

Modern Trends and Distribution Patterns of Kitchen Gardens in Sri Lanka (A Case Study in Biyagama area)

T.W.M.T.W. Bandara

Abstract

Kitchen garden and its benefits are the one of the most important topics at present for household food security. Kitchen garden is one of the Agro-forestry practices that also can be defined as an approach of sustainable development process as a solution for the deforestation and food crisis in future. Agro-forestry is a concept of combination of forestry and agriculture. There are sub divisions in agro forestry system including Home gardens, Ally Cropping systems, Forest Farming, Salvo-pastoral systems, Wind brakes and Riparian buffers. The kitchen garden is a sub agroforestry system of home garden. This research has focused on kitchen gardens in a semi-urban area of Biyagama South of Gampaha in the Western province in Sri Lanka. Home gardens have been evolved with the human development. Land fragmentation and increasing demand for land have been changing over time resulting various types of kitchen garden patterns with the diverse types of tree and crop species along with new technologies. A kitchen garden can be created by planting different types of herbs in an open space, pots, rakes, umbrella type or containers with the added benefit of mobility. Although not all herbs in pots or containers, but some herbs do better than others do.

Introduction

Kitchen garden, a day-to-day concept in the present world can be defined as a form of agro-forestry. This comprises the phenomena of sustainability which plays a role against such issues as deforestation and food crisis. Being a form of agro-forestry system, kitchen garden inherits characteristics of agro-forestry. World Agro-forestry Centre defines *Agro-forestry as a collective name for land use systems and practices in which woody perennials are deliberately integrated with crops or animals on the same land management unit. The integration can be either in a spatial mixture or in a temporal sequence. There are normally both ecological and economic interactions between woody and non-woody components in agro-forestry.*

The kitchen gardens play a vital role as an agro-forestry system. The significant characteristic is that kitchen gardens are established as a part of its home gardens in some areas of the island. As a concept 'Kitchen Gardens' has a long tradition and it is not a new born concept or a newly introduced agricultural practice for Sri Lankans. Generally, a larger land area has been devoted for a traditional Sri Lankan home garden where an assemblage of plants including trees, shrubs, vines and herbaceous plants are grown. The main purpose of having a home garden is to sustain the family with daily needs of fruits, vegetables and spices. The traditional home garden has been evolved over time. In other words, the structural changes of the traditional home garden have been modified due to many such reasons as rapid growth of population, urbanization and industrialization that led the per capita land holdings to be reduced. Accordingly many people especially the urban dwellings moved to the alternative of Kitchen Garden as the allocation of land for home garden became limited. In this relation a kitchen garden can be defined as *a useful home based garden pattern where vegetables, fruits, spices and other plants are grown within a limited space primarily for household consumption (Author).*

As home gardens in Sri Lanka vary not only in accord to socio-economic and environmental conditions but also regarding many factors such as land fragmentation and high demand for land and it varies spatially. As a result there are different types of patterns of Kitchen Garden where different type of trees, crops, and legumes are grown while adopting new technologies as well. A kitchen garden can be built up by planting trees on ground whereas spices, herbs and legumes are grown in open space, pots, racks, umbrella type or containers with the added benefit of mobility. The important fact is that not all herbs in pots or containers are

productive and therefore it is necessary to identify the productive species of herb that is advisable to keep in a container or it will take over the whole garden.

This research studied the kitchen gardens in a semi-urban area called Biyagama South in Gampaha district in Sri Lanka.

Research question

- What are the Kitchen garden pattern variations and trends in Biyagama south area?

Objectives

The primary objective of this study is to:

- study kitchen garden patterns in Biyagama south

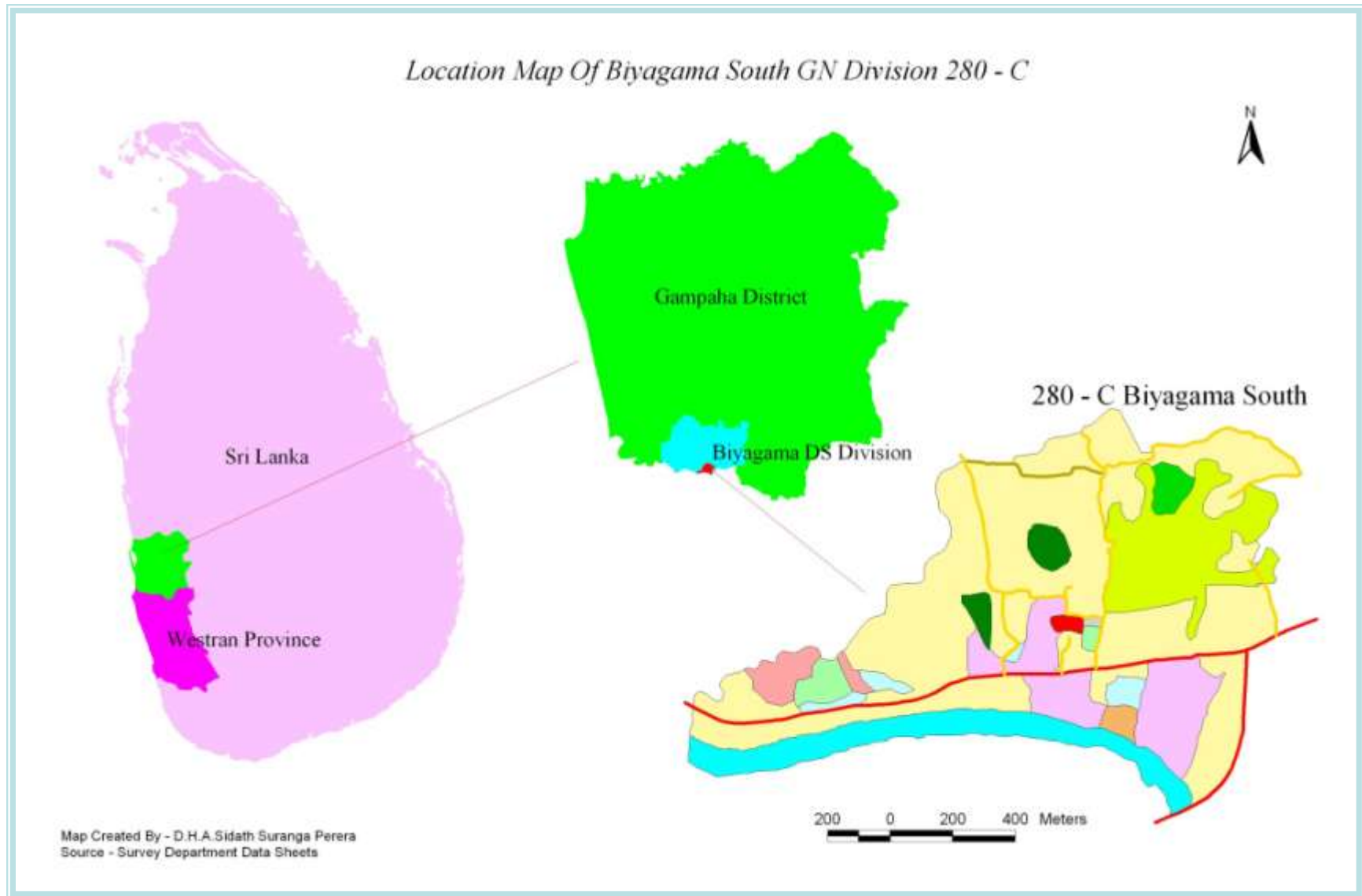
The secondary objectives are to:

- Understand the variation of kitchen garden patterns
- Compare the new trends of kitchen gardens in rural and urban areas

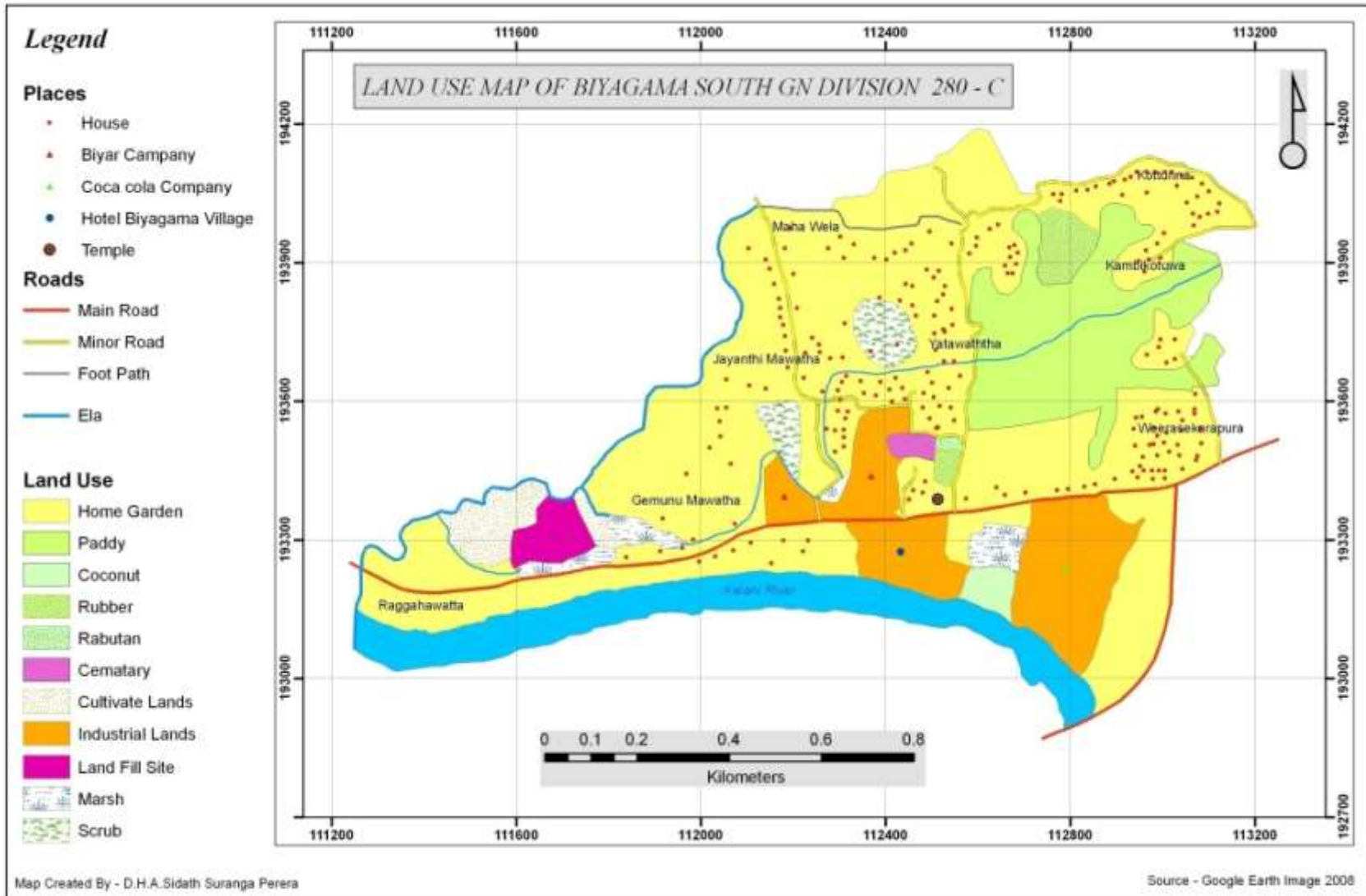
Study Area

Absolute Location of the study area is North latitude $6^{\circ}56.40.25$ and Eastern longitude $79^{\circ}59.22.46$. The mean sea level of the area is 21 m. Biyagama South area is located in Gampaha district in Western province and is located in an ancient river port in Kelani River bank with a distance of 12 km to the Colombo main city. The area is bordered by Kelani River from south, Biyagama East GN division from the east, Biyagama west GN division from the west and Biyagama North GN division from north. (Map No-01)

Map No-01



Map No-02



Irrigation and Topography

Since study area is located in the low lands, the topography of the area inherits a flat terrain but a hilly area towards the Kelani Right bank can be seen. Marshy lands located near to Kelani River bank in the south of study area are annually spill during the monsoon seasons. Kelani River as the main irrigation source provides basic water needs. There are other irrigation systems including *Raggahawatta Ela* and *Puwakpitiya Ela*. Although there are paddy lands in the study area, they have been abandoned for a long period of time. (Map No-2)

Climate

In terms of climatology, the area is located in wet zone of Sri Lanka where the monthly temperature is about 27 C°. This area receives an annual rainfall of 2000mm primarily from south-west monsoon (May to September) while a three months dry period can be experienced from December to February. In addition, inter-monsoon, convectional and cyclonic rain also pours down significant rainfall over the study area during October to November and March to April.

Rock and Soil Structure

The following four types of geological zones can be identified in study area according to the geological survey map publish by the survey department.

1. Biotite and hornblendes gneiss
2. Chanockites
3. Alluvium
4. Cordierite garnet biotite gneiss

Two main soil types found in the study area are:

1. Red yellow podzolic soil

2. Bog and half bog soil

Plants and Animals

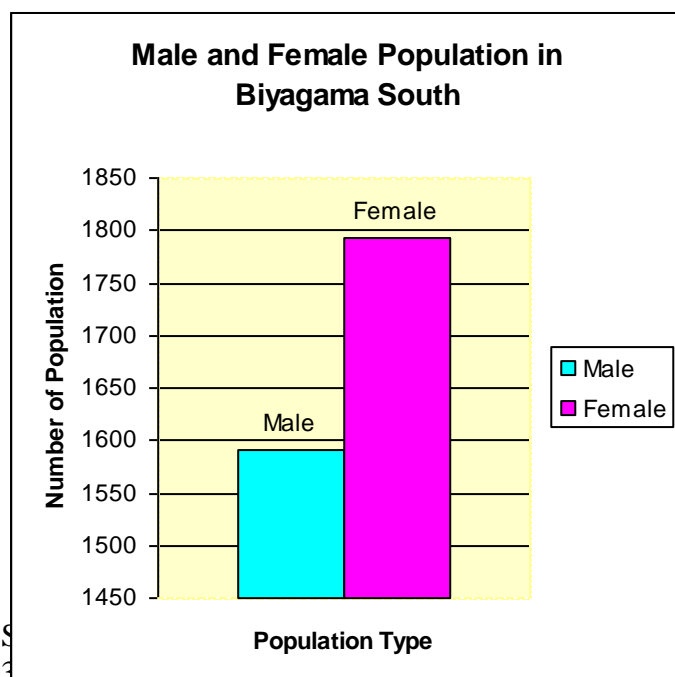
Since the study area is located in wet zone, evergreen vegetation is commonly found. There are large, moderate, and small trees in the study area. Large trees include *Jak, Mara, Nedun, Del, Halmilla, Midella, Keena, etc.* Moderate trees like *Mango, Erabadu, Weli atta, Guava, Eta mara, Rambutan, kenda* and small trees, bushes, and plants are distributed over the study area. A variety of grasses namely, *Belathana, Nidikumba, Eraminiya, Hathawariya, Keppetiya, Maru wel, and Neera mulliya* are also found in the study area.

As the Biyagama South is a semi urban area, only a few domesticated animals such as dogs, cats and cattles can be identified while wild animals such as *Meeminna, Weli muwa, wild Rats, Hothambaya, Kalawedda*, reptiles and birds are also found in this area.

Socioeconomic details in Study Area

Total area of Biyagama is 180 acres with 670 families. Total population of 3383 includes 1792 females and 1591 men. (Chart No.1)

Chart No 1



No. 02, March 2015, ISSN: 2279-

Population Characteristics

Ethnicity

	Ethnic type	Number of People
1	Sinhala	3375
2	Tamil	4
3	Muslim	4

Religion

	Religion type	Number of People
1	Buddhist	3375
2	Christian	4
3	Islam	4

Occupation structure

	Occupation	Number of People
1	Government sector	104
2	Banking sector	53
3	Private sector	264
4	Pottery industrial owners	84
5	Pottery industrial labors	168
6	Three wheel drivers	24
7	Other	4

Methodology

Sampling

Biyagama south comprises eight villages of which Yatawaththa was selected for field survey as it inherits the characteristics of rural, semi urban and urban as well. 20% of sample was selected by using the simple random sampling method where by 10 households were selected from the total of 48.

Data Collection

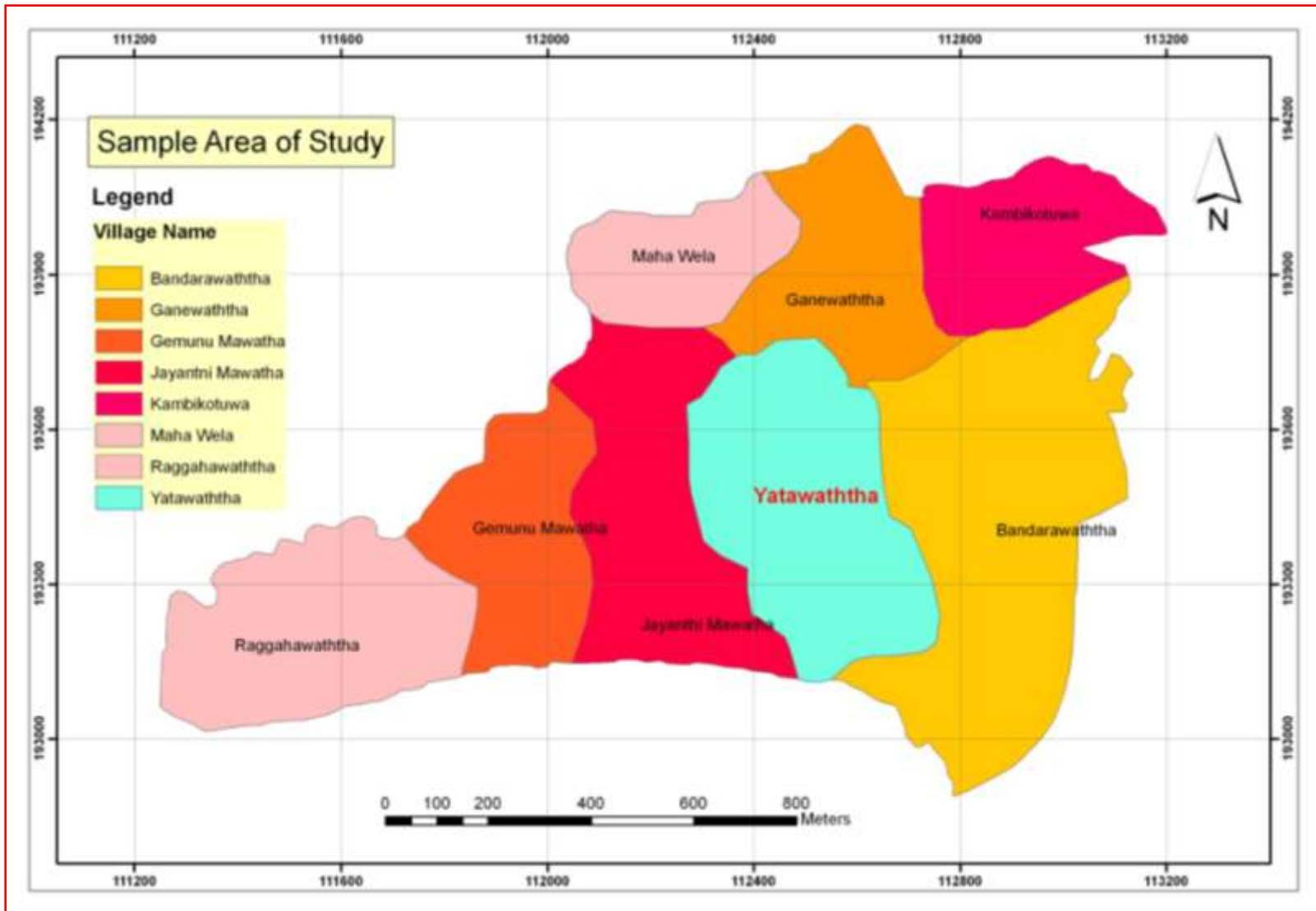
Data of this study is primarily come in the form of primary and secondary. Primary data are collected from:

1. Observation
2. Discussion
3. Experiment

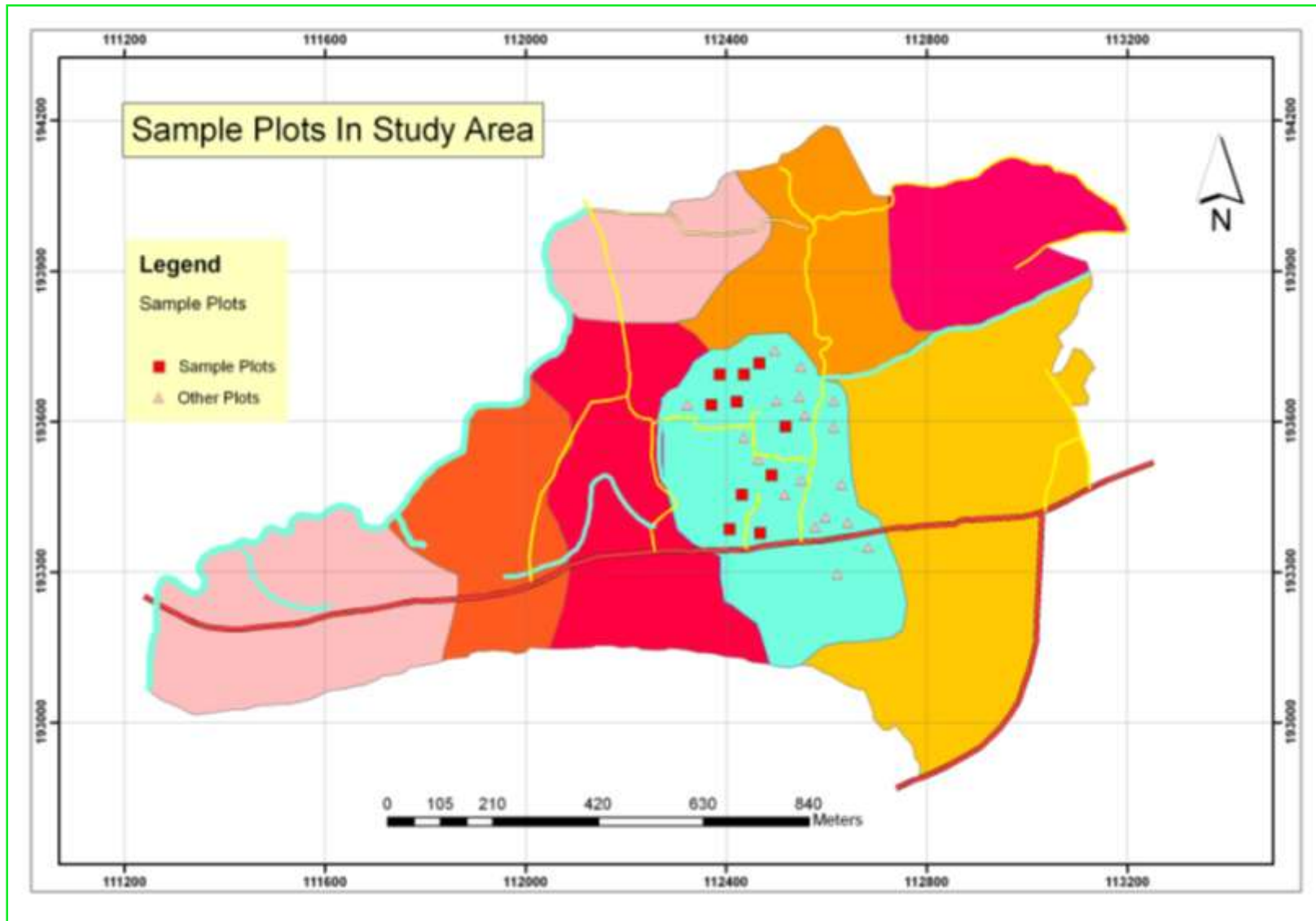
Ten households were selected to gather information through discussions and observations. In addition, data was collected from the respective member of Pradeshiya Sabha, the former GN officer and three people representing the older generation of the study area. Secondary data was gathered from *Grama Niladari reports*, *Sampath Pethikada* and other books and publication related to the field of research.

Data were analyzed to get a picture of new trends, changes and patterns in kitchen gardens.

Map No-3



Map No- 4



Data Analyzing

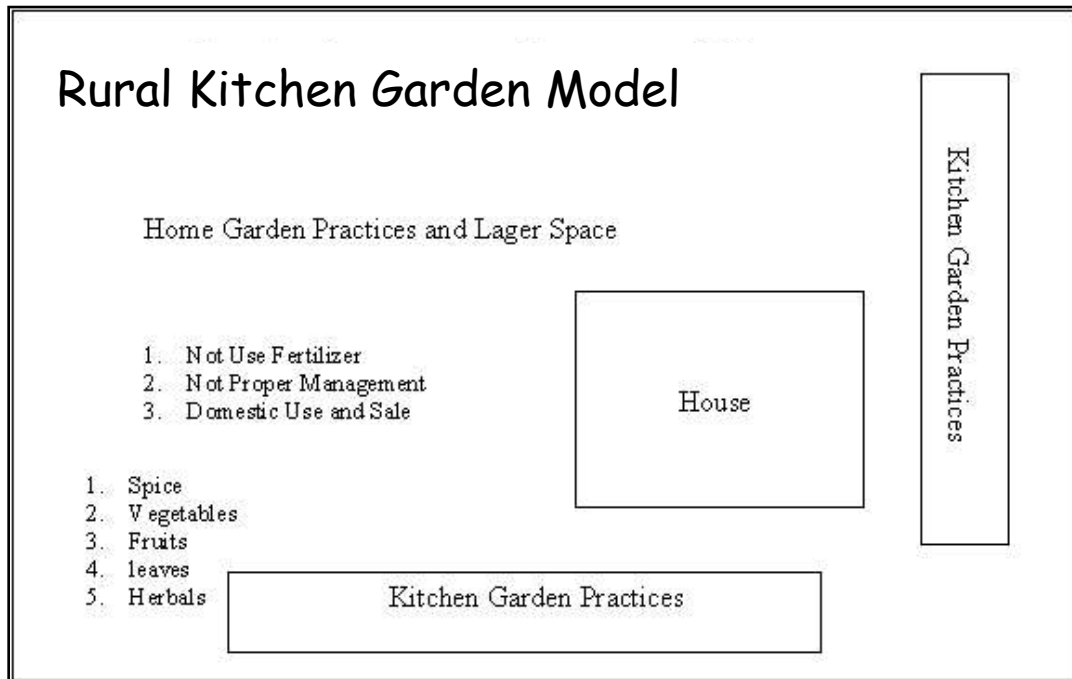
The data was analyzed by MS Excel to get a picture of trends and patterns through data tabular sheets and charts. GIS was also used in Spatial analyzing to identify sample plots and Natural Neighbor Analyzing methods were used in order to find spatial distribution of kitchen gardens in the study area.

Results and Discussion

Regional variation of the home gardens in Sri Lanka is depend on the climate, soil and agriculture. In terms of those factors, there are four types of home gardens in Sri Lanka, including, Dry Zone home garden, Wet Zone home garden, Udarata home garden and Plantation based home garden. Since the concept of 'Kitchen Garden' comes under the umbrella of home gardens, there is no significant difference of classification of kitchen gardens in Sri Lanka. However, as kitchen gardens developed with the limited space and urbanization, its classification can be further expanded. The methods and the practices of kitchen gardening is depend on the householder's needs, spatial development, and socioeconomic components. There are four types of kitchen garden patterns. These include;

1. Rural kitchen gardens
2. Semi urban kitchen gardens
3. Urban kitchen gardens
4. Domestic type kitchen gardens

1. Rural kitchen gardens



Source: Author preparation

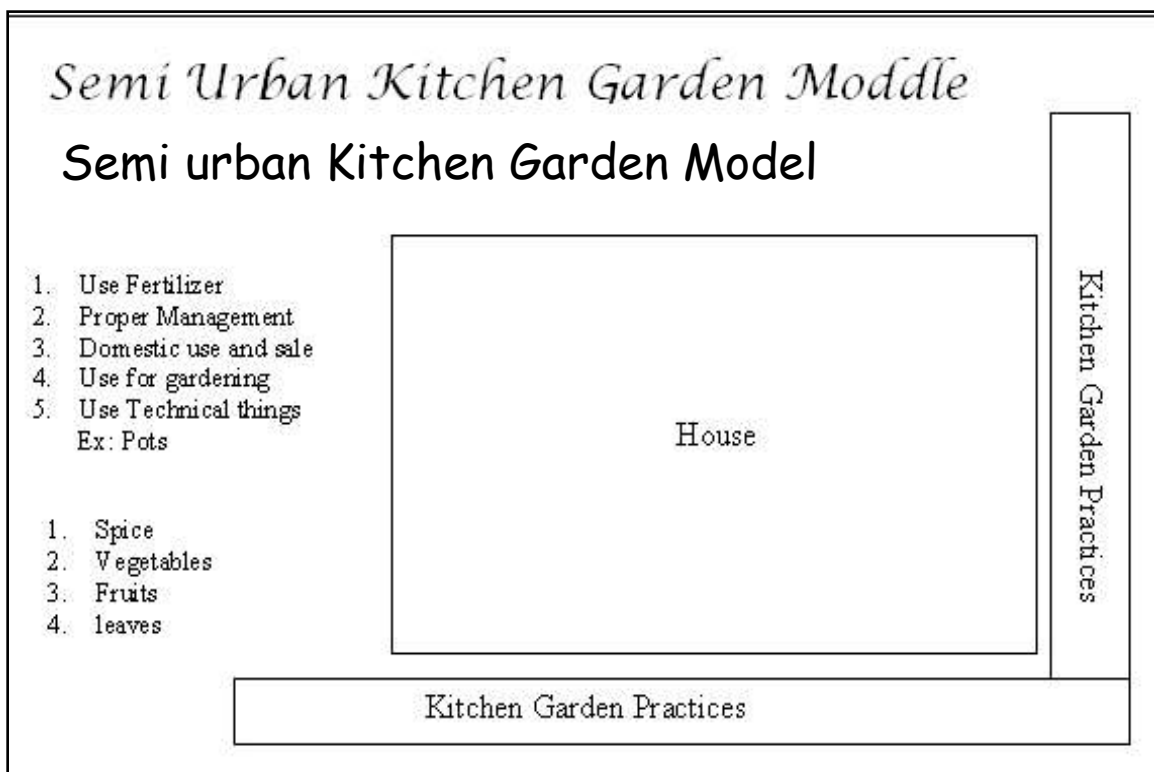
Model No - 01

This type of kitchen gardens is in the rural areas of Sri Lanka. Particularly they are found in dry zone where the rural settlements are largely established. Moreover, these kitchen gardens can be also seen in both wet zone and intermediate zone as well. The significant characteristic of the rural kitchen garden is the distribution of it in a lager land area. As a result of rural settlers own a larger area for their home gardening purposes. In a nut shell, it is clear that the larger area of the rural home gardens is devoted for the kitchen garden. These rural kitchen gardens comprise with different types of crops and other plants for their daily cooking needs.

As mentioned earlier, a larger area is assigned for the rural kitchen gardens with the intention of fulfill the daily kitchen needs. Due to the availability of land area, the owner of the land builds the home according to his personal desires. The rest is devoted for home gardening purposes. The back yard and the sides of the home are utilized for Kitchen garden practices cultivating vegetables, spices, leaves, herbs, fruits and yams.

It is hard to identify the clear difference between a kitchen garden and a home garden under this model because the kitchen gardens in rural areas are depend on its home garden. But it can be identified that the crops of daily kitchen needs are grown beside and backyard of the home while the front area is devoted especially for landscaping. The surplus of the production of kitchen garden is sold or shared. The significant characteristic is the informal management without using chemical fertilizer but by means of animal waste and compost. Women contribution in managing the rural kitchen garden cannot be assessed.

Semi-urban kitchen gardens



Source: Author preparation

Model No - 02

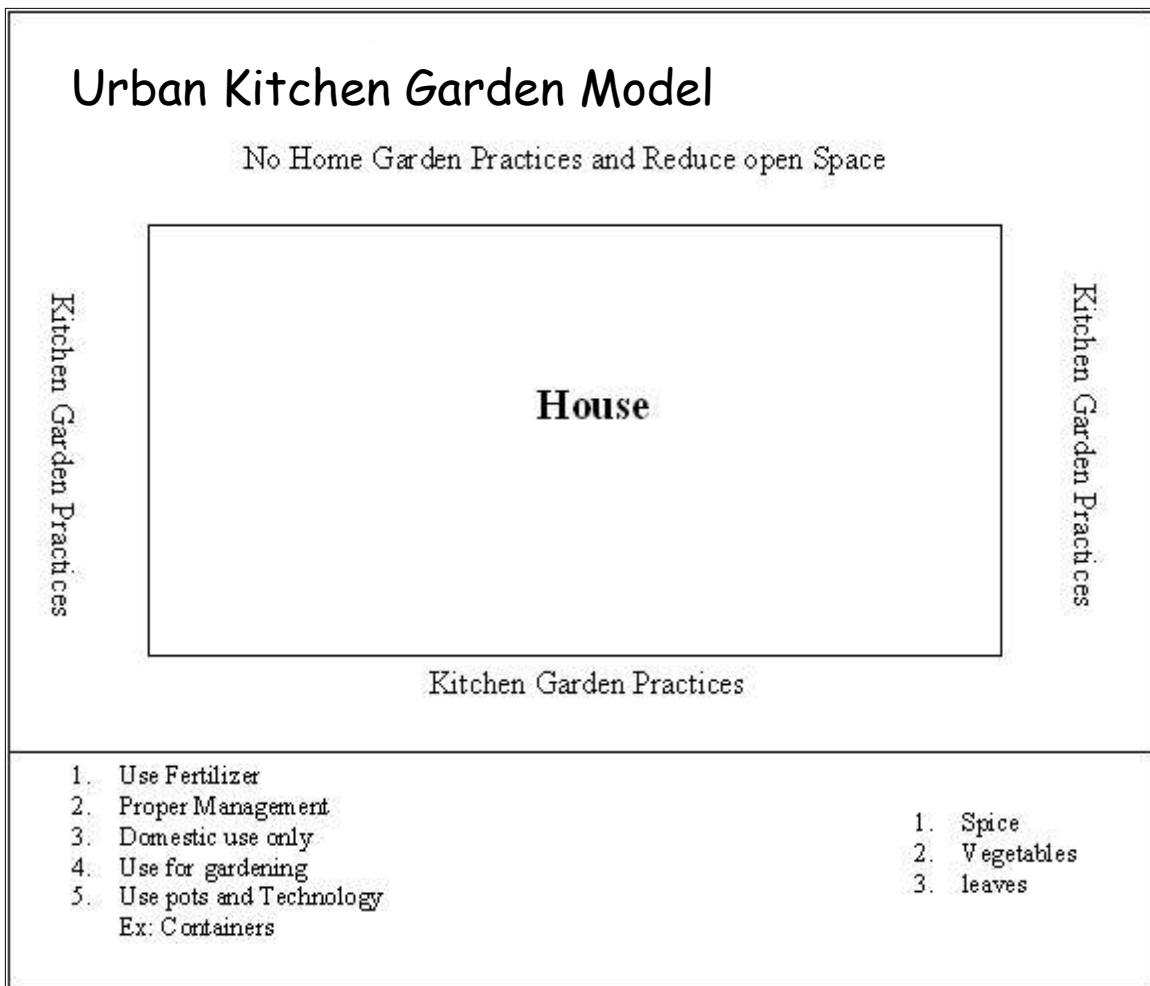
Semi urban kitchen garden pattern is distributed over rural and urban areas of Sri Lanka. Particularly this type of kitchen gardens can be found where both rural and urban characteristics are existed. In these areas, land demand is high even for a plot of land. As a result almost all the lands with limited space find no space for cultivation. Nevertheless,

limited space is utilized for kitchen garden in which crops and other plants for their cooking needs are grown.

Semi urban model does not comprise a larger area to cultivate. Since the entire land area is allocated for a house, a small land area of 0.5 perch to 1 perch is devoted for the kitchen garden purposes. Except the front area of the house, rest is arranged with crops and plants for daily use.

Not like rural kitchen gardens, semi urban model does not depend on the home garden and it can be clearly identified home garden and kitchen garden separately. Both crops and plants are grown in this type of kitchen gardens where the surplus of production is also sold. A daily proper management of kitchen garden is a common feature in the study area by using both compost and chemical fertilizer. The limited front space is converted into a small landscape garden which gives aesthetic value with different types of horticultural plants. In the area where kitchen garden is established, different types of vegetables and legumes are grown especially using the method of wall type agriculture. Both women and men take a part maintaining this type of kitchen gardens.

Urban Kitchen Gardens



Source: Author preparation

Model No - 03

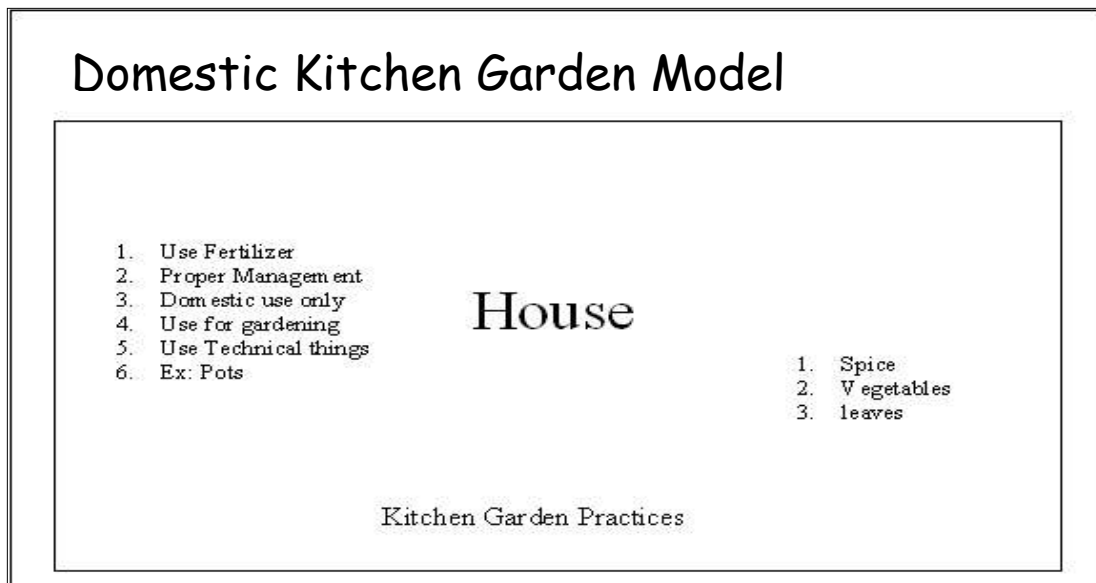
Urban kitchen gardens itself indicate the places where the

Households in urban areas in Sri Lanka inherit urban kitchen gardens. Since the land availability is limited in urban areas, many of the houses are constructed in the form of flats and as result, the householders have to create an environment for their daily kitchen needs by themselves. In addition, there are some individual houses on urban lands with not more than 20 perches. However these urban dwellers convert their concrete frontiers to green kitchen gardens with pot based crops and vegetables.

With a limited land area which is also surrounded by huge concrete structures urban dwellers use their entire land for the house and then they create their kitchen garden on backyard, inside and besides of the house where particularly vegetables, spices and leaves are grown.

The main feature of the urban kitchen garden is not having a home garden. The production of this type of kitchen garden is used only for the purpose of household consumption as it does not produce a surplus. Most of the urban kitchen gardens use chemical fertilizer and it is maintained daily. The compound area of house and beside of the house they use for kitchen gardening. The daily management is part of dwellers day to day life. Urban kitchen garden comprises horticultural plants, vegetables and crops and they are usually grown in containers and pots.

Domestic kitchen garden model



Source: Author preparation

Model No - 03

Domestic kitchen garden uses new agricultural techniques where dwellers grow crops and vegetables on a small space in urban and semi-urban areas. Indoor gardening is

the basic feature of domestic kitchen gardens. This type of gardens is built in front or the verandas of the house.

Using indoor garden method dwellers grow a variety of plants such as horticultural plants, vegetables and crops together. Since domestic kitchen garden does not produce a surplus, the purpose of creating it is to fulfill daily needs of cooking. These gardens are maintained properly and used chemical fertilizers. New agricultural techniques such as hydroponics, wall type, container type, pots and umbrella type are used to grow the plants and crops.

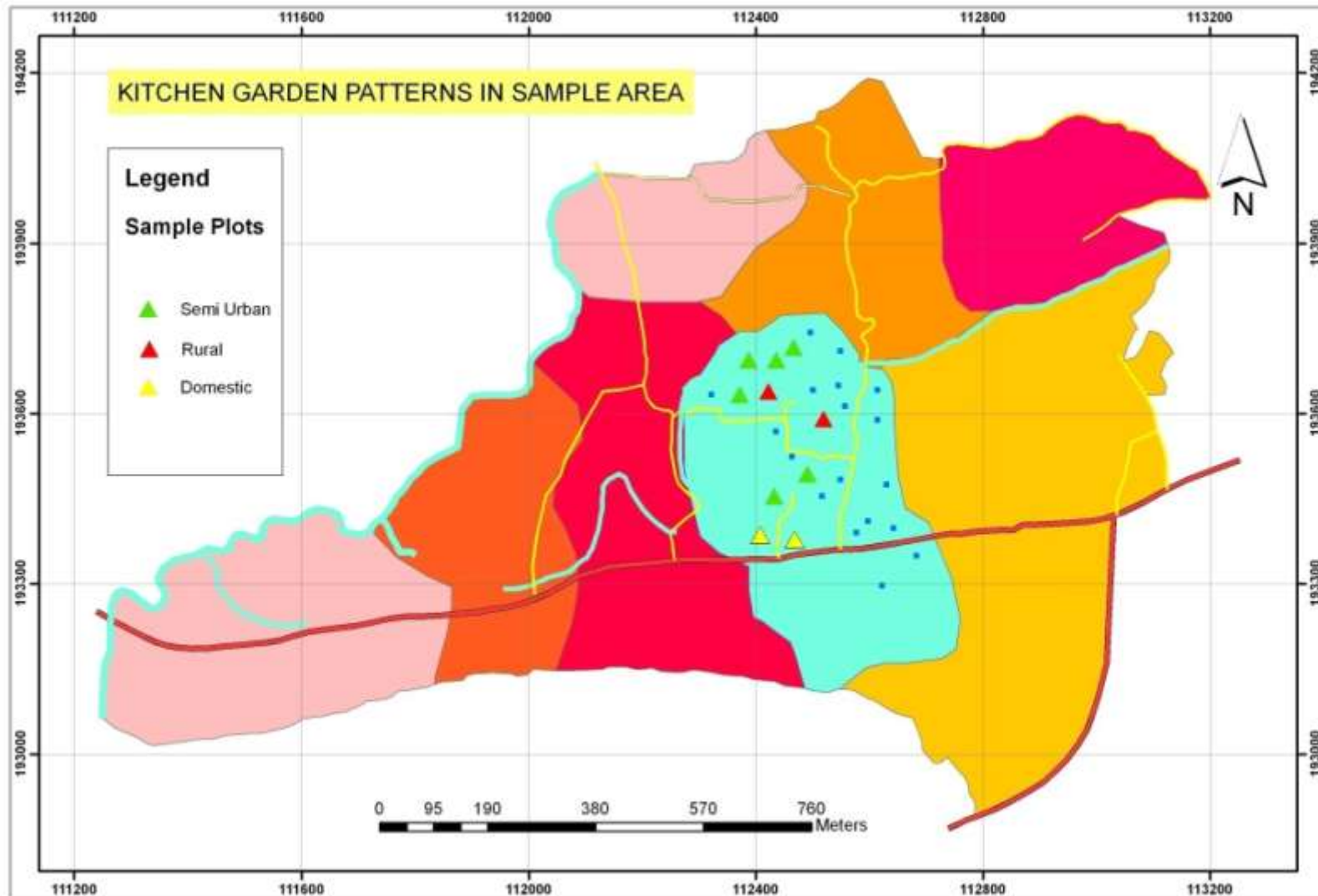
Kitchen garden patterns and its distribution in study area

Although the study area is a semi urban region, there are rural, domestic and semi urban regions. It is clear that the types of kitchen gardens vary from town to village. Domestic kitchen gardens are scattered along the main road (Colombo-Gampaha B-214) while rural and semi-urban kitchen gardens are located away from the main road. The significant characteristic is that this study area does not have any urban kitchen gardens as it is located in a semi urban area. (Map 05 & 06).

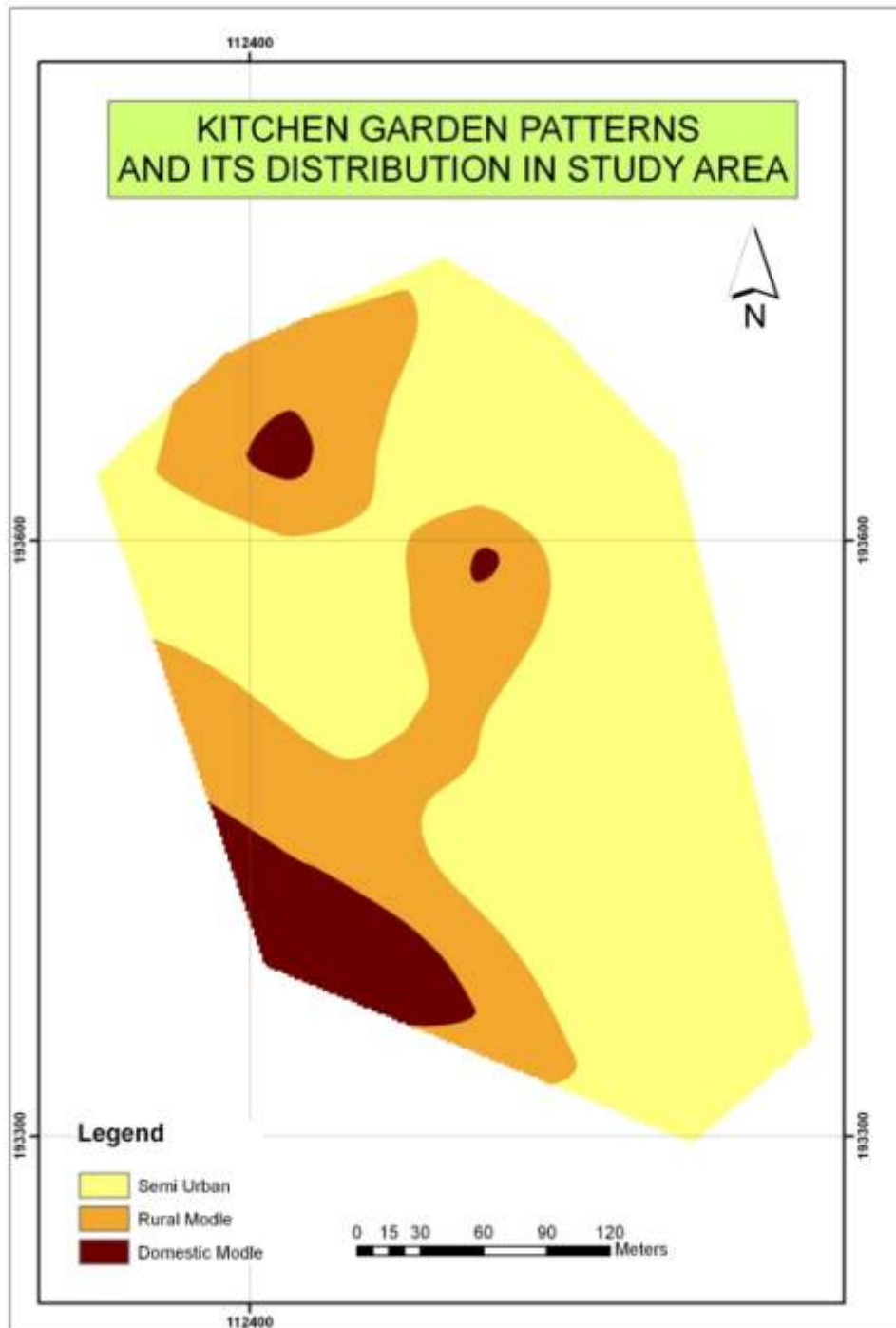
Rural kitchen garden practices in the study area.

Twenty percent of the study area comprises rural kitchen gardens. (Chart - No 2) These gardens have been distributed over a larger area with a combination of different types of crops, vegetables, herbs and leaves.

Map No- 5



Map No- 6



Type of Crops	Variety of Crops
Vegetables	ladies fingers, Brinjole, Kohila
Leaves	Gotu Kola, Kathuru Murunga
Fruits	Papaw, Pineapple, Avocado
Spices	Curry leaves, Ranpe, Ginger , Chilies
Yams	Manioc, Kiri Habarla, Sweet potetos
Herbals	Turmeric, Ginger, Aloe vera



Kohila



Brinjole



Gotu kola



Lady fingers



Chilies



Papaw



Pineapple

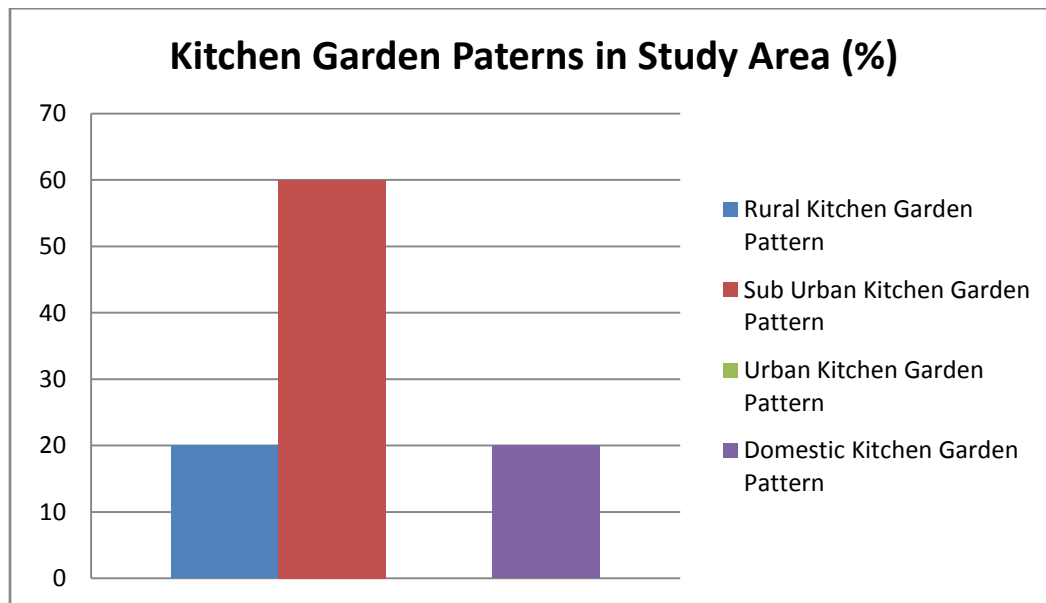


Avocado



Manioc

Chart No -2



Semi Urban kitchen garden practices in the study area.

The most prominent kitchen garden pattern in this area is semi urban kitchen garden pattern. 60% of the kitchen gardens inherit a pattern of semi urban where kitchen gardens have been shared out a small land area than rural pattern. The significant characteristic is that these gardens use both the available space and technical agricultural methods such as bags and pots and container pillars to grow crops. Different types of crops are grown for the dwellers daily kitchen needs.

Type of Crops	Variety of Crops
Vegetables	Cabbage, radish , ladies fingers, Brinjole
Leaves	Gotu Kola
Fruit	Papaw, Pineapple, Avocado
Spices	Karapincha, Ranpe, Ginger , Chilies



Radish



Chilies



Cabbage



Chiles



Chilies



Cabbage



Horticulture with gotu kola



Horticulture with betel and
kathurubmurunga

Domestic kitchen garden practices in the study area.

Twenty percent of the kitchen gardens represent a domestic pattern which has been distributed over the smallest land area. (Chart 02) Crops are grown in this model by using the indoor gardening method by which the front and the verandas of the house are converted into green cover. Since the entire land is devoted for house, the inside of front area and verandas transform into kitchen gardens by adopting new such techniques as hydroponics, wall and container type pots and bags.

Type of Crops	Variety of Crops
Vegetables	ladies fingers, Brinjole, tomato
Leaves	Gotu Kola
Fruit	Papaw
Spices	Curry leaves, Ranpe, Ginger , Chilies

Benefits and new trends on the kitchen gardens.

Kitchen gardens enhance the livelihood of householders providing social, economic and environmental benefits.

Social benefits

1. Production of fresh home-made kitchen needs such as vegetables, fruits and herbs improving the health conditions of the household.
2. Enhances the food security eradicating the poverty.
3. Conservation and landscape management with improving both mental and aesthetic values.
4. Advances the attitudes on agriculture activities

5. Reinforcing the food security of household unit.
6. Provides social relations between villagers and household members by sharing the kitchen garden production.

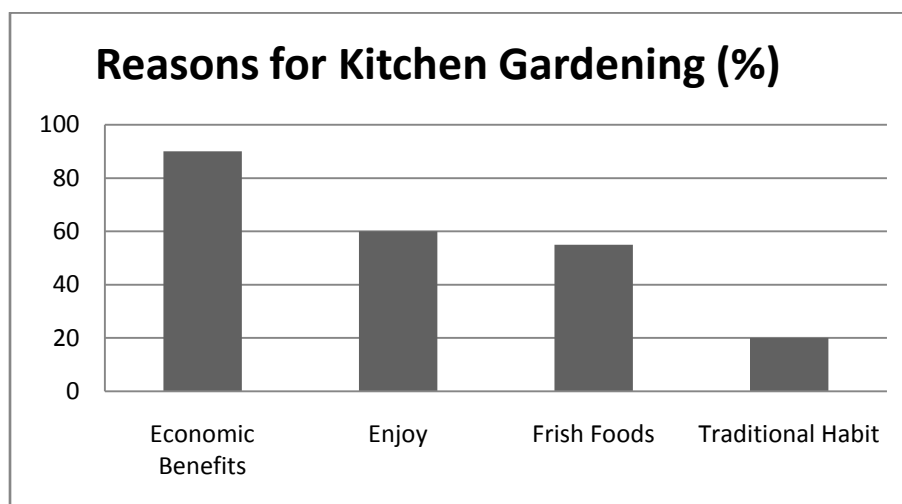
Environmental Benefits

1. Development of landscape management.
2. Preserves biodiversity in the home garden.
3. Conserves the land degradation.
4. Preserves microclimate.
5. Create habitat for different types of flora and fauna.

Economic benefits

1. Reduce cost of living.
2. Provides extra income.

Chart No -3



New Trends in Kkitchen Garden in Biyagama south

There is an improving attitude on agriculture in Sri Lanka as the prices of agricultural products are increasing and the absorption of fertilizers and pesticides in the fields. A number of trends regarding the kitchen gardens in the study area also could be identified.

1. There is competition between villagers to build up a good home garden because of the lottery program organized by Sri Punghawardhana society in Biyagama South by which the best home garden will be rewarded.

2. A mix crop pattern which differs from the other regions in Sri Lanka can be identified. The horticulture with crops and vegetables is a common feature in the study area. Example – Anthurium with Chilies



Horticulture with gotu kola



Horticulture with Chilies



Horticulture with betel

4. Building up kitchen gardens as an alternative method of horticulture.



Conclusion

Being a sub division of agro forestry, kitchen gardens provide economic, social and environmental benefits. A kitchen garden is directly connected with home gardens of Sri Lanka where the above benefits are gained at different levels. The study in Biyagama south gives us a clear picture about the rural, semi urban and domestic kitchen gardens. It can be concluded that these kitchen garden patterns depend on the regional settlement patterns. It is also clear that these kitchen gardens rest on the resource distribution and the physical conditions of the area.

The improving trends regarding the kitchen gardens in the study area reveal that many dwellers have paid attention to develop a quality garden. The thirst to develop a kitchen garden is a result of increasing prices of agricultural productions which are grown under rains of fertilizers and pesticides. The pattern of kitchen gardens also exposes the sustainable and optimum use of land which shows the lust for a green cover.

Maintaining a good kitchen garden affirms the safety of the food availability of the household. The daily management of these gardens especially by the women contributes their non-paid labor for both short and long term benefits. The local government encouragement for developing these gardens opens up the creativity and management of the dwellers. Although these programs persuade the society for a better

future without a food crisis, there are a number of households who might not pay interest on this strategy. In brief, a kitchen garden can be the best alternative for urban and semi-urban dwellers to sustain the family with fresh and organic foods where by people lives healthier. The optimum use of limited space creates a microclimatic unit which appeases people mentally and physically.

Acknowledgement

I am immensely grateful and sincerely thankful to people in Biyagama area, Grama Niladaris and Samurdi Development offices who devoted their valuable time in providing me the necessary data, information and their hospitality during my fieldwork time. I wish to thanks to Mr. Sidath Perera who help me lots to analyze the data and map preparation. Finally I take this opportunity to thanks University of Peradeniya for their financial support.

References:

- Fernandes, E. C. M. and Nair, P. K. R. 1986. An Evaluation of the Structure and Function of Tropical Homegardens (Working Paper No 38). [Online] 1986. http://www.worldagroforestry.org/downloads/publications/PDFs/69_Working_paper_no_38.pdf.
- Jacob, V. J. and Alles, W. S. 1987. The kandyan Gardens of Sri Lanka. *Agroforestry Systems*. 1987, Vol. 5, pp. 123-137.
- Mendez, V. E. 2000. An Assessment of Tropical Home-gardens examples of Local Sustainable Agro-forestry Systes. [ed.] S. R. Gliessman. *Agro-ecosystem Sustainability: Developing Practical Strategies* . Boca Raton Fl (USA) : CRC Pres, 2000, pp. 51-66.
- Michael Gertley, Jan Gertley. 2007. *Art of the Kitchen Garden*, Taunton Press, United States.
- Richard Bird. 2005. *Kitchen Gardens*, Southwater Publishing, London.
- Sampath Paticada. 2011. Biyagama Divisional Secretary Office, Biyagama.

- Wickramasinghe, A. 1994. Comparative Study of Sources of Tree Products and Tree Use Practices of Small Farmers in South Asia. [ed.] N. C. Saxena and V. Ballabh. Farm Forestry in South Asia. New Delhi : Saga Pub
- **Wickramasinghe, A. 1995.** Do Home-gardens Vary in Spatial Arrangements. [ed.] H. P. M. Gunasena. *Sri Lanka Journal of Agricultural Sciences*. University of Peradeniya : National Agricultural Society of Sri Lanka.
- **Wickramasinghe, A. 1995.** Homegardens: Habitations Rescuing Biodiversity. [ed.] H. P. M. Gunasena, et al. *MPTS NEWS*. Sri Lanka : Multipurpose Tree Species Net Work, 1995d, Vol. IV, pp. 1-4.
- http://en.wikipedia.org/wiki/Forest_gardening