

Sri Lankan Home Gardens and Household Food Security



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1. Home Garden Invention

The basic concept of home garden system arose thousand years ago. At that time, it was called as agro-forestry in Sri Lanka. Most of the living places abundantly found home gardens in each district. But very famous home garden system in the central region was called “Kandyan Home Gardens (KHG)”. The areas of these KHGs were limited to Kandy, Mathale and Kurunegala districts. Home garden in any pace may be either a traditional or cultivated home garden.

Traditional home gardens are,

- closely related to geographic location, cultural backgrounds and socioeconomic conditions of their owners.
- ideal forms of land use (combines agriculture, forestry and livestock).
- trees are grown in a multi-tiered arrangement.
- terraced areas planted according to local topography and soil conditions.
- traditional practice of mixed cropping of trees yielding timber, small wood, fuel wood, fodder, fruits, spices, nuts, medicines and other cash crops.
- entire system provides an ideal healthy microclimate for both man and animals.

Home garden consists of annual, biennial and perennial crops including livestock production. Plants with different canopy depths are located in these home gardens and then known as multi- specied and multi-storied cropping system. The synonyms are, mixed garden, compound farm, kitchen garden, household home garden, home garden agro forestry system. The basic structures of the home garden varied from place to place, based on their ecological, socio- economic and cultural factors.

Generally home gardening practiced in a small piece of land which is close to the family residence. The cultivated materials which are usually added to the daily nutrient supplements of the family members. And also, home gardening, is a mixed cropping system of various types of vegetables, fruits, plantation crops, herbs, spices, ornamental plants and medicinal plants, parallel to livestock production. Home garden is a kind of organic farming technique to cooperate with the food safety. Research found reported that, it is a multi-storied combination of various type of trees and crops, compiled with domestic animals, nearby residences and cultivated fully or partially for domestic consumption.

Definition of Home Gardens

There are various definitions for the home gardens.

1. The home gardens or household garden is a small-scale production system supplying plant and animal consumption and utilitarian items either not obtainable, affordable, or readily available through retail markets, field cultivation, hunting, gathering, fishing, and wage earning. Household gardens tend to be located close to dwelling for security, convenience, and special care. They occupy land marginal to field production and labor marginal to major household economic activities. Featuring ecologically adapted and complementary species, household gardens are marked by low capital input and simple technology (Ninez,1984).
2. Home garden is an area of land, individually owned, surrounding a house and usually planted with a mixture of perennials and annuals (TERRA, 1954)
3. A plot of land that has a residence on it, fixed boundaries and a functional relationship with its occupants is called as a home garden (Second Home garden Seminar Indonesia, 1978)

4. A subsystem within larger food procurement systems which aims to produce household consumption items, either not obtainable through permanent shifting agriculture, hunting, gathering, fishing, livestock, husbandry or wage earners. (Anonymous)
5. A home garden is defined as a supplementary food production system that is under the management and control of household members. A household garden can be consumption-or market-oriented, but at least some of the produce will be consumed by the household. As a supplementary production system, the household garden is secondary to both the primary source of household food, whether from field production or purchase and to household income, whether from sales of field produce, wage labour or other sources (Soleri, Cleaveland and Frankenberger, 1991).
6. Home garden covers the production of vegetable for family use. It is an important but inexperienced way of providing a continuous supply of fresh vegetables for family table. Yields from the home garden contribute to the family nutrition and may even provide additional income (Soriano and Villareal, 1969).
7. Home garden is a land use with definite boundaries and a house, which is usually (but not always) a mixture of annual, perennial plants and animals and serves as variety of biophysical, economics and sociocultural functions for the owner (Soemarwoto and Soemarwoto, 1985)
8. Home gardens is a small area where vegetable-growing is being done. In this type of garden, planting is done regularly. Its primary purpose is to provide a

continuous supply of nutritious but cheap good quality vegetables for home use. In certain cases, it also provides an extra income when excess vegetables are sold. (Aycardo, and Creencia, 1981)

9. Home garden refers to garden within the household perimeter, including the garden located out in the field, the produce of which is normally intended for household consumption. (Eusebio,1988)
- 10.Home garden is an area within the home lot or elsewhere cultivated for home consumption. (Torres, 1988)
- 11.A piece of ground usually adjoining a dwelling where vegetables, fruits and ornamentals are cultivated is called as home garden (Javier, 1988).

Table 01: Key characteristics of a typical home garden

Characteristics	General practices
Species density	High
Species type	Staples, vegetables, fruits, medicinal plants
Production objective	Home conception
Labor source	Family
Labor requirement	Part time
Harvest frequency	Daily, Seasonal
Space utilization	Horizontal and vertical
Location	Near dwelling
Cropping pattern	Irregular and row
Technology	Simple hand tools
Input cost	Low
Distribution	Rural and urban areas
Skills	Gardening and horticultural skills
Assistance	None or minor

3. Classification of Home Gardens

There are many systems of classification of home gardens, but no globally accepted current scheme. There are two segments under the ecological classification based on the climatic and the soil characteristic of the country.

1. Tropical home gardens – localized in Central and South America
2. Temperate

Each marked by particular features in terms of structure and species composition. Tropical home gardens tend to have complex vertical structures and many species with many life-forms. In temperate home gardens, it has simple vertical structures with all the plants unshaded and dominated by annual species.

An alternative way of classifying traditional home gardens according to their contributions to household economies.

1. Subsistence
2. Budget gardens.

Earlier people who mainly forced on providing households food, fruit and other daily produce, for the family consumption and latter mainly to providing financial income.

Home gardens can also be classified as formal and informal home gardens.

1. Formal Home Gardens
 - The formal gardens are geometrically symmetric and obviously imposed on the landscape by man.

- They are characterized by straight lines, by regular curves and by symmetrical balance.
- Many of the plants used are likely to be highly developed products of plant breeder's choice e.g., hybrid roses and the plants may be trained to artificial shapes to form strictly sheared hedges, archways and espaliers. Many of the plants are exotic origin.
- Accessories to formal garden, such as masonry features, paving, seats, fountains, statues, and the lake should be sophisticated.
- Scrupulous neatness and tidiness are needed to maintain a formal garden.

2. Informal Gardens

- Informal gardens are asymmetric and naturalistic.
- An impression is obtained in such a garden that here man has not relentlessly imposed his wishes.
- Asymmetric balance and irregular curves of natural appearance are its characters.
- The plants used will be to a large extent of native origin, but in some cases exotic plants can also be carefully included in such gardens.

- The plants shall not always be pruned to artificial shapes. Trees and shrubs that fit well into the local natural landscape should predominate

Some scientists have classified home gardening as;

1. Forest Gardening:

- It is with low maintained sustainable plant-based food production and agroforestry system based on wood land ecosystems
- Incorporated fruit and nut trees, shrubs, herbs, vines and perennial vegetables which have yields directly useful to humans are there
- Making use of companion planting is there. These plants can be intermixed to grow in a succession of layers, to build a woodland habitat
- Kandyan forest garden in Sri Lanka is one of the examples for forest garden.

2. Kitchen Gardening

- It is a space separate from the rest of the residential garden –the ornamental plants and lawn areas
- Most vegetable gardens are still miniature versions of old family farm plots, but the kitchen garden is different not only in its history, but also its design
- It is a source of herbs, vegetables and fruits, but it is often also a structured garden space with a design based on repetitive geometric patterns

3. Dry zone home gardening

- Consist of an assemblage of plants, which may include trees, shrubs, vines, and herbaceous plants, growing in or adjacent to a homestead or home compound
- Generally low in tree density and also hold lower carbon stocks than the wet zone home gardens

- Species diversity is reported to be very high due to species having different life forms, height and canopy structure

Another type of classification of home gardens is as follows. It is based on the usage of it and its recreational value.

1. Vegetable Gardens

This garden is common gardens in houses. These gardens have lot of benefits to them aside from simple aesthetic appeal.

2. Flower Gardens

Flower gardens are another type of garden that is really common. Almost everyone on the planet is able to appreciate the fact that flowers are quite beautiful. Having a really nice flower garden on home garden is going to add a significant amount of aesthetic appeal to yard.

3. Herb Gardens

In this garden different types of medicinal plants are cultivated.

4. Raised Gardens

Raised gardens are very important for people who live in areas that don't have fertile soil. There are ways that we can prepare our soil and enrich it so that we can make use of it. Building a raised garden is going to give us the space that we need in order to create a garden area. We will build a platform that will rest on top of the normal soil in our yard.

5. Indoor Gardens

People who live in places that have heavy snowfall often need to turn to indoor gardening in order to get their fix.

6. Container Gardens

Container gardens are really convenient for people who don't have the space to plant more traditional garden areas. These containers can be flower pots, tubs, totes, barrels, and many other types of containers. Proper amounts of soil are put inside of the container and then the planting is started.

4. Benefits of Home Gardening

Home gardens give more benefits for gardeners. It can be categorized in to social, economic and environmental benefits.

4.1. Social Benefits

Sale of products of home gardens significantly improves the family's financial status. Mostly home gardening is subsistence level of farming method and fulfill the daily meal of a family. If it farming with cash crops those are sell including vegetables, fruits, animal products, wood and timber as fuel and construction materials. Research papers stated that, home garden practiced in Nigeria increase the family income by 60% and in Russia, rural home garden with sustainable farming increases their income by two third. A study of urban home gardens in the Philippines revealed that home gardening families spend less on food than non-gardening families, while home gardening families who plant a larger number of varieties of fruits and vegetables spend even less spending on their food purchasing.

Some of the social benefits of the home gardens are elaborated below.

1. Improving health

Plants are an important source of medicine for humans and livestock and are used as biological pesticides to protect crop from diseases and pest infestations. Herbs and medicinal plants are grown in home gardens all over the world. People use herbal and medicinal plant to treat various illnesses, diseases and also to improve their health conditions.

2. Enhancing food and nutritional security

The most fundamental social benefit of home gardens stems from its direct contributions to household food security by increasing availability, accessibility and utilization of food products. Home gardens are maintained for easy access to fresh plant and animal food sources in both rural and urban locales. Food items from home gardens add substantially to the family energy and nutritive requirements on a continuous basis.

3. Social equity and gender balance

In many cultures, women play an important role in food production and are active participants in home gardening activities. While women's contribution to household food production is immense, it is incorrect to conclude that home gardening is a predominantly a female activity. Women's participation in home gardening varies across cultures ranging from land preparation, planting, weeding, harvesting, and marketing.

4. Preserving indigenous knowledge and building integrated societies

Home gardens consist of a variety of species that represent social and cultural aspects of the different societies. There is a rich indigenous knowledge base in communities around the world that is valuable and expressed in home gardens through the selection of plants and animal species as well as in farming practices used by the local community. Home gardens can serve as a repository for preserving and transferring indigenous crop and livestock production knowledge and the skills from generation to generations.

4.2. Economic Benefits

Due to the product from the garden, their self-sufficiency is improved and the earnings from excess can be used to purchase other items than daily food needs. Home gardens contribute to a cohesive social environment, improve the house hold status and their wealth.

Some of the economic benefits of the home gardens are elaborated below.

1. Income generation and improved livelihood

Income generated from the sale of home gardens fruits, vegetables, and livestock products allowed households to use the proceeds to purchase additional food items as well as for savings, education, and other.

2. Improved household economic welfare

Home gardens products may be sold to earn additional income. Gardening activities can be developed into a small cottage industry. Furthermore, the direct earnings from the sale of home garden products and the savings from consuming home-grown food products can lead to more disposal income that can be used for other domestic purposes.

4.3. Environmental Benefits

Home garden is a multi-cropping system and also it is a kind of integrated farming system due to crop farming and animal husbandry both are simultaneously practiced in a same land area. Recycling of nutrients is happening in soil. Solar energy is converted into the photosynthetic energy to produce food which is consumed by both animals and humans. Recycling helps to reduce soil erosion and making the crop canopy layer reducing the velocity of water falling to the soil and reducing split erosion and leaching.

Higher number of species are present in-home gardens. It provides habitats differ fauna facilitation higher biodiversity and controlling pest and diseases as well as the weeds. Different canopy layers control the light transmission and help to natural weed control.

Most of the traditional and local varieties are cultivated in home gardens and they are naturally resistant to pests and diseases. Some insects, reptiles and birds act as natural enemies in the traditional crop bases home gardens. Home gardens helps in solving sanitation issue in the country. In urban cities, town level shops and flat houses facing major problem is the disposing of their garbage. Instead of burning of the disposed kitchen wastes and degradable materials, they can be used for composing in urban home gardens. It reduces the waste issue, improves the ecological diversity and improves the food diversity for home garden families.

Soil conditioning and soil conservation is another advantage in home gardening. Even if the soil profile has disturbed with the incorrect practices, continuous practices of home gardening improve the soil structure and become infertile soil to the fertile soil. Sustainable practices regard to the crop production improve the soil biota and improve the biotic agents which help to improve the soil health. Mulching, soil covering, soil protection practices, organic manuring helps to recycle of nutrition and conserve the soil properties. Though mulching by crop residues and green manures persist the weed growth in home gardens, it reduces the risk due to the soil erosion.

Home gardens provide a number of ecosystem services such as habitats for wildlife and beneficial organisms, nutrient recycling, reduced soil erosion, and enhanced pollination. The high density of plants within the home garden provide ideal habitats and refugia for wildlife species such as birds, small mammals, reptiles, and insects.

5. Factors Considering Composition and Structure of a Home Garden

There are several factors which determined the type of home garden in the particular climatic zone. Mainly it depends on the environmental, geographic, tree composition, socio-economic condition and based on the cultural practices in the field level.

Factor	Condition	Examples and remarks
Environmental condition	Agro-ecological region; Soil parameters	Wet zone home gardens are diverse, dense and structurally more complex than that to Dry zone home gardens; Low soil fertility reduces diversity of crops and density of vegetation.
Geographic location	Urban vs rural; Adjacent to and away from natural forests	Urban home gardens often smaller and more aesthetically oriented; home garden adjacent to natural forests may consist of more endemic species.
Dominant trees or crops	Annual, perennial nature of dominant crop; Density of species; Degree of complementarity to open field cultivation; Level of dynamism; Level of stratification; Presence or absence of animal components	Coconut based, spice crop based, tea-based home gardens; Presence of animal component and crop components; Incipient gardens first dominated by annual crops followed by increased incorporation of tree crops; Stratification based on common forest type of the area.
Socioeconomic condition of households	Size of home garden; Wealth status of owner; Access to market; Access to off-farm	Smaller size more species per unit area included to achieve various food items; With increase of wealth increased importance

	employment; Gender related issues; Contribution to household economy	of commercial and aesthetic plants; Commercial crops stimulated by good market access; Financially lucrative employment decreased importance of commercial crops; Gardens of female headed households often more household use oriented.
Maturity of home garden	Age of home garden mature home gardens are	Structurally more complex than recently established gardens.
Cultural factors	Food preferences of owner or community	Cultural preferences in respect to consumption of vegetables and spices.

Source: Modified from Wiersum (2006).

6. Distribution of Home Gardens in Sri Lanka

Home gardens are distributed in all over the country. But some of the district play significant role in the distribution of home gardens.

- Uva province people are largely engage in home garden than the other areas.
- Least recorded home gardens are found in Eastern province
- Northern, central north, western, southern province have considerable number of home gardens.

6.1 Dry Zone Home Gardens

Depending on the availability of moisture, the crops grown in home gardens in the dry zone are different. Coconut, mango, jack, papaya, orange and guava are amongst the most common species found. Indigenous species including *Halmilla*, Sandalwood, Teak, Tamarind, and Margosa form substantial private planting in farmlands. Soil fertility is high but water scarcity is major problem in dry zone home gardens.

Dry zone home gardens have special characteristics,

- Average home garden size 0.5ha – 1.0ha
- Species composition is low
- Water scarcity is major problem
- Soil fertility is high
- Not very sloppy lands
- More crop varieties grown in the field. High crop diversity.



Figure 02: General look of dry zone home garden

6.1.1. Home Gardens in Jaffna

Jaffna is one of the five districts of the Northern Province in Sri Lanka. The majority of the people residing in this part of the country are of Tamil ancestry. Jaffna Peninsula falls under the dry zone low country with a total annual rainfall of about 635-1400mm (approximately 25 – 50 inches).

Characteristics of Home Gardens in Jaffna

The average size of the gardens was found to be 0.4 acres. Most home gardens contain food crops that are primarily cultivated for household consumption and use while the

excess produce was intended to be shared or sold (Figure 03). Both men and women provide labor for home garden activities and more than two thirds of the households cared for their gardens on a daily basis. Nearly every household had access to simple traditional gardening tools including a hoe (*Mamotty*), a machete, and a steel bar (*Alawangu*).

Live-fenced agroforestry was practiced in 60% of home gardens in Jaffna Peninsula. Farmers need poles to make fences and provide the support for field crops especially for tuber crops, beans, grapes, passion fruit and betel. Most of these requirements are produced from live fences. Due to this reason, most of the home gardens in Jaffna Peninsula maintain the live fences instead of building of concrete walls.



Figure 03: Jaffna home gardens

Commiphora caudata (Wight & Arn.) Engl. was the dominant tree speciesn (Figure 04) followed by *Thespesia populnea* (L.) Sol. ex Correa (Figure 05) and *Delonix elata* (L.) Gamble in live fences in Jaffna peninsula. Twenty-three minor tree species were also recorded from live fences of Jaffna Peninsula. They were identified as *Annona squamosa* L., *Areca catechu* L., *Artocarpus heterophyllus* Lam., *Azadirachta indica* A.Juss., *Commiphora berryi* (Arn.) Engl., *Borassus flabellifer* L., *Carica papaya* L., *Cocos nucifera* L., *Erythrina indica* Lam., *Hibiscus rosasinensis* L., *Lanea grandis* (Dennst.) Engl., *Lantana camara* L., *Limonia acidissima* L., *Mangifera indica* L., *Manihot esculenta*

Crantz., *Phoenix sylvestris* (L.) Roxb., *Psidium guajava* L., *Ricinus communis* L., *Syzygium cumini* (L.) Skeels., *Tabernaemontana divaricata* R.Br. Ex Roem. & Schult., *Tamarindus indica* L., *Tectona grandis* L. and *Thevetia peruviana* (Pers). K Shum. In addition, *Cardiospermum halicacabum* L., *Cephalandra indica* (L.) Voigt., *Cissus quadrangularis* L., *Luffa acutangula* (L.) Roxb., *Momordica diocia* Roxb., *Mukia maderaspatana* (Linn.) M. Roemer, *Passiflora foetida* L., *Piper betle* L., *Piper mullesua* L. and *Solanum trilobatum* L. were identified as liana or climbing species in live fences (Jayavanan, k., *et al.*, 2014).



Figure 04: *Commiphora caudata*



Figure 05: *Thespesia populnea*

6.2. Wet Zone Home Gardens

Wet zone home gardens are located in wet region of the country and its structure is different from dry zone home gardens (Figure 06).

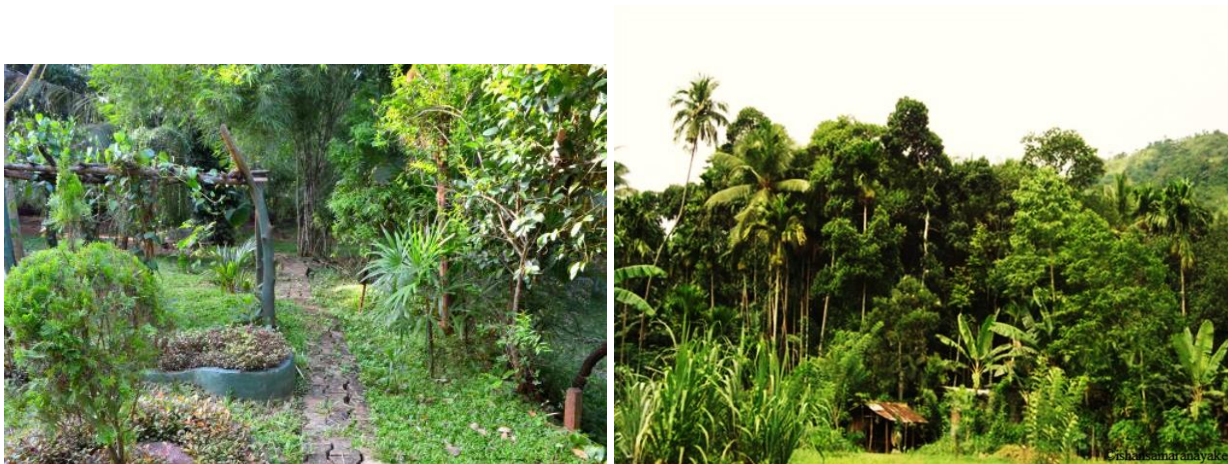


Figure 06: Wet zone home garden structure

- Average home garden size is 0.25ha which is numerically lower value than dry zone home gardens.
- Crop diversity is very high than dry zone home gardens
- Soil fertility is very low due to sloppy condition and soil nutrition loss due to leaching losses.

- Perennial crops are more common than vegetable crops
- Very high sloppy lands.

6.2.1. Kandyan Forest Garden/Home Gardens

Kandyan home gardens are a prominent type of wet zone home gardens. They are Located in Kandy, Matale, Kegalle and Rathnapura, Kurunegala districts of Sri Lanka (Figure 07). Intermediate rainfall zone (mean annual rainfall of 1875-2000mm) and in mid-elevations (450-1050m) with hilly terrains. The KFG system is practiced on a variety of soil types with predominance in strongly to weakly lateritic soils. Out of total area 20% consist of Kandyan home gardens in Kandy district.

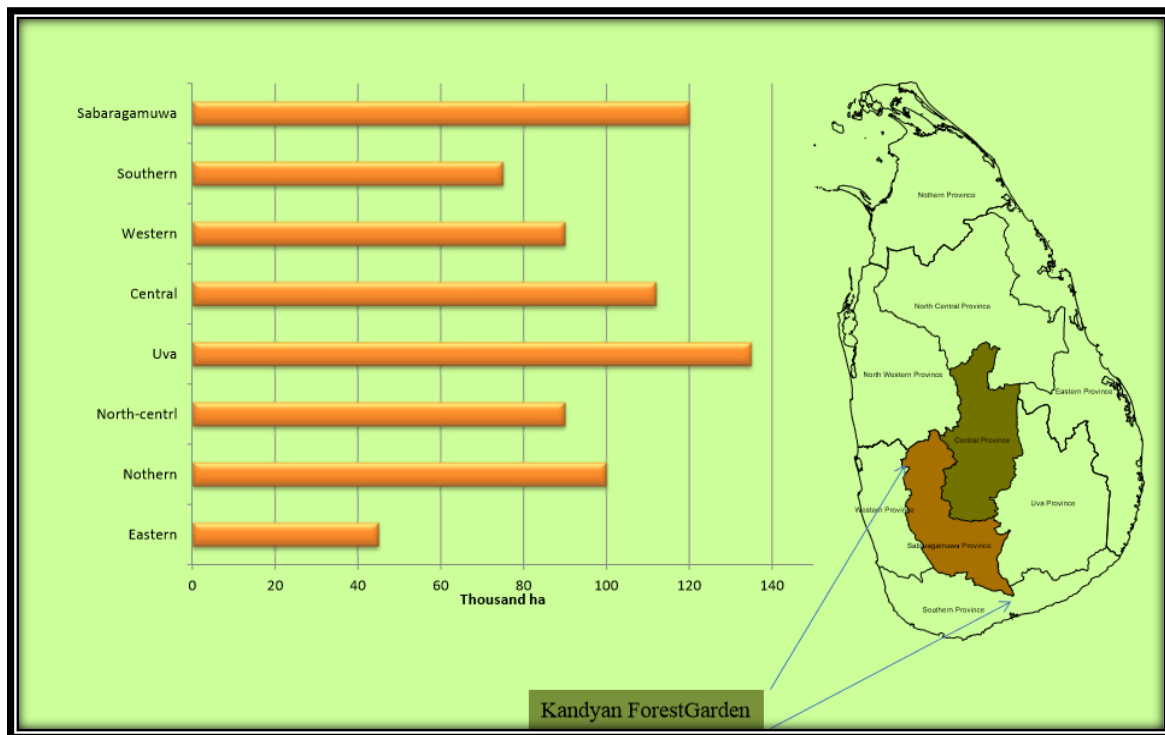


Figure 07: Distribution of Kandyan home gardens in the country

Trees grown abundantly in Kandyan home garden system.

- | | |
|--------------|--|
| Major spices | - Curry leaves, Black pepper, White paper, Turmeric, Clove, Cinnamon, Cardamom, Nutmeg, Vanilla, Ginger, Coffee, Cocoa |
| Woody trees | - Tea, Kithul, Mahogany |
| Vegetables | - Most types including yams |
| Fruit trees | - Jackfruit, Durian, Rambutan, Avocado, Bread fruit, Pineapple, Mango, Passion fruit |

Features of Kandyan home garden,

- Almost same as tropical Rain Forest structure
- Primarily based perennial, semi-perennial and shrubs.
- Tree height is around 30m to 35m
- Many canopy layers called strata. Most five canopy layers can be seen (Figure 8)
- Litter is very thick
- Very low light penetration to the ground layer
- Soil erosion is very low due to thick litter and rain fall intensity through layers is very low.
- Provide many habitats for wild animals
- Free range animal rearing system also found- Cattle and poultry

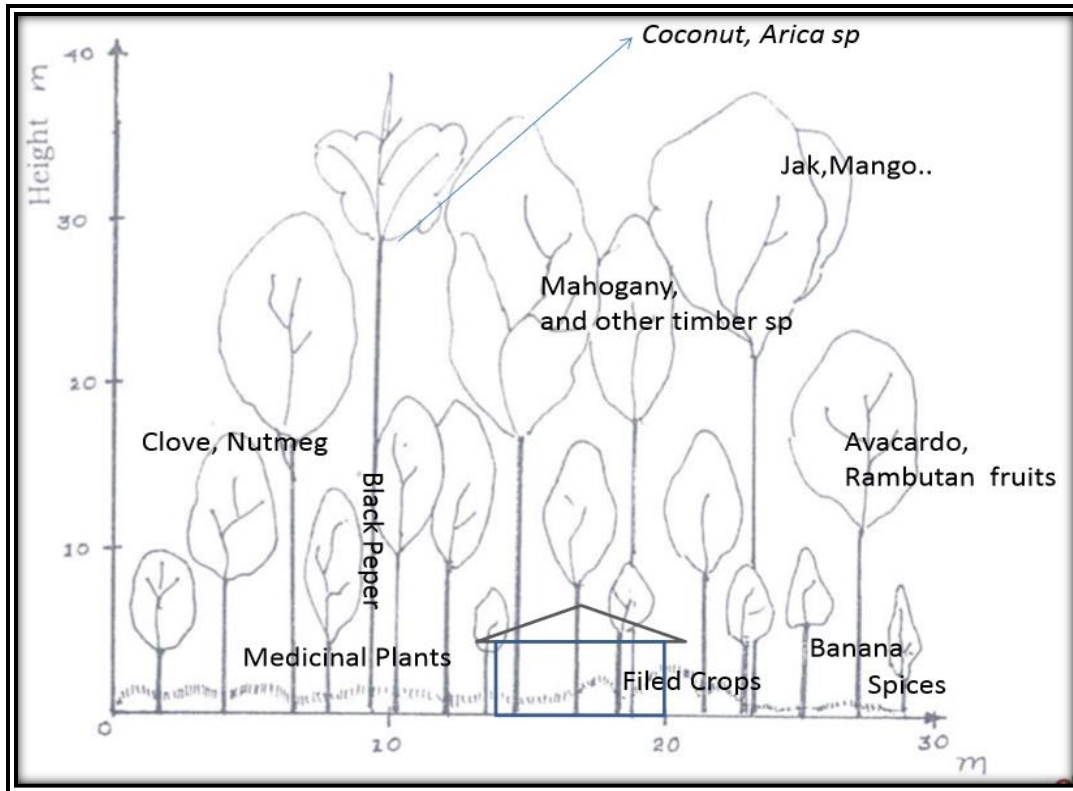


Figure 08: Structure of a typical Kandyan forest garden

Multi-tiered canopy structure is another distinguishing feature of home gardens in the humid tropical lowlands as home gardens consist of a mixture of species whose canopies are arranged in different vertical layers. Several layers of plants occupy the available space both horizontally and vertically and resources are widely used due to its arrangement on different canopy layers.

- All home gardens in Sri Lanka consist of an herbaceous layer near the ground (1-1.5 m height)
- A tree layer at upper canopy levels (approximately over 25 m) and one or more intermediate layers in between depending on the area of occurrence.
- Accordingly, the Wet zone home gardens, particularly Kandyan home gardens are structurally more complex than the Dry zone home gardens.
- As expected, the newly established home gardens are structurally simpler than the well-established mature home gardens.

7. Constraints in Home Gardening and Ways to Overcome

Home gardening has identified constraints as below.

- High competition of weeds with the growing crops
- Insect pests and diseases within cropping season
- Shortage of capital and labor which is also dependent on family members.
- Damages due to adverse weather conditions
- Lack of access to information and extension/advisory services.

Ways to Overcome the Constraints

- Need for timely information for growers, education, and training. However, it has been identified that neighbors and other farmers are the most dominant source of information for home gardening related activities
- Practical aspects courage with home garden management including bee keeping, composting, maintaining nurseries of planting materials, pest and soil management, as well as integrating livestock activities and cultivating mushrooms.

8. Home Gardening and Food Security Relationship

Food security, being one of the Millennium Development Goals, requires a nutritionally adequate and safe food supply at both national and household levels, a reasonable supply of food during the year and in all years, and access by each household to sufficient food to meet the needs of all. Food security has three main facts, namely availability, access and utilization. These are easily completed with the home gardening. Home gardens directly contribute to household food security increasing food availability, accessibility, and utilization.

Home gardens offer great potential for improving household food security and alleviating micronutrient deficiencies. Gardening can enhance food security in several ways, most importantly through:

01. Direct access to a diversity of nutritionally-rich foods,
02. Increased purchasing power from savings on food bills and income from sales of garden products, and
03. Fall-back food provision during seasonal lean periods.

Home gardens are maintained for easy access to fresh plant and animal food sources in both rural and urban locales. Urban home garden systems are little different due to scarcity of land availability. Urban garden can fulfill the same requirement of the family members. Mostly urban families are localized in flats and their day today life activities are arranged into the busy schedule. In flat houses balconies, walls and air spaces used to prepare home gardens into various types and arrangement styles to maximum utilization of the spaces. Poly bags, P.V.C pipes, tiles, racks, bottles, tires, empty buckets used as filling materials (Figure 09). The purpose of the urban home garden is to fulfill the food supplement for their family members and improve the food security level.



Figure 09: Low/ no space gardening strictures in urban areas

Food insecurity has been identified as the prime cause of malnutrition while poverty has been shown to be one of the underlying causes of food insecurity. Presence of any food at any time it completes the food security of the community and minimize the food scarcity. Reduce the mal nutrition and improve the health status of the community through home garden.

Home garden is a multi-farming system of crop farming and animal husbandry. Home gardens provide easy day-to-day access to family nutrition of fresh, healthy and nutritious foods for the household. Home gardeners earn 50% of the vegetables, fruits, tubers, and yams from their garden while increase the calorie supplement through the human nutrition. Human's balanced diet requirement fulfilled with the

significant proportion of protein, vitamins and minerals. Growing spices and herbs improve the palatability and the flavor of the meals. In other global trends move on to the increasing and consumption of vitamin A rich foods through the home garden development programs.



Figure 10: Poultry rearing in home gardens

Animal rearing with home gardening, provide milk, egg and meat from the home raised animals (Figure 10). Instead of that most families engage in beekeeping, fish rearing in small pond and mushroom production as the hobby and that added esthetic value for the gardeners and improve the protein supplement and excess production selling earns money. Foods from home gardens as horticultural crops to roots to palm and animal products. Although home garden crops are not always staple, some

countries like Nepal staple food is yams. Therefore, their requirement fulfilled by their own home gardens.

Home gardens are help to improve the status of farm families by improving the living stands by earning additional income and also improve the nutritive status of the members of the farm family. This concept helps not only for their family but also for broad community level. Typical home garden comprises of food materials, timber, fuel wood, medicine fodder etc.

In Sri Lankan home gardens, total vegetable production reported as leafy vegetables - 60% and other vegetables -20%. Even it taken as the hole consumable materials level it is more than 50% of vegetables, fruits, medicinal plants and herbs. Therefore, home garden concept improves the family nutrition and their food security status. Further medical reports detailed that, home garden families have lower risk for night blindness due to most of home garden vegetables are rich in vitamin A especially dark green leafy vegetables. Therefore, improving consumption it improves the vitamin supplement.

Evidence reported from Java that the 14% of protein requirement is from the home gardens. In Ghana, it produces considerable amount of family income through the meat production from home hardens. In India, combined farming with livestock specially with poultry is common aspect. Home gardens use organic manures, poultry manures, cow done, kitchen waste as the plant nutrient supplement sources. Also, timber materials, woody plants, forestry plants are use as fuel sources.

9. Government Policy Supported in Sri Lankan Home Gardening

Annually, total land area extends year by year for home gardens with the support of government policies. For facing present and future challenges, traditionally developed agroforestry systems innovation and practicing in the village level. National development policy framework of the government, now includes strategies to expand and improve food and timber productions in such landscapes of the country.

9.1. Dairy Farm Villages

The Ministry of Agriculture, Livestock, Land and Irrigation initiated the dairy village development project to develop dairy sector by empowering the dairy farmers. This project aim is increasing the dairy production and promoting the local sales of fresh milk and milk-based products with the assistance of farmer organizations and private sector entrepreneurs. Basic concept is improving socio-economic standards of the farmer, while empowering them for better decision making in their enterprises by improving the production and productivity. 52 dairy villages were established in 2004. It was increased to 174 villages in 2005 (Table 2).

Table 2: Established Dairy Villages in Different Districts

District	Villages	
	2004	2005
N' Eliya	3	6
Badulla	4	4
Kandy	5	12
Matale	3	7
Kegalle	4	9
Ratnapura	1	8
Gampaha	2	5

Kalutara	1	2
Matara	3	6
Galle	-	9
Colombo	-	-
Kurunegala	5	16
Puttalam	2	7
Anuradhapura	4	12
Polonnaruwa	2	3
Moneragala	4	6
Ampara	4	13
Hambantota	3	5
Trincomalee	2	5
Batticaloa	-	10
Vavuniya	-	10
Jaffna	-	4

Source: Ministry of Livestock Development

Table 3 showed Average Milk Production/Day/Farmer/Liters before dairy villages development project. It shows the increase of the milk yield with the project.

Table 03: Average Milk Production/Day/Farmer/Liters before and after the project

District	Before DVDP			After DVDP		
	Cow	Buffalo	Total	Cow	Buffalo	Total
Nuwara Eliya	17.9	-	17.9	18.6	-	18.6
Badulla	20.2	-	20.2	20.4	-	20.4
Kandy	12.7	-	12.7	13.8	-	13.8
Kegalle	7.2	-	7.2	7.5	-	7.5
Kalutara	15.8	9.4	25.2	14.5	14.4	28.9
Gampaha	8.4	3.0	11.4	12.7	9.0	21.7
Anuradhapura	11.3		11.3	13.6	-	13.6
Hambantota	5.3	7.0	12.3	4.9	7.8	12.7
Kurunegala	8.3	15.0	23.3	14.2	16.0	30.2
Puttalam	18.6	-	18.6	31.6	-	31.6
Total	125.7	34.4	160.1	151.8	47.2	199
Average	12.6	8.6	16.01	15.18	11.8	19.9

Source: Hitihamu and Epasinghe, 2009

9.2. Haritha Lanka Program

Sri Lanka has developed the National Action Plan for the Haritha Lanka Program from 2009-2016. This project was intended to ensure that sustainability would not just remain a concept but would translate into practical reality. Haritha Lanka Program has ten broad mission. Those are Clean Air - Everywhere, Saving the Fauna, Flora and Ecosystems, Meeting the Challenges of Climate Change, Wise Use of the Coastal Belt and the Sea Around, Responsible Use of the Land Resources, Doing Away with the Dumps, Water for All and Always, Green Cities for Health and Prosperity, Greening the Industries and Knowledge for Right Choices.

9.3. “Api Wawamu-Rata Nagamu”

“Api Wawamu-Rata Nagamu”, a special development drive accelerated under the purview of Ministry of Agriculture. It was the national campaign to encourage towards production of indigenous food crops by adopting short term and mid-term strategies with the objective of saving foreign exchange. The project is in keeping with the National Agriculture Policy of cultivating every inch of arable land implemented from 2007 to 2013.

The main objectives of the programme are growing of 23 locally cultivated food crops by imposing import restriction on same, ensuring the food and nutrition security of the people, reduction of foreign exchange required annually for food imports, increasing the income levels of the farmer community and the reduction of the use of chemical fertilizer by the increased utilization of organic fertilizer during the next few years. In order to achieve the above objectives, the following strategies are to be adopted.

- Promotion of home gardening.
- Increasing the selected crop production.
- Make use of the State-owned farms for production purposes.
- Cultivation of colony lands, private and state lands.
- Promoting of the production and utilization of organic fertilizer.
- Promotion and dissemination
- Rationalization of marketing.
- Minimization of post- harvest losses.

9.4. “Deyata Sevana”

The National Tree Planting Programme by planting 1,100,000 trees island wide was launched in 2010, aligned with the *Mahinda Chinthana – Vision for the Future* in realization the commitment towards a “Greener Country”. This has been a sustainable environment initiative with multifaceted benefits- conservation of micro catchments, ensuring the nations water security, and enhancing important life support systems and positively contribute to the “*Divi Neguma*” program as well. This mega tree planting program played an appreciable role towards conservation of bio diversity and addressing global environmental issues such as climate change and land degradation.

9.5. “Divi Neguma”

“*Divi Neguma*” development program which was undertaken by the Divi Neguma Development Department under the purview of Ministry of Economic Development. The main objectives of the department were to carry out development activities as may be required to alleviate poverty and to bring about a society guaranteeing social equity, to promote the individual, family, group and community centered livelihood economic development activities, to ensure food security for each individual and family; and to mobilize and empower people to speed up the national development.

In fulfilling the mentioned objectives, in 2011, 1.5 million home gardens were strengthened in order to achieve self- sufficiency in vegetables and to reduce vegetable prices.

9.6. “*Deyata Kirula*”

National Development Exhibition has launched promotion programs to enhance the bio diversity of the country. Aligned to that specific objective, in “*Deyata Kirula*” National Development Exhibition starting form 2011, there was a demonstrating stall to showcase the importance of Agro- Biodiversity in the field of Bio- Diversity conservation explaining the importance of keeping higher species mix in the home garden. It displayed about 32 mango types, 20 Banana varieties and 17 traditional rice varieties in the stall to explain the country’s genetic diversity where mango has been demonstrated as a “Charismatic species “. The objective of this was to sensitize people on species diversity and promote conservation and sustainable use.

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