day workshop includes classes on setting the soil and filling the grow bag (see *Figure 5.4*) and introducing the basics of rooftop gardening on day one, making home-based organic manures such as vermicomposting, fish amino and biopesticides on day two and day three, and a field visit to a farmer's garden on the last day.

Figure 5.3: Rajendran's Workshop



Source: Fieldwork

Figure 5.4: Rajendran Demonstrating Grow Bag Filling



Source: Fieldwork

Gardeners trained under Rajendran share their experiences and learnings as follows.

Prasannan

“I have childhood memories of seeing my grandparents grow vegetables; however, my journey as an organic farmer began in 2013. I tried to grow the way I knew, but I wanted to learn more due to growing pest attacks and decreasing yields. When I met Rajendran, an award-winning

organic farmer, at an exhibition at Kanakakunnu Museum Garden in 2014, he invited me to join the ATMA School for urban gardening. As part of the training, I learnt how to prepare the soil, fill the grow bag, plant the seed, and use the best organic fertilizers. Besides ATMA, I attended training for integrated farming in 2018, classes at the Ulloor Krishi Bhavan, and the Central Tuber Crops Research Institute (CTCRI). I have set up stalls at CTCRI, and Attukal. I have exhibited 46.8 kgs of jack fruit, 118 kg of African yam, passion fruit, and 60 cm long *chatura payar* (winged bean), which grew in my garden, on the terrace and in the backyard. At ATMA, once, someone distributed the seeds of a winged bean—only mine sprouted. I had cultivated soya beans. The yam was 4 feet deep. In 2016, I received the Best Farmer award at ATMA school. I organised a seminar with the support of the Farm Journalist Forum (FJF) at the Vellayani Agricultural College on eco-friendly and sustainable farming. I am an executive member of FJF, and a co-organizer of ATMA, besides being the unit executive of the Pensioners' Association. I am a member of the school development board of the government L.P school, Pongumoodu. I have received training at the soil museum, Parottukonam, where I learnt how to preserve and manage soil. Due to my sincere efforts in agriculture, I got many recognitions and awards. We get good seeds from the ATMA gathering. Seed quality and soil health are crucial. Else, people will become demotivated.

Leela Mathai

On asking Leela Mathai, a 60-year-old gardener how she filled her grow bag, she said, “As Rajendran Sir taught us in the training class, I would first place coconut husks in the grow bag. I would also add some dried leaves. Then I would add the soil mixed with lime and set it aside for 15 days. Later I add soaked neem cake, cow dung (dried and wet), cocopeat, and bone meal. When I moved into vegetable gardening, I replaced my flower pots with grow bags. Initially, the galvanized iron (GI) stands made to place grow bags and flower pots were too high with four levels. However, when Rajendran Sir visited my home, he said 14 inches is the ideal height. Placing the grow bags at greater heights would make it difficult to tend to them and won't support growth. Upon his suggestion, I converted the four-layered stand into a two-layered one.”

Padma Suresh

“While I was engaging in orchid gardening, I met Ulloor Rajendran. I saw his terrace and liked what he was doing. I got a few vegetable seeds from him. Later he came to my home and suggested vegetable gardening. Following his advice, I began growing vegetables. Beginners

must grow vegetables that are likely to yield results; else, they will lose motivation. That is the same with any field. I began with vegetables which are required every day. I began with curry leaves, tomatoes, and chilli. Rajendran Sir suggested that we must nip the buds and flowers of curry leaves to allow side branches; else, they will grow upwards like a tree. I have always been fond of greenery. Initially, I got seeds from Rajendran Sir. I began vermicomposting. I used the earthworms given by Rajendran Sir. However, these earthworms require optimum temperature and moisture conditions. If it rains heavily, earthworms can't survive. They go out. That is why we use jute sacks to cover them. The slurry from vermicomposting, known as vermiwash, is also a good growth enhancer.”

The above testimonies of gardeners trained under Rajendran reveal comprehensive knowledge, personalized support and assistance that they received which is absent in the general training given by agricultural officers and Krishi Bhavans. While the latter focus mostly on suggesting improved varieties of seeds, and list of organic fertilisers, Rajendran’s classes begin with the foundational step, i.e., filling a growbag. In the case of Prasannan, contacting Rajendran helped him gain knowledge of soil health, seed quality, and ways to make better fertilisers, besides opportunities to connect with other institutions and forums in the city that earned him acclaim. Leela’s and Padma’s experience indicates the benefit they received due to Rajendran’s visit to their rooftop garden and his suggestions regarding the right height to place grow bags at, tips for better yield, and good seeds. Training and contact with Rajendran ensured these gardeners a trustworthy source of seeds, worms for vermicomposting, and fertilisers as these were saved and prepared by Rajendran himself.

5.3 Informal Sources

In addition to the formal sources, there are informal sources through which gardeners become competent in urban rooftop gardening. These include in some cases depending less on formal training sources and inputs and in other filling the gap left by formal sources through various means. Following section details narratives and experience of untrained gardeners who have not had any training on organic farming or latest technology regarding the same.

5.3.1 Untrained Gardeners

Purushotthaman Nair

“We used our ingenuity and reused the materials available in and around our home to set up our garden. We used the bricks left over from the demolition of a building that stood earlier in this place. We spread soil, equivalent to one truckload, on the terrace. There has been no leakage or damage to our roof for the past twenty years. Once, we had grown yams that spread like an elephant foot. When I received the award, they gave us biopesticides, but I never used them. Mainly, we deal with pests mechanically, picking them every day from leaves and killing them. We have a composting facility. Whenever we visited our native place, we would bring back cow dung. Even if cow dung is not available, we can use fish and kitchen waste as fertilisers. In training classes, they prescribe the application of fertilisers in scientific measures such as 5 ml in one litre and so on. We don’t follow that. We follow our common sense.”

Krishnankutty Kartha

“We have not attended any training programmes or enrolled in government schemes. Initially, we used thermocol boxes. However, birds began boring holes into them. We didn't use grow bags as they get damaged after a year and generate plastic waste. Instead, we moved to drums. We try growing anything we get. We have grown tomatoes, ladies’ fingers, cucumbers, pumpkins, chilli, and dragon fruit. Instead of throwing the wastewater generated while cleaning the fish tank, we use them to water the plants. Gardening is not something we have to shell much money on.”

While the trained gardeners are dependent to some extent on the market and model gardeners for inputs such as seeds, organic fertilisers and biopesticides, besides shelling money on terrace care in the form of special equipment such as gI pipes, the untrained gardeners are not market dependent. They seem to be more open and creative, using what Purushotthaman Nair referred to, ‘common sense’ and outrightly rejecting formula-based gardening.

5.3.2 Childhood Memory

“Materials and space are two ingredients in the making of memory within a social setting” (Halbwach, 1992, cited in Alt & Pauketat, 2019). In his book *Perceptions of the Environment*, the social anthropologist Tim Ingold introduces the concept of “enskilment, in which learning

is inseparable from doing, and in which both are embedded in the context of a practical engagement in the world – that is, in dwelling” (Ingold, 2002, p.416). He illustrates it using an example from his own life as follows:

When I was a child my father, who is a botanist, used to take me for walks in the countryside, pointing out on the way all the plants and fungi – especially the fungi – that grew here and there. Sometimes he would get me to smell them, or to try out their distinctive tastes. His manner of teaching was to show me things, literally to point them out. If I would but notice the things to which he directed my attention, and recognise the sights, smells and tastes that he wanted me to experience because they were so dear to him, then I would discover for myself much of what he already knew (Ingold, 2002, p. 20).

Likewise, most of the elderly gardeners recalled childhood memories of growing up on a farm, and they are the first generation that moved away from farming to other vocations. One gardener, Sudhakaran, went as far as to say “Gardening is in our blood. We were agriculturists. I never ate white rice until I went to Bombay for my studies. I remember seeing my grandfather working on the fields, us growing ladies' fingers, spinach and brinjal.” Komalam, an elderly rooftop gardener, says, “In my childhood, I would assist my father in gardening. He would grow tapiocas and yams. I would collect *kareela* (dried leaf litter) to cover the yam pits. Since I grew up watching him and working with him, I have learnt many techniques. We also had local pea varieties like *chatura payar*, and drumstick trees around my native home. I brought one of the drumsticks from there and planted it here in this home. I add drumstick leaves and peas to the wheat porridge I make.” Purushothaman Nair, who migrated to the city from a rural part of Thiruvananthapuram, said, “We are from a farming background. We have paddy lands in my native place. We were gardening on our rooftop, even as we were working. I worked in a bank, and my wife worked in the secretariat nearby.” Shyamala, another migrant to Thiruvananthapuram, said, “My father was a farmer. I remember going to the field, carrying food for him. I would help him. Even as a child, I loved the smell of rain, cow dung, and clay. When it rained, I would stand outside, taking in the earthy smell, and my mother would say that I am made of *pitta* (fire-dominated body type). In our village, there was a practice of carrying wet cow dung in palm leaves to the fields in the month of *Vrischikam* (November 15–

December 15) and throwing them there. During school days, I would bring home plants from wherever I went and plant them.”

Dayanandan, a retired college principal and rooftop gardener, says, “Until my father's lifetime, our livelihood depended on paddy and coconut farming. While planting tapioca, my father would also sow a few vegetables, such as ladies’ fingers around its pit. They don't look gaudy or huge in size, but they are grown organically and therefore, safe to eat. Yams and arrow roots were abundant on our farm. At any point in the year, we had some food. Being the youngest of seven children, I spent a lot of time with my father and learnt many best gardening practices while assisting him. He was an expert at rice farming using the backwaters of the Vellayani Lake. The waters from the lake were used to irrigate the rice fields. While people fought to supply water to their fields during the daytime, my father would wake me up in the middle of the night and take me to the fields to release water into our field. After a few hours, we would go again to close the bunds. In that way, we would raise two crops in a year. I remember cribbing and hating those midnight walks, but now I recall those memories fondly.”

“My father was involved in planting, for example, tapioca,” recalled Radhika Devi. Pointing to the areas opposite the road in front of us, she said that those were all agricultural fields turned into residential areas. She recounted, “This place was *anjumukku vayal* (a junction of 5 paddy fields). People would grow vegetables after the paddy harvest, mainly spinach and cucumbers. They never used industrially produced chemicals. We hardly bought vegetables from the market. My twin sister and brother are more active gardeners than I am. She has *kaipunyam* (graceful hands).” Jayashree, a home gardener, pointed to a tiny herb in her grow bag and said, “*Thumba* juice is good for uterus-related diseases. In my childhood, whenever I caught a fever (very rarely), my grandmother would prepare a concoction made of *thumba*, *adalodakam*, pepper, dried ginger, tulsi and coffee. I am allergic to antibiotics. Now I have a few herbs and spices. I have a tiny lotus pond. Lotus petal tea is good for cardiac diseases. Anything I sow bears fruit. People say, I have *kaipunyam* (gifted hands). Perhaps because of some good deeds in the previous birth.”

Krishnan Nair, the secretary of a Residents association in the city recalled, “I was in the forefront of motivating people to take up this venture. We educated them about the benefits, physical, mental and economic, of this process. We found that very few people were interested, mostly older people after retirement, above 55–60 years. Younger people are not aware, hardly 5–10%. They sulk at the thought of touching cow dung. However, the older people are familiar

with rural living, and have childhood memories of cultivating and the importance of eating healthy food.” Sumathi, a cooperative bank employee, says, “There are varieties in *vazhuthana* and *kathiri*. There is a dying variety called *nithya vazhuthana*. It is a creeper variety, abundant in my childhood days. Above all, both I and my husband have childhood experience watching our parents cultivate the farm lands. We have grown up watching how agriculture is done.” Her colleague, who is also a gardener, says, “In my childhood, we used to buy only red chillies and coriander. We used to have pineapple fencing. Besides, I had childhood memories of tasting mangoes (*taali maanga*, *vaalam poli maanga*, *vellari manga*, *kilichundan*, etc.) cashews, *karakya maram* (olix tree), custard apple, *kaatu nelli* (wild gooseberry), champangya (water apple), pulinji (bilimbi), lemon, and melons (*kambili narangya*). I have some of these in my rooftop garden, which I sourced after much hunting.” Radha Sharma, a working woman and gardener, says, “Gardening was always there in the back of my mind. My family, my siblings especially, are very enthusiastic. It is because of the childhood experience we shared in helping our dad in gardening. While in Jalandhar, he used to grow carrots, peas, onion, and potatoes in our backyard. For peas, we used to put up scarecrows. We used to lay traps for rodents eating away carrots. Watering the plants daily was my job. We had grape wine. They used to call it *malta*, a small orange like citrus fruit. In Delhi, we couldn't grow much, as we were living in a flat. Later when we moved to a ground floor apartment, I used to plant *palak* (green spinach) and ladies' fingers in pots.”

It is evident from the above narratives that, urban gardeners cherish childhood memories of tasting varieties of fruits and vegetables, which reflects in the variety of crops they grow in their rooftop garden beyond just ‘vegetables’ to yams, tapioca, herbs and fruits. Besides, being apprentices to their parents on their farms reflects familiarity with materials like cow dung. However, these memories are mostly related to land-based farming of paddy and other local seasonal vegetables and therefore do not help in rooftop gardening which requires learning new ways of filling the soil, setting the grow bags and addressing issues of varied kinds of pests.

5.3.3 Community Sponsored Classes and Training Programmes

Community sponsored training programmes are an important informal source by which gardeners fill the knowledge and material gap left by formal sources. As mentioned in the previous chapter, there are two prominent gardening groups, Krishi Bhumi and Krishi Kutumbam in the city of Thiruvananthapuram. They hold meets and training classes by inviting

experts other than agricultural scientists. They also share rare and indigenous seed varieties amongst each other. I attended one such meeting organized by the Krishi Kutumbam group at Gandhi Bhavan in September 2019, a week before Onam. K V. Damodaran, known as the forest man of Kerala, was invited as the key speaker (see **Figure 5.5**). He is the author of the book *urvarathayude sangeetham* (The voice of fertility).

Figure 5.5: Keynote Speaker being Invited by Administrator of Krishi Kutumbam



The theme of the talk for the day was ‘*paristhithi and jaiva krishi*’ (environment and organic farming).

The following is the excerpt of the class by the ‘forest man’ in the forenoon session.

Damodaran

The forest man, Damodaran, began by stating that for the past 33 years, he has been involved in organic farming. He recalled that in 2009 Kerala *Jaiva Karshaka Samiti* (Kerala Organic Farmers’ Association) had entrusted him with the task of learning about farming. The problem before him was that organic farming being high-risk field people were leaving it. He had identified three reasons for the same and began to elaborate each one as follows. He began, “40 bananas (*Ethan*) were our first experiment. Everyone appreciated it, but few got inspired to take it up. I then realized that it is not enough to demonstrate organic farming. Farming needs to be profitable, health enhancing, enjoyable, and farmers need to be respected and recognized. I met one of the founding members of Infosys, which awards farmers every year. The Agricultural University evaluated the impact of this award distribution programme in the eighth

year since its institution. The study proved that people were happier when they were recognized for their efforts by the community. 400 farmers from across the state meet every year for the award ceremony at Muhamma, Alleppey and returned with joy.” Damodaran further spoke about the problem of lack of accessibility to knowledge which farmers face. He accused that although we have set up agriculture universities, every year thousands of students pass out by writing exams, but with little practical experience in farming. On the other hand, farmers who spent years on the field have no access to these institutions. To bridge this gap, first farmers should have access to the universities. He proudly stated that due to the efforts of his team, M. G. University approved diploma courses in agriculture for farmers. However, most farmers were high school graduates or had little formal education; whereas the minimum eligibility criterion for joining a diploma course was higher secondary. Once again, he intervened to modify the eligibility criteria in a way that admits high school graduates also to this course. Later, the Inter University Centre for Organic Farming was set up. This institute has attracted people from across the country.

A third aspect, according to Damodaran, plaguing organic farming is the lack of meaningful research. He alleged that existing research focuses on comparing organic and inorganic farming. Instead, he advocated the need for research that proves organic farming is a success. To this end, he recalled that once when he met a nanotechnology professor, he asked him to work on the properties of pumpkin skin, having experienced the way in which it lasts for a year or so without decaying. One of the students who attended this course went on to develop a research proposal for cancer cure. Another student of his undertook a farming project on 1000 acres at Kambam, Theni. Before starting cultivation, he fertilized the soil using green manure and built check dams to ensure water harvesting. “The idea of setting up an organic university is also in progress,” hinted Damodaran. He then confessed to the members of the Krishi Kutumbam (organic market), “The one field where I failed is the marketing of organic produce, which your community (Krishi Kutumbam) in Thiruvananthapuram has been successfully running. Hope this continues. Our dream slogan is to eliminate the class of farmers and universalize the practice of farming. Let farmers become educated, let the educated professionals, doctors, engineers, academicians, military personnel, everyone take to farming as well.”

Therefore, having identified three issues affecting the success of organic farming, such as absence of recognition to farmers, lack of farmer’s access to knowledge, and lack of meaningful research, Damodaran proceeded to define his perspective towards organic farming.

He began, by stating that *Krishi* (farming) is simple. Every child, irrespective of race, caste, color, and nationality is divine at birth. He asked, “Why do they grow devilish by the time they grow up? Where did we go wrong? Food, health and education. We have to intervene in these three areas to recover the health of the individual, family, society, and environment.” He emphasized that we must not limit ourselves to eating organic food. Beyond eating good food, it is a way of life that spreads across different areas. He recalled running a 20-day course called *vanaprastham* in Muvattupuzha, Ettumanur, Chalakudy, and Thrippunithura. The aim behind the course was to realize happiness through physical and mental health. He stated, “Every time, my message to the attendees is that we must not compromise on our health. Don’t look at the price. If you think good quality food is costly, grow your own food. Mothers have a huge role to play. Look around. Our food, air, and water are contaminated. Who contaminated these? Is it any plant or animal? It is us humans. Further, among humans, is it the younger or older generation that has poisoned the environment? It is the older generation of human beings, like us, who have poisoned the environment”. He explained that only a divine body can give birth to a divine child. *Pettamma* (biological mother) is the one who gives birth to a divinity called child and raises him or her. It is the quality of selfishness which helps them do that. When mothers extend that selfish quality to start caring for other children, like their own, they become *pottamma* (social mothers). Finally, when she begins to care for the whole world, she becomes *jagadamba* (world mother). He concluded by stating that this transformation of womanhood from *pettamma*, to *pottamma*, and finally to *jagadamba* is India's concept of motherhood. Only women can create good men. He called for mothers in the room to pledge that her child eats only poison-free food.

Damodaran defined that *Paristhithi* means environment. The study of the environment, according to him is nothing but the study of one’s own neighbourhood. He continued, “The Indian concept of environment is elemental (composed of the five elements: ether, air, fire, water, and earth). These elements which we think are lifeless are, in fact, the very constituents of life. The quality of these elements is important. The food we eat comes from these elements. The quality of egg and sperm is dependent on the quality of food which depends on the five elements. If the next generation has to be better, we must correct the five elements constituting our food. Again, humankind will improve if their mind thinks right which in turn depends on a healthy body. As per Indian wisdom, *anandamaya kosham* (happy body) is a state attained when progressing from *annamaya kosham* (food body/physical), through *vijnanamaya kosham* (wisdom body). Thus, food comes first. Here in lies the significance of farming.” He declared that there are organic farmers who reap happiness, if not great money. He pointed out that in

modern farming, we get profit but neither happiness, nor health. Besides, farmers are neither respected nor recognized. He lamented, “In my journey from Ernakulam to Thiruvananthapuram, except at Haripad, I didn't find any shop on the roadside that sells only organic vegetables. Thus, one can imagine the shortage of organic food. The availability of poison free food is less than 2% of the total produce available in the market. In organic farming, the health of soil is very important for the health of the plant. *Jeevante naathananu mannu* (soil is not inanimate, it is the source of all life). We have forgotten this truth and must try to bring back an agroecological design.”

He explained that Agroecological design is possible for those who have at least half an acre of land. 10 cents of it should be reserved for wild plants and trees, resembling a forest. The remaining part should be cultivated organically. This results in a micro climate gradually. He added, “Start loving our body, respecting your body. Such a person can love the soil, other human beings and the environment. Do not seek validation from outside, from others. You compete against your own greed, and weaknesses. When we practice organic farming, we are validating ourselves by putting ourselves first.”

Thus, Damodaran offers a perspective of organic farming which is linked to happiness as the ultimate goal. He calls upon women in their role as mothers to take the mission of creating a healthy generation in the future. He advocates an agroecological design that combines silviculture with agriculture. Through these means, he takes organic farming beyond an individual pursuit of growing safe-to-eat vegetables to a societal mission for happiness.

5.3.4 Translating the Law of Nature: Becoming an Ecological Shaman

After having introduced the term agroecological design, Damodaran proceeded to explain the essence of this practice. He elaborated what ecology means. He stated thus, “Ecology, in other words, nature’s law translates into *prakrithude dharmashastram* in Malayalam. Ecology is about interdependence and cooperation. Just like arts, ecology is ingrained in us, in our very being. People dropped atomic bombs because they failed to realize the fundamental law of life which is interdependence. Every person is a treasure house of knowledge. When a beetle attacks a banana plant and the plant falls, it speaks the language of ecology. To our poor minds, it seems like a pest attack and we try to eliminate the pest. However, the beetle attack gives us a clear message that the soil/environment is not favourable for the plantain’s growth. It is deficient in nutrients required to feed a healthy banana plant. Our efforts must be directed

towards strengthening our plant, rather than killing the beetle. Likewise, the language a dying plant speaks is that it needs water and food.”

Michael Harner (1980), in his book *The Way of the Shaman* writes,

“Shamanism represents spiritual ecology. Shamanism is not about the simple veneration of nature, it is about a reciprocal spiritual communication that restores the lost connection that our human ancestors had with the amazing, spiritual power and beauty of our garden called Earth” (p. 40).

Like the indigenous shaman, who bridges the world of humans and other-than-humans, here Damodaran, by decoding the message of the beetle and the dying plant, translates the message of ecology in general to urban gardeners. Thereby, he is acting like a shaman of ecology in contemporary urban Kerala society which has disconnected from nature. He tries to restore the lost connection by highlighting an ethics of liveability for all beings. He uses “a grammar of animacy” (Kimmerer, 2013, p. 64) as opposed to the language of science used by agricultural scientists and formal training system.

Damodaran continues, “The most common excuse cited is lack of time, space, and labour support. Don't trick me into believing you have less space and less time. I know of people who farm in three cents for his family besides selling the surplus to others. I know of another man who cultivates 7.5 acres of leased land without owning any cattle or having labourers. He uses cow dung from the neighboring cattle owners. His water management is notable. When rains begin, he diverts excess water from the field into the canal, thereby preventing water logging. In my ten years of experience observing farmers across the state, I can assure that anything is possible if we have the will. There is a seventy-eight-year-old man who, accompanied by his daughter, attended our course. When a fellow course mate asked him what the point of attending farming courses at the fag-end of one's life was, he emphatically stated, ‘As long as I can crawl to my banana plant, I shall continue to farm.’ Such is the commitment towards farming.

In Damodaran's opinion, the government is doing very little to promote organic farming. Much of the success is as a result of the respect for life and farming in the hearts of a handful of passionate people. It is a people's movement. “There are people who grow plantain, and coconut palms on top of a three-storeyed building”, he rejoices.

In this manner, Damodaran concluded the forenoon session by emphasizing the need for willingness and recognition of interdependence of all forms of life on each other. Following this, the class broke for lunch. The participants were served local cuisine such as tapioca, fish curry, rice, *aviyal and sambar*. The next session of Damodaran's training class was held in the

afternoon and focused more on a variety of inputs for organic farming, followed by answering queries from the participants of the session.

Afternoon Session

Damodaran began the post lunch session stating that an important challenge facing the farmers is the lack of availability of quality inputs. For instance, he pointed out the need lime to regulate the pH of a very acidic soil. In his observation, Dolomite is cheaper than *kummayam* (lime – $\text{Ca}(\text{OH})_2$), but adulterated. He suggested clamshell powder (calcium carbonate) as a better alternative. He stated that different pH supports different microbial forms. Certain bacteria thrive when the pH is below 6. When plants lose strength due to calcium deficiency, borers attack. Kerala's soil is 98% acidic. Due to heavy and continuous rains, calcium is leached. The next step is to increase the carbon content in soil to at least 3 % and up to 8 %. Carbon is stored in the plant body. When leaves degrade, the soil becomes black and carbon is restored to the soil. He urged the need to sequester the carbon and suggested we use machines to test the level of carbon in our soil. He reminded that the color of soil must be black as we continue farming. He explained that the food we eat, the fuel we use, all are made of carbon. The storage capacity of carbon is immense. Sunlight is the source of all energy. Plants store the sunlight in the form of carbon. When plants die, indirectly they add sunlight to the soil. This energizes the soils. First step in learning about our life is learning the life of soil. Hence, he urged the audience to stop burning dried leaves, instead suggested adding a little cow dung to dried leaves, which accelerates their decomposition and sequesters carbon into the soil. He asked to harvest sunlight by planting trees as no other surface is capable of processing sunlight; the fundamental natural resource being the sun. He stated that food, water, air, all are various forms of sunlight and hence he asked to make soil carbon rich.

Next to carbon, he spoke about enriching fat content by adding meat waste into compost. He recalled that earlier, in the Cherthala-Alappuzha regions, *matthi* (fish) used to be thrown in coconut farms. He suggested the following tips- *Kanthari* (chili variety) can be revived by adding fish waste. Umikkari (charcoal of paddy cover) is activated carbon. It can be added to pipe compost for speedy decay. To enhance magnesium content, magnesium gives the green color of leaves, we can use unadulterated dolomite. He reiterated that if we promote organic farming, organic waste management won't be a problem.

For growth, Damodaran said that Urea is found in urine and hence one litre urine diluted in 5/10 litres of water as per the need will suffice. He said plants require protein to bear fruits. Groundnut cake, fish, and meat waste supplies protein. Pure groundnut cake turns milky when

diluted with water. To integrate carbon, fat, protein and urea he suggested applying diluted urine, cow dung, and groundnut cake every four days. He added that human waste is also a good fertilizer, mainly for onions. He pointed out Jains have an ecologically sound way of corpse management as they allow vultures to feed on corpses. He informed that *Umikkari* is a biochar as Ash is a fertilizer but cautioned that we one must not burn leaves deliberately to produce ash. He suggested a means for speedy degradation of coconut palm and the like that take a year to degrade by cutting them into pieces and adding cow dung. He suggested adding bacteria cultured from a lab to cow dung, which indicates that he was not advocating against biotechnology in itself. He justified it by stating that the success of organic farming depends on the rate at which we make the organic nutrients available in a ready-to-use form to the plants. He gave an example of how adding *umikkari* to a dead rat helps in quick odourless decay. Damodaran opined that the organic fertilizer industry is a prospective industry. Clam shell powder, for instance, has already become a profitable venture. He stated the example of Bitter gourd growing well if you add fertilizer and water every fourth day. He also mentioned other elements required for plants such as Phosphorus as the basis of life. He said, it is found in oilseed cake and bone meal. Bio potash is also available in the market. Most organic gardeners face problem with red soil as it lacks carbon. Hence, he said that red soil is better when it becomes black, and therefore asked to enriched it with carbon.

He persuaded the audience to take steps on their own towards organic farming. He stated once again that, Indian society was built on values such as providing knowledge, education and health free of cost. He asked people not to wait for an avatar or the government to take action. He recalled, “When I mooted the idea of a model school, it was completely funded by organic farmers. We must not pass on our mistakes to the next generation. Vanaprastham is devoted to creating such institutions and practices that reflect ecological thinking. Please share knowledge with others. He pushed forth his slogan, “ Know, practice, experience, and share.”

Finally, he spoke about the last but important ingredient. He said, “Out of the five elements, ether is experienced through sound and vibrations. Music is the best way for that. Nature has a rhythm, the body has it too. When the rhythm is not in sync, diseases occur”. Waste accumulation, acidity, nutritional deficiencies, and rhythmic imbalance need to be corrected. If we add salt to curd, it kills probiotics. Aerobic composting leaves no smell, but anaerobic composting, such as what happens in biogas plants, does.

After talking about inputs, he spoke on weed management. He said weeds are soil nutrient balancing agents. *Keduvalam* refers to the nutrients in the soil that are not useful for plants but allow weeds to grow. He suggested removing weeds right beneath the plant, but not uprooting

the weeds growing in the vicinity of plants. He asked to mow the ground and use them as green manure. He added that for short term plants, green manure is better, whereas for long term plants like coconuts, dried leaves are better.

Thus, unlike formal training classes run by agricultural scientists which focused more on organic substitutes for NPK (Nitrogen, Phosphorus and Potassium), Damodaran focusses on enriching the soil as the first step. This is evident from his suggestion to correct the pH of the soil. Moreover, he takes a holistic approach and a wider nutrient base beyond NPK in the form of carbon, protein, and fat. This reflects his ecological approach that doesn't differentiate between plant body and human body. Instead, it looks at life as interdependent on each other, which is evident from his listing of human excrements as a potential fertiliser. Just like any living organism is made of carbon, protein, fats, and minerals, plants also need the same nutrients in his view. He also cautions against using cheaply available adulterated organic fertilisers such as dolomite. Further, his reference to the traditional practices of fat enrichment used for coconut crops in Alappuzha (coastal district north of Thiruvananthapuram) points to the fact that agroecological knowledge is often derived from practices specific to a place. Finally, by pointing towards the role of intangible inputs such as music as an important ingredient that adds rhythm to life, he adds non-material inputs into focus in organic farming. The final phase of the training class was Damodaran's interactions with the audience to address their queries. The following is a transcript of the Q&A between Damodaran and the participants of the training class, which sheds light on the most common concerns of organic farmers.

Q1. What do we do to combat wild animal attack on our farms?

Damodaran: Pigs and elephants attack agricultural lands. Indigenous people have used their creativity and come up with many solutions. Bamboo circles can be used to trick the pigs into believing it is a trap. Another method is to use net traps. At other places, elephants and pigs can be scared away by creating sounds that mimic their own cries.

Q2. How do we deal with chelli on coconut palms?

Damodaran: Red chelli is harmful, black is not. Oil filled cotton bag can be hung on either side of the coconut palms. If the kombu (flower) breaks, it is due to the loss of fat content. The final product of coconut is coconut oil; hence, coconut needs fat. Apply coconut cake, or fish waste. All oil cakes are good fertilizers.

Q3. How to grow earthworms?

Damodaran: Don't use the ones from vermicompost. Get a few native worms and multiply them using cow dung. Correct the pH to deal with nematodes and viral diseases. Modern rice mills have umikkari(biochar).

Q 4. How to deal with pests?

Damodaran: Like I said earlier, all we need to do is prevent pests, and strengthen the soil, not kill them. After correcting the soil, the next step is to protect fruits and leaves. Agriculture also develops one's intelligence. A combination of bitter, pungent, hot herbal remedies help in deterring pests. Kanjiram, amruth, karingota extracts are a few. Add cow urine also to the extract. Lemon, panikurka, and cow urine is another remedy. Crushed street grass (vat pullu), neemcake and chilies is also effective. Papaya leaves, raw papaya with skin, bitter gourd, all are bitter. Around rubber plantations, kanthari grows very well. It is because of the rubber leaves. Make your concoctions as diverse as possible. Hybridize the soil. The more diverse the soil bed, the more sustainable it is. Bio waste, plant and animal remains make the best soil. An example is that of a man who asked me to visit his farm. He had raised a snake gourd as thick as a foot and as long as a snake. Besides the use of multiple plant and animal waste, he had added the waste of silkworms. Every farmer needs to become a researcher. Note down your experiments, discoveries, your progress, failures. Common people by dint of his research have found many things which even scientists have not found. Likewise, in another case, one man's cattle were affected by mosquito bites. One day he observed that hens were eating mosquitoes. He bred the hen and sent the chickens also around the cows. Such is the benefit of observing keenly.

Thus, the Q and A sums up the essence of the ecological approach advocated by Damodaran. When asked about pest management, once again, he pressed for creating healthy soil, rather than suggesting remedies to kill pests. Damodaran offers a holistic framework to become an organic farmer. The knowledge he imparts to the audience is born from his experience as a farmer and his observations of certain traditional practices in Alappuzha. His training reflects context specificity and he too urges the importance of knowledge born from a farmer's own observations. This stands in contrast to the standard formula advocated by scientists.

5.3.5 Competencies through Other Means: social media

Not all urban gardeners in the city can attend in-person training (formal or informal) such as those mentioned above. There are issues such as frequency and timings of these training classes which often compete with other priorities of gardeners, besides mobility issues for gardeners

living far away from these training centres. Besides these training classes, organic gardeners in the city enhance their competencies through the virtual media such as YouTube, Facebook, and Whatsapp, forming online communities of knowledge sharing and exchange with respect to urban gardening. The following narratives illustrate the same.

Anandan - Finding a mentor through Facebook

Anandan recalled, “I once remember enrolling for a grow bag distribution scheme in the Thriuvallom Krishi Bhavan upon persuasion by a relative of mine. Even after providing all details and supporting documents, I have not heard from them for long. Krishi bhavans take a long time to respond and their services are poor. On the other hand, when I contacted Shanu, via facebook, he responded immediately with great enthusiasm and came over to my home in Thiruvananthapuram from Kollam. He supplied grow bags with soil collected from his own farm land, saplings raised in his place and also set up an irrigation system. It cost me around 12000 for the entire process; however, his dedication and the assurance of quality is unparalleled. Once when I reset my garden for the second time, I posted a picture on Facebook, giving courtesy to Shanu. He greatly appreciated it. We need a godfather who is an expert and a selfless motivator. Shanu is one. He tells me about the pests' cycle. We need to know when they are active and he advises me to check my garden early in the morning. In the beginning, my cabbages were tiny in size with few leaves spread out. Shanu suggested folding the first leaves to form a ball-like shape, allowing the plant to produce more leaves from within. Earlier I was not interested in cultivating organically, but thanks to Shanu, I picked up interest.” Thus, Anandan’s statement points out the need for personalized and prompt support at the right time, along with mental support in the form of encouragement, which many novice gardeners expect, but do not get through official sources such as Krishi Bhavans. Thanks to Facebook, Anandan could connect with people like Shanu, who was willing to offer comprehensive support and service for gardeners at a price they both agreed upon.

Komalam - Learning from YouTube

Komalam, a 63-year-old gardener stated, “I have attended around 4–5 classes related to gardening. Sometimes they talk about complicated techniques, such as grafting which I am not very interested to try. The rest I learnt from YouTube. I watched a lot of YouTube videos and maintained at least three books for this purpose. Above everything, self-experimentation is the best way out. People who get awards and popularity keep their gardening secrets to themselves.

I bought a smartphone mainly for maintaining contacts related to gardening. Also, thanks to this device, I can see my friends and fellow gardeners doing miracles in farming. Here are some of the things I learnt online. Cow dung, groundnut cake, and neem cake are important fertilizers. I mix these in water and leave them aside for five days. After fermentation, I dilute it with water, five times that of the mixture and apply to the plants. Neem cake acts as a nematode control agent. Groundnut cake, *seema konna* and drumstick leaves are insecticides cum fertilizers. Besides, I prepare egg amino acid and fish amino acid. Fish amino is prepared from *Mathi* (fish variety). *Mathi* contains omega 3 fatty acids. Take equal parts of fish and jaggery. Keep aside for a month. It gives a nice fruity smell after fermentation. Strain the mixture, dilute it, and apply. To prepare egg amino, egg is soaked in lemon juice for a few days. Dilute the mixture at the rate of 5 ml in one litre. You can spray this on leaves and other parts of the plant. I learnt all these from online sources like YouTube. Based on my experience, I verify the information available online and take whatever suits me. *Jeevamrutham* and *panchagavya* (curd, milk, ghee, cow dung and cow urine) are some other organic fertilizer preparations we can make in our homes. I learnt to grow oranges by removing the outer skin of a seed from a tasty orange. I cover the seed in tissue paper and leave it aside for roots to form. Once the roots have formed, I move it into a pot. I learnt this too from YouTube.” Komalam’s opening statement indicates that training classes are not demand driven and hence may contain topics which are not relevant for gardeners like Komalam. Further, she is skeptical of learning from people who gained name and fame as rooftop gardeners, reflected in the statement that such people may not share their secrets. On the other hand, she believes that social media such as YouTube offers her greater choices and is a place to learn many things. It can be seen that Komalam mainly learnt to prepare organic fertilisers such as fish amino, egg amino, *jeevamrutham* and so on. The processes to make these are only explained, not demonstrated in training classes, whereas on YouTube, one can see the way in which they are prepared. Further, by mentioning the way she raised oranges by watching YouTube videos, Komalam hints that YouTube provides a means for her to experiment with growing exotic fruits, whereas conventional training classes focus only on growing vegetables. In this manner YouTube expands her competency as a gardener in ways many training classes by experts and model gardeners do not.

Shyamala - Connecting through Whatsapp Groups

Shyamala is a sixty-year-old rooftop gardener. She is a widow and lives alone at her home in the city. She says, “I keep myself engaged by travelling for various agriculture meetings

organized by different groups. Next Sunday, I am going to attend a meeting organized by *Pachhappu* (greenery), a Whatsapp group founded by a man named Sony from Kottayam. I am the group's admin(administrator) for Thiruvananthapuram district. I was moved by the group founder's idea to make our state self-sufficient and recover greenery across the state. Most importantly the group promotes technology-based innovative solutions to make us independent. For instance, I lost many mangoes due to lack of equipment to pick them. Even if I hire labor, I have to pay 800 rupees every time. From the group, I got to know that there are foldable long poles with hooks to pick fruits. Similarly, the group provides guidance for food processing and value addition. Earlier I used to discard the *chakini* (inedible fibrous skin covering the fleshy fruit) of jackfruit. Now, I make use of this part and there are marketing possibilities as well. Another good thing about *Pachhappu* is that unlike most groups that contain one or two administrators who act like they know it all, its governance is decentralized, like the roots of a tree. The founder has no vested interests. Every time we feel like quitting gardening, the presence of these groups encourages us to keep going. Besides, we get to exchange good quality seeds with each other. From *Pachhappu*, I bought three types of lotuses—blue, white and rose—as well as black, yellow, and red tomatoes. Besides, I bought beef tomatoes (American variety), and banana passion fruit. Haritha Keralam, Krishi Bhumi, and Hope are some of the other good WhatsApp groups. Hope is like a mother of all groups. It was founded by Muhammad Kutty. He is known to us dearly as Baputikka. His wife is a cancer patient. For a few years he worked abroad in the gulf and then returned to Kerala and began fighting against cancer. He brought attention to the leading cause of cancer, our lifestyle. Baputikka runs a trust that supports organic gardening and farming. He supplies growbags, coir pith at prices lower than market prices. Above all, the meetings organized by Hope are an opportunity to meet like-minded people across the state. We forge life-long friendships. Hope charges only 100 for attending its meeting. Classes happen till noon. Post noon, we have lunch together and share seeds and saplings. Most of the class is devoted to pest management. Pests are fewer on the terrace, when compared to the backyard. I went on a tour with one of our groups to North India. We went up to the Wagah border.”

From the above account, it is clear that joining WhatsApp groups has enabled elderly widows like Shyamala who lives alone in various ways, such as learning technical solutions to avoid food wastage, being part of a larger purpose as administrator and promoter of gardening activities in her region, besides connecting with these group members face to face, eating and travelling together and having a social life.

5.3.6 Observation from Experience

Sometimes, competency, the result of years of practice, observation and experimentation impacts gardening experience. Nikhila, a homemaker and gardener says, “Ladies’ fingers, peas, spinach, cucumber can be grown all year round. This is *njatuvela* calendar. A farmer can plan his farming according to this calendar. Whenever I get some doubts, I refer to this. I think I got this from krishi bhavan. *Thiruvathira njatuvela* (apparent movement of the sun across the zodiac belt comprising the star called *thiruvathira* for 15 days) is good for growing a number of crops. We have sunlight during the day and rain in the night at this time. There is a proverb that goes ‘Even if you cut your finger it will grow in *thiruvathira njatuvela*!’

Some people suggest adding harmless chemicals alongside, such as ammonium or potash. Being an organic gardener, I know the limit to which a plant grows. Sometimes, I add ash instead of potash. Once I added some to get rid of *velleecha* (a pest affecting chili), but the whole plant died due to the ash effect. One can only guess what would have happened had I added potash. Biogas slurry is sufficient for ivy gourd. Even when I didn’t have biogas, I would only water the ivy gourd; yet it would give me lots of fruits. Ivy gourds are like that. Sometimes we have to wash off the entire plant. My *agathi* plant caught white fungus. I scraped the entire plant and washed it. Sometimes there are worms. It will turn into a butterfly. Such worms need not be killed. People often complain that spinach seeds are eaten by ants. We need to spread rice powder around the spinach bed. If we do so, ants will eat the rice flour and leave the spinach alone. Similarly, chillies must not be sown very deep inside the soil, just a finger deep. I don’t prefer giving people stem cuttings as the success rate is very low. Once a friend of mine from Dubai sent me a Pakistan grown golden mulberry. It was brought to India by his wife who mailed me the stem cuttings. I followed all the instructions such as covering it with plastic to allow humidity and I would examine it every day out of curiosity. However, it didn’t bear fruit. So, I know what it’s like to give your money, time and energy into raising a plant only to see it go in vain. I don’t want others to go through the same trouble. Hence, I don’t give stem cuttings, instead I raise the seedlings to a particular stage and then give them. There is a technique to cut the stem from the mother plant. In the case of dragon fruit, after one fruit has formed, we need to cut at the place where new buds form, because roots sprout from those nodes.”

Factors such as time, and climate do not feature predominantly in formal training classes on rooftop gardening. Nikhila’s own experience has taught her important lessons in gardening such as checking the traditional agrarian calendar for the best time to sow. Besides, the impact

of fertilisers, and identifying potential parts for propagation of exotic fruits like mulberry, dragon fruit, and so on were not learnt from training classes or online sources but from observation and experience. These lessons are long standing in the minds of the gardener as these are learnings by doing.

5.3.7 Community Gardening Activities

In Kerala, due to space constraints community gardening activities are not common. However, during the study, a gardener named Sumam recalled her experience of gardening with her fellow residents on a vacant plot in her locality. She says, “Krishi Kutumbam group organized a competition in which the members were asked to promote gardening in their neighborhood. Our residents’ association (Kaavalloor Residents’ Welfare Association) is one of the best in Thiruvananthapuram. Every resident is cooperative. One resident leased his vacant plot to us. We contacted the karma sena of Kudappanakunnu Krishi Bhavan to plough, prepare the soil and set up pandals for climbers. We also contacted Dr. Usha, a professor at Vellayani Agricultural College, who gave us appropriate guidance. We formed a WhatsApp group, and assigned members to monitor each day. We farmed successfully. The agricultural minister of state came for the harvest. Motivated by the success, we cultivated the plot once again. After that, we couldn’t continue, as the owner’s son had to build his home there. Later we cultivated a *pana* (erstwhile paddy land, converted for growing plantain). Here, we again sought the help of the karma sena to sow bananas while we took care of subsequent requirements. Every time the bunches were ready, members would come to help and the fruits were distributed among the members.”

Sumam’s experience shows that the community involved karma sena for more demanding tasks and sought the help of agricultural scientists for guidance. This shows that the people value scientific knowledge and technical assistance, as and when the situation demands, although these are not the only means by which they enhance their competency.

5.4 Conclusion

This chapter listed various sources that support and enhance the urban gardener’s journey into organic gardening. What emerges is that urban gardeners make use of knowledge and information which includes but are not limited to formal institutional training in agriscience

focusing on producing organic food. It extends to and is supplemented by informal ecological science focusing on overall healing beyond physical health and extending to mental and environmental happiness. Formal training systems use a language of science, focusing on providing knowledge about the nutritional value of vegetables and various other inputs. They support and collaborate with model gardeners who make their own fertilisers and pesticides. The gaps in this system are its human centrism, and outlook towards nature as a material input for human well-being, defined in narrow terms of meeting dietary requirements, preventing cancer and other emerging diseases. There is little focus on kinship between people and nature. These gaps are supplemented by ecological shamans, like Damodaran, who act as a bridge between the modern gardeners and nature. By highlighting the interconnectedness of people with nature, he emphasizes what traditional shamans do, which speak to both the worlds that have been disconnected due to a crisis. Here, urbanites in Kerala face a crisis that goes beyond unsafe food and extends to psycho-social disconnect. They try to reconnect with each other and with nature through gardening. As mentioned in the previous chapter, gardening is an animistic performance of kinship. Therefore, the competencies for gardening are gained by training not limited to knowing material inputs but also by having an embracing outlook towards fellow life forms with which we share the earth. Thus, competencies and know-how around urban organic gardening in Thiruvananthapuram city is collectively built through both formal and informal means. While the former involves and employs the language of science, technology the latter relies more on one's childhood experience, ingenuity and creativity, experimentation and so on. Besides, it also involves filling the gaps left by formal sources by coming together as gardening communities, inviting experts in farming other than agricultural scientists, sharing seeds, and self-learning using social media platforms.

Chapter 6

Conclusion and Recommendations

The concept and practice broadly termed as urban agriculture challenges one of the defining features of the city as the place where people are not primarily engaged in producing food. Although not new, since the beginning of this century, urban agriculture has gathered increased attention in media and policy circles across the world. However, 1) What are the particular socio-cultural circumstances in which such practices evolve? 2) Who are the practitioners and what are the meanings they attached to this practice? and 3) How can ethnographic studies of urban agriculture enhance our existing understanding of the city and human-environmental relations? This study set out to explore the above questions. It began by revisiting existing theorising of cities, the relation between city and nature, city and food, and also examining the history, variability, and existing scholarly approaches to the practice of urban agriculture.

A review of literature in this area pointed out the varied historical conditions in which urban agriculture emerged, such as war and food crisis in some parts of the world. It also revealed the spectrum of practices and goals that come under it ranging from large community gardens and industrial urban farming to indoor, rooftop gardening and organic food gardening. Pointing to the preoccupation in academic and policy literature with food security and urban poor when it comes to studies of urban agriculture in the global south, a study in the Indian city of Bengaluru by Frazier (2018) has brought our attention to how differential and conflicting claim to the city is raised by practitioners of urban agriculture such as the new, young middle class organic terrace gardeners in the city on the one hand, and traditional city based horticulturist communities on the other. Thus, Frazier's work urged the need to take the discourse of urban gardening beyond urban poor and food security to include groups such as middle class and spaces such as rooftops, and thereby expand our understanding of forms of urban agriculture in South Asia. My study is inspired by these early attempts. Although Frazier's study has set an example for a context-based study of urban rooftop gardening in India, it still represents the case of a large metropolitan city. As is the case with urbanization, the practice and context of urban gardening is not uniform across Indian cities. Other smaller cities in India have also taken up rooftop gardening such as Thiruvananthapuram and Kochi in Kerala. Unlike the case of

Bengaluru, which was a self-driven movement by young middle-class professionals, in Kerala, rooftop gardening, is a state supported organic food movement for more than a decade now. Beyond media reports, the practice of rooftop gardening in this state has not caught the attention of social scientists. The present study aimed to address this gap and focused on the city of Thiruvananthapuram in the south Indian state of Kerala.

The immediate circumstance in which urban agriculture in the form of rooftop organic gardening gained momentum in the city is as follows. Today, Kerala is dependent on its neighboring states for most of its fruit and vegetable requirements. Besides, mass media reports of pesticide residue beyond acceptable limits in vegetables imported into the state led to a situation of collective precarity. This led the government to formulate a policy of 'self-sufficiency' in vegetable production, as part of which it supplied grow bags with saplings of common use vegetables at subsidized rates to persuade individuals to grow their own vegetables at home. Besides, training programmes on organic farming began to be organized by agricultural departments, agricultural scientists, popular media and civil society groups. Thus, in the city of Thiruvananthapuram the practice has been promoted in the face of collective precarity involving multiple actors. The study objective involved identifying these actors and the relationships that emerge between them in built environments. The study used the methodology of relational ethnography and fieldwork methods involving sensorial engagement in the garden besides interviews to map out these relations by attending to points of contact and conflict. It used the framework of social practice theories to look at urban gardening as an everyday practice consisting of three elements- meaning (why), materiality (what), and competencies (how). Since gardening is a social practice that involves not only humans but also non-humans such as plants, pests, and things, it adopted concepts from more-than human urban studies that emphasise the role of entities other-than-humans/non-humans in studying social practices in urban environments. Therefore, concepts such as 'assemblage' and 'becoming' (Deleuze & Guattari, 1987) new animism have been used, and ecological shamanism coined in this regard. The following section summarises and puts forth the major arguments of the thesis.

6.1 Summary and Arguments

Firstly, as mentioned before, the peculiar circumstances that led to popularising urban gardening in Thiruvananthapuram are the collective precarity in the form of lack of self-

sufficiency in vegetable production and health risks to the urbaners from imported food reported and tested to contain high amounts of pesticide residue. Consequently, although the State seeks to engage every urban citizen with a home of their own in rooftop gardening in the city of Thiruvananthapuram, this study found that it is predominantly practiced by elderly urban folks. Out of the 150 gardeners interviewed in the study, most of them were aged above 60 years.

Majority of them had retired from formal employment and lived with their spouse in a two-member household. Male gardeners outnumbered females. This observation contradicts many literatures which argue that women, being managers of home are more likely to engage in home gardening than men (c.f; Howard, 2006; Mitchell & Hanstand, 2008; Zasada et al, 2020). Economically, most were earlier involved in non-agricultural activities, in tune with the changed economic situation in the district and the state as a whole since the 1970s. Their economic status corresponds to middle income category. Their educational status ranges from secondary schooling up to higher qualifications such as PhD. The religious profile of the gardeners reflects the multi-religious composition with Hindus, Christians, and Muslims involved in the practice. Caste and agriculture are intricately linked in the traditional feudal society. The social status of urban gardeners indicates that most were Hindu Nairs, and Ezhavas, the erstwhile agrarian communities and their farm labourers respectively in the district. While this may indicate their familiarity with cultivation practices, one's caste did not determine their motivation to take up urban rooftop gardening. This is evident from the way majority of the gardeners identified rooftop gardening as a secular activity.

Further, the entry of erstwhile priestly classes such as Tamil Brahmins into urban gardening indicates reasons such as rising health consciousness, mass propaganda and collective precarity shared by everyone in the city. Most gardeners were natives of the district. Among migrant gardeners there were intra-district and inter-district migrants. Although many gardeners perceived themselves to be healthy, the elderly gardeners suffered from major lifestyle diseases such as diabetes, hypertension and cardiac diseases. Overall, women gardeners were more morbid than male gardeners. This is reflected in the predominance of male gardeners over females.

As to the second question of meanings attached to this practice, the study finds that rooftop gardening in the city reveals multiple meanings beyond self-reliance and food safety by exposing multiple precarity in which people in Thiruvananthapuram city find themselves.

Many actors are involved in the process, such as the state, civil society, agricultural department, agricultural scientists, and elderly gardeners. Each of them offers varied views on organic farming in general and urban home gardening in particular. For instance, the State views rooftop gardening as a means to achieve its larger goals of self-sufficiency, food safety, and urban household waste management. Regarding ensuring food safety, it has entrusted experts to test for pesticide residue by setting up a pesticide research and residue lab and releasing monthly reports. The scientists in turn certify vegetables as ‘safe to eat’ based on whether the residue is present ‘beyond acceptable limits’ set by institutions such as FSSAI (Food Safety and Standards Authority of India). The narratives of agricultural officers and former scientists point to more pressing issues such as withdrawal of people from agriculture due to urbanisation, urban food security, farmers’ plight and issues of inputs and yield when transitioning to organic farming on a larger scale, unlike policy’s grand ambitions to move towards an organic state (*jaiva Kerala*). Against this context, they look at rooftop gardening neither as a means to self-sufficiency or urban food security but as an elite hobby pointing out the exoticism in the kind of fruits and vegetables that the gardeners cultivate and alleging lackadaisical attitudes of urban folks towards gardening.

Nevertheless, according to the scientists and agricultural officers, since large-scale organic cultivation is utopian, rooftop gardening is an opportunity to practice organic farming on a small scale and to effectively manage household waste. Non-governmental organisations also locate urban home gardening as part of a more significant social movement for food safety and urban waste management. However, unlike agri officials, they believe it is possible to achieve food security albeit gradually through organic cultivation if it were not for the pesticide lobby. However, when it comes to the urban gardeners, meanings of urban gardening go beyond policy goals of self-sufficiency and waste management to those such as pursuit of pleasure and happiness, health, making a home in a new place, spending a fruitful retirement life, empowering oneself, and so on in a precarious climate of rapid urbanization, migration, changing lifestyle, rising consumerism, deteriorating health due to diseases such as cancer, sudden losses such as widowing, and exposures to food toxicity. Hence, through multiple meanings, this study shed light on urban precarities in contemporary Thiruvananthapuram. It detailed how people perceive and experience precarious urban life through their own and others’ exposure to various types of toxicity. It also highlighted the effective role of social media and responses to media activism by the state in dealing with collective risk. According to the gardeners, the word *jaivam* (organic) meant completely free of industrial chemicals which they referred to as *visham* (poison). For them, *visham* is an all encompassing term that

applies to all and any chemical used in conventional food production, including chemicals such as urea. However, agricultural officials and scientists consider industrial chemicals used in conventional agriculture such as urea as necessary if applied judiciously. Also, the experts defined jaivam (organic) in quantitative terms such as the percentage of carbon content. On the other hand, the home gardeners perceived organic as anything other than ‘chemical’. While the scientists and officials who prioritized food security insisted on the inevitability of chemical use in agriculture, gardeners recalled with nostalgia a time when they ate locally produced chemical-free food. Above all, following the gardener’s narratives, what emerges is the role of rooftop gardening in making a house in the city home and life happier amidst multiple precarity. Besides, the gardener’s perspective provides a holistic understanding of food as medicine, appealing to the senses in terms of taste, colour, and size within visual limits, in contrast to oversized, bland-tasting vegetables grown through chemical farming. These perspectives go beyond the narrow mainstream definition of rooftop gardening in terms of growing ‘safe to eat’ vegetables.

The third argument put forth in this thesis is this. More than a human-directed and curated activity, urban gardening is indeterminate and a co-creation of an animistic care world by people, plants, pests, technology, and everyday objects of urban life. Consequently, urban gardening emerges as an animistic performance of kinship, often blurring human-non-human and nature-culture boundaries. Using the concept of “assemblage” and “becoming” given by Deleuze & Guattari (1987), the study looked at gardening as an assemblage of humans, non-human plants, pests and everyday objects of urban life. It looked at the various becomings that home gardening engenders through various stages in gardening from sourcing inputs to sharing garden produce. The process of sourcing seeds and other inputs connect the urban with the rural, as migrant gardeners travel to their native places from the city. Further, sourcing is a stage in which, beyond buyers, often gardeners become vigilant gatherers (picking from roadsides, waste dumps), and their cars become *Krishi Vandi* (farm trucks). When it comes to composting, the institutionally designed composting processes, such as pipe composting are driven by climate and aesthetics and often thwarted by non-human agency (here, worms and ants). At the stage of setting growbags, although the government supplies industrially produced UV sterilized grow bags made of plastic, long-term gardeners also make grow bags by refashioning everyday household objects like old sanitary wares, helmets, bottles, and so on. Once seeds, fertilisers, and growing medium are ready, gardeners move into planting stage. Through planting, seedlings become babies in the womb of the earth. There is sufficient room for spontaneity in this stage as some plants also self-propagate and spoil the gardeners’ plans.

Next comes the tending stage. Tending to the plants on their rooftops creates the small-scale contexts in which relations meet and animate each other (Astor-Aguliera & Harvey, 2018). By referring to J. C. Bose, gardeners time and again emphasized the ways in which sentience is not exclusive to humans. Tending is a process where gardeners recognize this sentience and forge kinship with plants. It is widely recognized that many indigenous cultures have much more animated, agentic and intentional views of the world of nature. This study contents that that not only indigenous cultures, modern, urban communities, such as the elderly gardening community in Thiruvananthapuram also have agentic views regarding nature. Many gardeners addressed plants as their children, thereby attributing personhood to non-humans. The process of tending entails a 'becoming parent' of the gardener and 'becoming child' of the plant. Thus, urban gardening emerges as an animistic performance of kinship between people and their plants. Just like the parent-child relationship that emerges between gardeners and their plants, plants develop kinship with pests. Gardeners use tactic to acknowledge and selectively disrupt this kinship at times and embracing them at other times. Therefore, pest management ranges from taking active and passive measures to eliminate them to distancing and embracing them as beings with right to garden produce. Gardeners look forward to the picking stage and exercise great care. Although garden produce mainly goes for household consumption, it is often shared with friends and neighbours. Besides, some gardeners who are left with excess have formed organic marketing communities where they can sell their home-grown vegetables and fruits. Two such weekly organic markets were successfully running at the time of this study. Advances in communication technology and social media played a huge role in bringing together these scattered rooftop gardeners in the city. As a result, private spaces in the city such as residential parking lots and premises of a local NGO become weekly marketing spaces for urban gardening groups. It also alludes to the role of the middle class in mobilizing spaces, technology and capitalizing on the demand for safe, home-grown food in the city. Beyond being organic market spaces, they become spaces where kinship like an extended family forms between urban strangers who have been brought together by their shared love for gardening. These spaces also address the food precarity faced by urban citizens. Thus, urban gardening engenders kinship at three levels a) people-plant kinship b) plant-pest kinships c) people-people kinships in the city.

The fourth finding is that gardeners acquire skills and competencies beyond the instructions and guidance of science, technology, and social media, through their childhood memories and

an ecological shaman in their midst who helps translate the language of ecology to them and persuades them to look at organic urban gardening as a pursuit of world happiness. The study listed various sources that enable and enhance urban citizens' skills in organic gardening. Unlike traditional land-based agriculture, urban grow bag gardening requires new competencies given the constraints of space, soil and inputs in the city. agricultural research institutions play an important role by prescribing ratios of potting 'mixtures' in growbags and introducing lab-cultured micro-organisms known as 'biocontrol agents' to act as microbio fertilisers and pesticides. Hence, formal sources of knowledge exchange include face-to-face training organised by agricultural scientists and officers at Krishi bhavans, institutional programs by agencies such as Agricultural Technology Management Agency (ATMA) involving model rooftop farmers, and handbooks on pest management distributed by the state magazines relating to organic rooftop gardening. Further, to build competencies for urban gardeners, the state government has set up an Agro bazaar, a one-stop shop to buy all raw materials required for rooftop gardening. Informal sources of knowledge include memories of childhood experiences in farming. Besides, in some cases, it involves intuitive competencies such as having *kaipunyam* (gifted hands) and curious experimentation. Other informal sources include learning through social media (Whatsapp, Facebook, and YouTube) and training organised by gardening groups involving ecological experts other than agri- scientists. Formal training systems uses a language of science, where the focus is on educating the gardeners about nutritional value of vegetables, and suggesting ways to improving yields from organic cultivation. Although they support and collaborate with model gardeners who make their own fertilisers and pesticides, there are gaps in this system. These gaps include putting humans at the fore-front of the process where nature is considered a material input for human well being defined in narrow terms of preventing cancer and other emerging diseases. There is little focus on kinship between people and nature or the one-ness of life, let alone the meaning of gardening beyond growing 'safe food'. These gaps are supplemented by Ecological shamans such as those, patronized by gardening groups, who act as bridges between, the modern gardeners and nature. By highlighting interconnectedness of people with nature, he emphasizes what traditional shamans do, which is speak to both the worlds that have been disconnected due to a crisis. Here urbaners in Kerala face a crisis that goes beyond unsafe food, to emotional and physical disconnect with nature. They try to reconnect with each other and with nature through gardening. As mentioned in the previous section, urban gardening is a pursuit of happiness through the animistic performance of kinship. Becoming an expert home gardener is not limited to knowing material inputs but to having an outlook towards fellow life forms with

which we share the earth. Thus, competency and know-how around urban organic gardening is a collective collaboration of science, ecological new-age shamans, technology and memory. What emerges is that urban gardeners make use of knowledge and information which includes but not limited to formal training in agriscience focusing on producing organic food. It extends to and is supplemented with informal ecological science focusing on overall healing beyond physical health to mental and environmental happiness.

As Tincea (2020) puts it:

Ecology will become the new ritual of contemporary man and our planet seems to also make an effort to help us move in this direction by giving a good shake to all of us, once in a while, through such collective crisis, as the one we are passing through, in order to reset our behaviour as a collective (p. 5).

In other words, crisis/ precarity can create possibilities for creative intervention which in this case of Thiruvananthapuram implies that **while cities displace nature, they can also emplace it** through practices like home gardening. According to Ortner, “It (practice theory) is a general theory of the production of social subjects through practice in the world, and of the production of the world itself through practice.” (Ortner, 2006, p. 16). Therefore, social practices not only reproduce the world or existing culture but also transform it and creates new culture and new world. In Thiruvananthapuram, gardening is a social practice that is a co-creation of a new world, animistic care world by both humans and non-humans in precarious times. At home and in the city animistic care worlds are created through urban gardening, thereby helping us to a) conceptualise cities as animistic spaces and b) look at human-environmental relations in the city as not always one of human domination and displacement of nature but also one of emplacement, reconnecting, animating and becoming kins to each other as revealed through practices such as rooftop gardening. Hence, in contrast to other qualitative studies on urban gardening that have concentrated mostly on motivations and benefits (that too for human agents), and in line with emerging studies that incorporate non-humans in practices such as urban gardening, this study tried to offer a comprehensive view of the process. Further, this study and its findings are relevant to understand how 1) small-scale contexts such as rooftops are not empty spaces but shared and contested places, 2) social groups, such as the elderly, are not a burden but potential agents of care and change, 3) urban rooftop gardening is not just food growing but a pursuit of happiness through the performance of kinship.

6.2 Recommendations for Policy

Institutional intervention dominates in urban gardening in Thiruvananthapuram, with the agricultural department supplying inputs such as soil, organic fertilisers, growbags, seeds, and irrigation equipment. The experience of gardeners who claimed these services indicate the need to improve in certain areas, and also rethink many of these support measures. The two areas that urban gardeners flagged as needing attention were soil quality and seed quality. Many gardeners reported the poor soil quality in growbags supplied by Krishi Bhavans. Since the process of making the potting mixture is outsourced to other agencies such as agro service centres, and self-help groups, the government must put in a monitoring mechanism to check the soil quality. With respect to seeds, those seeds supplied by Krishi Bhavans do not contain information on expiry date. As a result, the gardeners' efforts often go in vain. Besides, in terms of building competencies, they pointed to the lack of follow-up on the part of the government. As one gardener remarked, mental support is as important as material support in gardening. Even experienced gardeners get dejected when plants die of diseases and pest attack or fail to bear fruits. Gardeners suggest that once a month, agricultural officers pay a visit to gardens, just like they do with farms in rural areas. If experts are accessible to gardeners, the latter will be motivated to continue. Not all urban gardeners are parts of gardening groups like Krishi bhumi and Krishi Kutumbam where they have anytime access to fellow gardeners and experts for discussing their problems. Often social media and Youtube have taken predominance in enhancing capacity of gardeners especially in pest management, composting and organic fertilizer making.

When it comes to irrigation equipment such as drip and wick irrigation technology, As the study indicates, many did not take to these measures as they felt watering is an essential aspect of tending to plants which they preferred doing manually. Further, among those who used these services, many gardeners were dissatisfied with the frequent damage to drips from animal attacks or breakage. Repairing services are not provided by the agricultural department. This applies for biogas plant repair too. Most irrigation and composting services are one time. Regular follow up is essential.

6.3 Recommendations for Further Research

Although there is a growing recognition of the city as a landscape not only for people but also nature and food (Forster & Escudero, 2014), empirical studies of everyday practices that bring this connection are scarce. The gravity of problems arising from rapid urbanisation and environmental changes in the twentieth century often tend to prioritise macro level solutions for sustainability. However, we must also “attend to individual and small-group acts of inhabitation and improvisation that makes places of nature and generate vitality and layers of meaning across places” (Rademacher & Sivaramakrishnan, 2017, p. 9). In this regard, practices, such as urban home gardening, are relevant for ethnographic enquiry. The insights offered in this study set the groundwork for future research on the many meanings of urban gardening in the global south and its potential for creating animistic urban worlds. Besides, “nature has for a long time functioned as the constitutive outside, or other, of much urban social analysis, including urban anthropology” (Stoetzer, 2018, p. 299). By foregrounding nature as agentic and sentient, involved in the process as co-actors and co-creators towards making a healthy urban environment, it adds to emerging more-than-human urban studies. It calls for more such research on the human-nature relations and dimensions of urban gardening. Also, particular histories and socioeconomic contexts of each city may add to a comprehensive picture of urban gardening in India.

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Appendices

List of Garden Plants

SI No	Common name	Local Name	Scientific Name
1	Spinach	Chumanna Cheera	Amaranthus dubius
2	Spinach	Palak cheera	Spinacia oleracea
3	Brinjal	Vazhuthananga (pale green),	Solanum melongena
4	Brinjal	Kathiri (purple)	Solanum trongum Poir
5	Clove Bean	Nithya vazhuthana	Ipomea muricata
6	Chilli	Mulaku	Capsicum frutescens
7	Tomato	Thakkali	Solanum lycopersicum
8	Papaya	Omakka	Carica papaya
9	Curry Leaves	kariveppila	Murraya koenigii
10	Cucumber	Vellarikka	Cucumis sativus
11	Ladies Finger	Vendakka	Abelmoschus esculentus
12	Bitter Gourd	Pavakka	Momordica charantia
13	Cabbage	Cabbage	Brassica oleracea var. capitata
14	Cauliflower	cauliflower	Brassica oleracea var. botrytis
15	Ivy Gourd	Kovakka	Coccinia grandis
16	Drum Stick	murungikka	Moringa oleifera
17	Oyster Mushroom	chippi koon	Pleurotus ostreatus
18	Milky mushroom	paal koon	Calocybe indica
19	Long Bean	Payar	Vigna unguiculata subsp. Sesquipedalis
20	Ash Gourd	Kumbalanga	Benincasa hispida

21	Winged Bean	chatura payar	Psophocarpus tetragonolobus
22	Lemon	Naranga	Citrus limon
23	Giant granadilla	Akasha vellari	Passiflora quadrangularis
24	Tahitian spinach	Cheera Chembu	Xanthosoma Brasiliense
25	Malabar Spinach	Valli cheera	Basella alba
26	Musk okra	Kasthuri venda	Abelmoschus moschatus
27	Snake gourd	Padavalam	Trichosanthes cucumerina
26	Cluster beans	kotha amara	Cyamopsis tetragonoloba

Sl No	Root Vegetables	Local Name	Scientific Name
1	Elephant foot Yam	Chena	Amorphophallus paeoniifolius
2	Tapioca	Kappa/Cheeni	Manihot esculenta
3	Beetroot	Beetroot	Beta vulgaris
4	Arrowroot	Koovam	Maranta arundinacea
5	Air potato	Adathaappu	Dioscorea bulbifera
6	Chinese potato	Koorka	Solenostemon rotundifolius
7	Greater yam	Kaachil	Dioscorea alata

8	Lesser yam	Nana kizhangu	Dioscorea esculenta
9	Carrot	Carrot	Daucus carota

Sl No	Fruits	Local Name	Scientific Name
1	Lady finger Banana	Rasakadali Pazham	Musa acuminata
2	Orange	Orange	Citrus sinensis
3	Grapes	Mundiri	Vitis vinifera
4	Coconut	Thenga	Cocos nucifera
5	Gooseberry	Sheema Nelli	Phyllanthus acidus
6	Jackfruit	Plavu	Artocarpus heterophyllus
7	Indian Plum	Lovlolika	Flacourtia jangomas
8	Guava	Perakka	Psidium guajava
9	Pomegranate	Anar	Punica granatum
10	Sapota	Sapota	Manilkara zapota
11	Custard Apple	Seetha pazham	Annona reticulate
12	Mangoes	Maavu	Mangifera indica
13	Rambutan	Rambutan	Nephelium lappaceum
14	Hog Plum	ambazhanga	Spondias mombin
15	Passion fruit	Passion fruit	Passiflora edulis
16	Dragon fruit	Dragon fruit	Selenicereus undatus
17	Jamun/Indian blackberry	Njaaval	Syzygium cumini

18	Pineapple	Kaitha chakka	Ananas comosus
19	Cherry	Cherry	Prunus cerasus
20	Bonsai mango	Kullan Maavu	Mangifera indica
21	Soursop	Mullaatha	Annona muricata

Sl. No	Medicinal plants Spices and Herbs	Local Name	Scientific Name
1	Paradise Tree	Lakshmi Taru	Simarouba amara
2	Turmeric	manjal	Curcuma longa
3	Mango ginger	Manga inji	Curcuma amada
4	Centipede Plant	Pazhuthara Chedi	Muehlenbeckia platyclade
5	Kiriyathu	Chirita	Swertia chiratta
6	Sweet Flag	Vayambu	Acorus calamus
7	Indian indigo	Neela Amari	Indigofera tinctoria
8	Holy basil	Thulasi	Ocimum tenuiflorum
9	Cinnamon	Karuvapatta	Cinnamomum verum
10	Veld grape	Chengalamperanda	Cissus quadrangularis
11	Black Nightshade	Manathakali	Solanum nigrum
12	Aloe vera	Kattar vazha	Aloe barbadensis miller
13	Pepper	kurumulaku	Piper nigrum
14	Indian sarsaparilla	Naruneendi	Hemidesmus indicus
15	Shatavari	Shatavari	Asparagus racemosus
16	Ginger	Inji	Zingiber officinale
17	Betel	Karpura vetta	Piper betle
18	India Borage	Pani koorka	Coleus aromaticus

19	Malabar nut	Adalodakam	Justicia adathoda
20	Heart-leaved moon seed	Chittamruthu	Tinospora cordifolia
21	Vegetable humming bird	Agathi	Sesbania grandiflora
22	Myrobalan	Karakkai	Terminalia chebula
23	Veldt grape	Pirandai	Cissus quadrangularis
21	Mint	Puthina	Mentha spicata

Sl. No	Flowers	Local Name	Scientific Name
1.	Lotus	Thamara	Nelumbo nucifera
2.	Rose	Rosapoovu	Rosa
3.	Mangolia Alba	Champakam	Magnolia champaca
4.	Hibiscus	Chemparathi	Hibiscus
5.	Oleander	Arali	Nerium oleander
6.	Neem	Vepu	Azadirachta indica
7.	Orchids	Orchids	Orchidaceae
8.	Night-flowering Jasmine	Pavizhamalli	Nyctanthes arbor-tristis
9.	Marigold	Jamanthi	Chrysanthemum
10.	Sunflower	suryakaanthi	Helianthus annuus
11.	African violet	African violet	Streptocarpus ionanthus
12.	Balsam	Balsam	Impatiens balsamina

12.	Venezuela rose	Venezuela rose	Brownea grandiceps
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Phd . Research

University of Hyderabad

House no:

Ward name

1. Name of Household head

Sex

Age

Community

Details of family members

[illegible]

7										
8										
9										
10										

House

- a) Type – Pucca/ Semi pucca/kuccha
- b) Own/ rent
- c) Monthly Expenditure on food, medicine, education

Morbidity

Details of family members suffering from any major illness during last two years : yes/ no

If yes

Sl no	name	age	sex	Nature of disease	Duration	Treatment source first	subsequent

Mortality: Has anyone died in the family during last one year? Yes/ No

If yes

Sl.no	name	Age at death	Sex	Cause of death	Duration of illness suffered

Migration:

Out migration

In migration

Sl no	Person	Place of birth	Place of migration	Distance	Duration	Seasonal/Specify	Reason	
	Grand father/mo							
	Fa/mo							
	Self							
	Son/Da							
	G, son/Da							

Who migrated in the family? How far?

- a) Self b) self and wife c) couple and children d) couple, children and parents

Garden

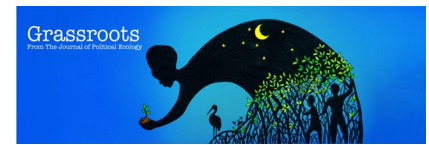
- a) Type of Garden: Back yard/ terrace/ leased in/ leased out
- b) Avg size of garden (cents/acres, sqft)
- c) Year in which started
- d) Plants grown (crops, medicinal)
- e) Livestock
- f) Self consumption/ sale/ both
- g) Income from sale
- h) Markets for sale
- i) Inputs used -seeds, fertilisers, household waste, compost facility, water
- j) Sources of inputs- own, govt, friends, relatives/others
- k) Special equipments or structures installed for garden
- l) Attended/ organised any training for gardening/ organic farming? Yes/ no.
If yes, where, when, how frequently?

- l) Perspectives on organic farming/food vis a vis other food
- m) Reason to take up/ give up (if discontinued)
- n) Advantages of gardening in urban space
- o) Problems or limitations
- p) Suggestion for improvement

Development schemes

Are you aware of the programmes undertaken by govt? Yes/ no

Have you benefitted from any service? Yes/ no/ unsatisfactory



Symmetrical, non-sovereign cartography as a means for conservation: insights from a participatory forest mapping exercise

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Abstract

Studies of participatory mapping consider it to be a grassroots activity that secures customary rights, the sovereignty of marginalized communities, and as a tool for conservation and sustainable resource management. Political ecology sees such grassroots struggles as sites where multiple (human) groups/actors articulate and contest their knowledge of, and control over, entities called 'resources.' However, 'resources' exclude the role of other-than-humans, thereby perpetuating asymmetrical and anthropocentric ways of knowing and conceptualizing place-based struggles. In the quest for distributive justice, the modern principle of sovereignty also goes unchallenged. Through an ethnographic observation of participatory mapping among the indigenous Gonds of Adilabad in South India, this *Grassroots* article shows that by incorporating other-than-human actors as equal agents of conservation, the Gonds have produced a non-sovereign, symmetrical map that challenges notions of human sovereignty over a seemingly inert 'nature.' Grassroots mapping can include other-than-humans, making it a potent exercise in revealing and articulating more-than-human ways of conservation.

Keywords

mapping, sovereignty, rights, conservation, Gonds, other-than-humans, political ecology

1. Introduction

Participatory mapping is one of the most creative grassroots tools for conserving life worlds against destructive anthropogenic practices. Popular discourse on grassroots mapping sees it as a means to negotiate and secure the sovereignty, knowledge, and agency of marginalized humans over their 'natural resources' (see Pearce & Louis, 2008; Bryan, 2011; Rye & Kurniawan, 2017). However, there are two difficulties. First, radical ecologists point out that sovereignty is a modern principle that implies domination by certain humans over nature: "ecological sovereignty" (Smith, 2011, p.11). Sovereignty is a foundational principle of modern nation states, and it strengthens an underlying metaphysical divide between humans as *subjects* and non-human nature as resources and *objects* (Smith, 2011). Using participatory processes to extend this principle across 'non-modern' communities or indigenous groups, whose worlds are not necessarily built on these divisions, is therefore problematic. Second, 'political ontology scholars', particularly from Latin America, have pointed out

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that exploitative and exclusionary anthropogenic practices have affected not only vulnerable human collectives but also other-than-human beings, who are often grouped as 'nature' or as part of supernatural beliefs in popular discourse (de la Cadena & Blaser, 2018). This is often the case because of the difficulty that local people have in demonstrating the "real" (Stengers, 2018, p.101), or equally valuable, existence of these entities in ways that are acceptable to western science. Thus, these researchers are concerned about the possibility of translating the erosion of these more-than-human worlds into a political issue (de la Cadena & Blaser, 2018).

In the social sciences, non-human actants have received increasing attention in anthropological literature (cf. Descola, 2013; Viveiros de Castro, 2005; Tsing, 2014) and Science and Technology Studies (cf. Latour, 2007; Haraway, 1988; Barad, 2003; de la Cadena, 2015), among other disciplines. However, studies in political ecology dealing with conservation ethics have not focused extensively on the agency of nonhumans or the various obligations that humans have towards them (Lorimer, 2012). Referring to this research gap, Little and Reinhardt (2007) argue that the biophysical forces called 'nature' are not simply a backdrop against which social agents perform their part. Thus, they advocate for a heuristic principle of "epistemological symmetry" (Barnes & Bloor, 1982, cited in Little & Reinhardt, 2007). According to this principle, any event or conflict is always the outcome of 'social' and 'natural' forces combined. Hence, political ecology researchers should admit the role of both human and non-human agents while investigating a phenomenon (Little & Reinhardt, 2007).

Responding to this call, this *Grassroots* article considers the practices of grassroots mapping and their potential to render other-than-humans politically visible. It examines the case of a participatory mapping experience among the indigenous Gonds of Adilabad, in South India, carried out in collaboration with an NGO. Through an ethnographic exploration of these mapping practices, the article highlights the role of other-than-humans (such as forest and village deities, ancestral spirits, and grazing animals) in the Gonds' understanding of their territory and in their claims to land. As a result, a more symmetrical conservation goal emerges that does not take for granted human sovereignty over other-than-human actants. In this way, this Grassroots article contributes to an inclusive political ecology that incorporates other-than-humans as active participants in the world, and as central in the grassroots struggle for land and territorial governance.

The article is organized into three sections. The first describes the mapping activity in which other-than-humans enter as agents of conservation on whose behalf the Gonds make claims to land. The second section details the practices through which humans and other-than-humans collectively perform the making and conservation of the Gond world. Finally, the implications of a grassroots mapping characterized (in this case among the Gonds) by epistemological symmetry and by an ethics of non-sovereignty are raised for political ecology and conservation.

2. Mapping the agents of conservation

In India, colonial and early post-colonial forest policies, with their top-down approach and a focus on commercial and conservationist interests, excluded the rights and relations of indigenous people to their forests (Reddy *et al.*, 2005). However, the latest legislation in the form of the Forest Rights Act, 2006 (FRA) provides the *gram sabha* (village assembly at the grassroots level) with the power to pass resolutions and recommend claims (individual as well as community forest rights), which are then recognized by higher authorities. However, some analysts have pointed out that this Act is poorly implemented, and that this is due to the lack of actual mapping and estimation of the extent of forestland, which is often located outside village boundaries (Trinadharao, 2016). Moreover, there is inadequate institutional support from State forest departments to map and assess these areas, resulting in poor recognition of community rights (Trinadharao, 2016). Meanwhile, under the guise of integration into the national and global market economy, deforestation and conversion of the commons, including grazing lands, into agricultural lands are rampant in these areas. In such a scenario, indigenous people often partner with non-governmental organizations in participatory mapping activities.

The mapping

During the winter of 2015, I was among the *Gond* people in Gadiguda village, located in the northern part of the South Indian state of Telangana. Two individuals, L. Rao and A. Rao addressed the *Gram Sabha*

(village assembly) that gathered on the premises of a local school about the need to map the Gond's territory. L. Rao was the community representative and volunteer with a local NGO, while A. Rao was a member of the Forest Rights Committee constituted under Forest Rights Act 2006. L. Rao mentioned the fact that there were no definite boundaries or demarcations of the Gond's territory, especially for their grazing lands. This lack of clarity had led some individuals to expand their fields into those areas. As a result, the land available for grazing has gradually decreased, making it difficult for the community to maintain their herds. In addition to addressing these issues, he explained that the mapping exercise would support the Gond's request for a common *patta* over such lands (legal record of collective ownership), from the government and the forest department. "It would be for the benefit of the community", said the village *Sarpanch* (chairperson) of the *Panchayat* (local self-government). Thus, attendants to the meeting began chalking out on the ground a map of the area to be requested under various communal rights (see Figure 1).



Figure 1: Participatory mapping in progress. Source: Author (Dec 2015), Fieldwork

The community members first drew a square post with a flag denoting the seat of *Aakadi pen* (the god of hills and forests). It helped them decide the boundary separating the village from the forest and hills. The seat of *Aakadi pen* and the areas adjacent to it became the foothills, and the areas to the north were marked as forests and hills, while agricultural fields and hamlets were marked to the south. They said that *Aakadi pen* controls forests and guards the herd boys and the cattle that venture into it for grazing. As the Gond have collective obligations towards this god, the place of *Aakadi pen* had to be protected and claimed under community *patta*. Within the area identified as forest, they mapped the following six areas: VSS areas (under the control of forest department and conservancy laws, NTFP (non-timber forest products) areas, *Aayurvedi*

(medicinal) plants, bamboo growing areas, community burial grounds, and grazing lands. Across the foothills they marked IFR (individual forest rights) lands. To the south of the *Aakadi pen*, they began mapping their villages amidst vast agricultural lands (marked as revenue lands). Each village was represented by a collection of houses arranged in rows next to the seat of *Auvval pen* (village mother goddess). L. Rao said that just as the *Aakadi pen* guards the forest, each village has its own guardian god, called *Aki pen*, and its own village mother, called *Auvval pen*. He added that the community as a whole has ritual obligations to both of these deities, be it seasonal rites during festivals or at times of disasters. Finally, they marked grazing pathways, roads, and streams. Figure 2 shows the resulting map of the Shivrara forest village, which comes under Gadiguda Gram Panchayat.



Figure 2: Map of Shivrara forest village on paper. Source: L Rao (Dec 2015), Fieldwork.

Forests and hills occupy a meager portion of the land shown on the upper section of the map (Figure 2). In contrast, the revenue/agricultural lands (marked as rectangular plots) occupy the lion's share. This is evidence of rampant deforestation and conversion of grasslands for the cultivation of high-yielding crops such as cotton and soya. The main road runs across the middle of the village separating it in two parts, Shivrara A

and B. The places controlled by territorial deities are marked in squared posts with flags. The arrows indicate grazing pathways spread across the whole area in all directions. The dotted lines indicate streams into which the perennial river branches out.

After the mapping exercise was over, the elders and *Sarpanch* had discussions with the NGO workers and made decisions about the amount of land that the community would require for various purposes. They decided to request 100 acres (40.5 ha) for grazing, 200 acres (81 ha) for bamboo, 2 acres (0.8 ha) for the building of a temple for *Aakadi Pen* (the forest deity), 15 acres (6.1 ha) for medicinal plants, 10 acres for community burial grounds, 10 acres (4.4 ha) for *Auvval Pen* (the village mother deity) and 30 acres (12 ha) for non-timber forest produce (NTFP). A formal application for these lands would be forwarded to the VRO (Village Revenue Officer) and the Beat Officer. With the *Sarpanch*, they decided on the matter in subsequent meetings.

Although operating within a rights-based framework that privileges human agency and sovereignty over non-human resources, here the indigenous Gond people have de-centered themselves as humans and waived their ecological sovereignty when it comes to conservation. Their map is not an expression of collective ownership 'rights' of humans over non-human resources. Rather, they are restating their 'duties' towards other-than-human agents that conserve and make the world of Gonds. Much like a story or folklore, this map articulates a more-than-human world and expresses the interest of the Gond in securing the rights and localities of the other-than-humans on whose behalf they make territorial claims. However, as Blaser (2009) puts it, "though stories are a good entry point to an ontology... (We) must attend to the ways in which those stories are embodied or enacted" (Blaser, 2009: 877), to which we now turn.

3. Performing conservation with other-than-humans

It is not difficult to understand why the community claimed 100 acres (40.5 ha) of land for grazing during the mapping exercise; the Gond economy is based on agriculture and animal husbandry. However, understanding why the community claimed 200 acres (81 ha) for bamboo cultivation is not as straightforward. The reasons behind this choice become clearer when we consider that bamboo is not merely a plant for the Gond. Each month in the Gondi calendar is dedicated to the worship of one or more of the Gond's traditional clan and local deities known as *pen*, as well as some gods and goddesses of the 'Hindu' pantheon. In the world of Gonds, the living, the dead, and their gods all have a social life. Though *jiv* (the life force) leaves the body of humans when they die, the personality of the dead (*sanal*) continues to linger near their burial fields and wander in the forests (von Furer-Haimendorf, 1979). *Persa pen* is the supreme clan deity in whose company the dead ancestors of Gonds continue to protect their living clansmen. Each *saga* (exogamous patrilineal descent groups) has its own *Persapen*, and each *Persapen* is represented by an iron spearhead and a whisk made of a cow's tail. These objects are fixed on a bamboo shaft whose nodes stand for the number of lineages in that clan. Thus, in this context, the bamboo is no longer merely 'natural'; instead, bamboo sticks become "social objects assembled through and involved in co-fabrication of socio-material worlds." (Whatmore, 2006, p.604). Since these objects are symbols of clan's gods, they inspire awe and invoke unity among lineage members across different villages.

A typical Gond village is not only a geographical unit but "a ritual and social unit that persists as long as there is the continued occupation of the land and collective performance of rites to the guardians and mother deities of the village" (von Furer-Haimendorf, 1979, p.42). It is therefore natural that these rituals require their own space and that they affect the mapping exercise. For example, the focal points of Gond rites (sowing, harvest, marriages, and also dealing with disasters and epidemics) are the teakwood post of *aki pen* (the village guardian god) and the sanctuary of the mother goddess *auvval pen*, for whom the community claimed 10 acres (4 ha) of land. In addition to the village mother, there are several other female deities in the Gond's world that are referred to as *auvval*. For instance, *siwa auvval* is the boundary goddess who brings diseases to the village in the rainy season. During the month of *pola* (July-August), the community performs a ritual to banish her from the village (von Furer-Haimendorf, 1979). Maintaining a good relationship with the village mother and healing practices using *Ayurvedi* (medicinal) herbs by practitioners (*bhaktal*) serve as prevention and remedial

measures. Thus, in addition to the 10 acres of land for the village mother, the community also claimed 15 acres (6 ha) of land for medicinal plants.

Another important deity mapped by the Gonds was the *aakadi pen*/forest spirit, for whom the community claimed 2 acres (0.8 ha) of land. *Aakadi* in Gondi language refers to the rainy month of June-July. The forest becomes lush, and cattle and herders who venture for grazing are vulnerable to its affective power in terms of attacks from snakes and scorpions, among others. A few days before the full moon, the *aakadi* rites are performed. Known as the *Daturi* ritual, it is a re-enactment of sending off cattle into the forest and securing their safe return. For this ritual, the herd boys, cattle, and older men gather before the *aakadi pen*. The deity is symbolized by a stone located at the bottom of a tree on the path that leads from the village to the forest. After the sacrifice of goats and chickens, the *dewari* (the village priest) draws a ritual line using turmeric powder from the sacrificial stone of *aakadi pen* up to the foothill. Herd boys then drive the cattle across this line accompanied by cheering and blowing of horns. This activity is a message to the dangers lurking in the forest to flee (von Furer-Haimendorf, 1979).

The mapping exercise reveals that Gond villages are populated by other-than-human beings (forest and village deities, the dead, cattle, bamboo, medicinal plants, and animals) that constitute the Gond's 'social' life and that actively affect the world that they cohabitate with humans in different ways (providing guardianship, inflicting harm and healing, hovering, wandering around, and so on). Thus, the conservation and sustenance of a world emerge as a collective performance enacted not by humans 'over' other- than-humans, but collectively by humans 'and' other-than humans.

4. Conclusion

Political ecology incorporates approaches from various disciplines (across the social and natural sciences) to understand human-environment relations and eco-social conflicts among various groups. To that extent, it is "epistemologically plural" (Tetreault, 2017, p.1). However, it is not yet "epistemologically symmetrical" (Little & Reinhardt, 2007) in the sense that it has not yet found ways to incorporate other-than-humans as active participants in conservation politics. This article is a response to such a call for symmetry. The indigenous Gonds of Adilabad have tried through their mapping exercise to "make public" (de la Cadena & Blaser, 2018) other-than-human agents involved in the politics of conservation. By acting as social agents and as beings who perform conservation with humans in various capacities, these other-than-humans invite political ecologists to rethink the notion of other-than-humans as beliefs, natural resources or backdrops, differential access, and use of which causes conflicts among human social groups.

Moreover, an approach that looks at participatory mapping as a means to secure and articulate the sovereignty of powerless people over their ecology, fails to question the very idea of sovereignty as a modernist ethical principle. Instead, ethnographic encounters with grassroots initiatives, especially participatory grassroots mapping, show that the role of other-than-humans is central to local communities' conservation practices and land claims. For instance, this article showed that for the Gonds, the *akadi pen* (the forest spirit) guards their cattle and herders. The seat of the *akadi pen* in the form of a stone at the bottom of a tree enables the Gond to determine where forests begin and where they end. The stone sanctuary of *avval pen* (village mother) marks the boundaries of their village. All the non-human entities (forest and village spirits, grazing animals, the spirits of the dead, medicinal herbs, bamboo) on whose behalf claims were made, help humans conserve the Gond territory. Their roles range from guarding the village and forests, forging lineage unity among humans, healing, hovering, and becoming unruly at times. By mapping these beings, Gonds are advocating a politics based on an ethics of non-ecological sovereignty. The naming of deities and spirits in this map indicates that the Gond indigenous people acknowledge that they are not sovereign with respect to the ecology of their territories. There are other actors responsible for the existence of life and whose inclusion as agents of conservation and sustenance is equally important. The more-than-human map of the Gonds shows that sustainable resource management can adopt a symmetrical and non-sovereign ecological framework as the organizing principles of conservation and sustainability.

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This is to certify that **Ms. Gomathy K N** participated in the Indian Anthropology Congress – 2019 and presented the following papers

1. Urban agriculture: Need and prospects of ethnographic studies of urban roof top farming

Abstracts of the papers along with other session information was published in the Abstract book that was distributed to all the participants.

Ms. K N's participation in the congress is much appreciated.

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This is to certify that **Ms Gomathy KN** presented a paper titled **Where Pleasure Meets Precarity: Reflections from Ethnographic Study of Urban Home Gardening** at the Young Scholars' Conference 'Exploring New Research Frontiers in Social Sciences' organised online by the Society for Social and Economic Research, New Delhi on January 15 - 16, 2022. The presentation was also selected for the best presentation award at the conference.

Jesim Pais
Director



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Co-creating Animistic Care World in Precarious Times: An Ethnographic Study of Urban Rooftop Gardening in Thiruvananthapuram city, Kerala

by Gomathy K N

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