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Land Use Under Homestead in Kerala: The Status of Homestead Cultivation from a Village Study

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LAND USE UNDER HOMESTEAD IN KERALA: THE STATUS OF HOMESTEAD CULTIVATION FROM A VILLAGE STUDY

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Abstract

This paper is an attempt to analyse the land use under homestead in the context of land-use change that has been extensively taking place in Kerala. The features of homestead gardening, its importance, the present status and the obstacles in home gardening have been given prime focus. Homesteads are traditionally used for self-sufficiency and pleasure. But due to real estate boom, we observe large scale conversion of agricultural land and fragmentation of holdings. In this context, homestead cultivation is considered to be the most suitable form of cultivation. The study finds underutilisation of land under homesteads due to lack of sufficient incentives for growing in homestead. Though the structural and functional diversity of the traditional homestead gardening has been not observed, a preference for perennial crops makes the homestead more homogeneous across households. Such monoculture affects not only food security but also biodiversity and ecology. This situation may lead to a disappearance of home gardens in Kerala.

Key words: Homestead gardening, land use, monoculture, household produce, marketed surplus, constraints.

Background

The land-use pattern plays an important role in agricultural development. The changes in the land use affect the pattern of production and livelihood. In Kerala since land reforms, there has been a structural change in the land-use pattern within agriculture, causing a shift from food to non-food crops. It has also created increased housing plots by giving land to agricultural labourers as homestead for their sustenance and also through private proprietorships[2]. Added to these, the house construction boom, which started in the late 1970s and early 1980s due to gulf migration and the remittance investments in land mainly for house constructions (Gopikuttan, 1990), continue unabated without any restrictions placed on the type of land used for the same (Raj and Azeez, 2009). The investments by gulf migrants of Kerala in land spurred the price and created the demand for house plots. Due to scarcity of land and growing demand for houses, a shrinking land holding size is also commonly observed in Kerala. The reliance on market for consumption of food articles and the decline in food production commonly observed in Kerala have led to an increasing import of food grains, fruits and vegetables from the

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[2] The land reforms measures initiated during 1960s abolished landlordism, put a ceiling on land holdings and gave tenants the ownership right on land. It also gave the agricultural labourers a right on their homesteads.

neighbouring states[3]. Moreover attaining self-sufficiency in the production of vegetables has become a challenge to the state much more now than before as the vegetables importing from the neighbouring states are found to be affecting the health of the people due to over usage of pesticides and chemicals for the production (Balakrishnan, 2015). This has forced the state to produce more food grains and vegetables to bridge the demand-supply gap. All these necessitated cultivation in the homestead and a revival of the traditional homestead cultivation in Kerala.

Homestead cultivation means, cultivation around the immediate surroundings of a house. Homegardening is considered as the oldest land-use activity and has evolved through generations of gradual intensification of crop cultivation in response to two important factors—increasing human pressure and the shortage of arable land (Kumar and Nair, 2006). Such intensification of crops is very important in Kerala considering that land is getting scarcer as it is being increasingly converted for non-agricultural uses. The traditional homegardens have been proved as an integral component of family farming and local food system and agricultural landscape in developing countries all over the world (Wiersum, 2006).Hence the loss of homestead has a bearing on nutritional security of the poor households as their income is insufficient to meet entire household consumption expenditure. Homegardens over the world exhibit some basic features such as they represent a multi-storey combination of various trees and crops in association with domestic animals around the homestead (Kumar and Nair, 2006). They are known by different names such as mixed gardens, farmyard enterprises, kitchen gardens, and traditional food production system at the household level (Ali *et al*, 2005), homegardening, agro-forestry homegardens, household or homestead farms, compound farms, backyard gardens, village forest gardens, dooryard gardens and house gardens (Kumar and Nair, 2006). Homestead production was considered to be a subsystem of the agricultural system that aims to produce items for household consumption that are not obtainable, readily available, or affordable through the field of agriculture and hence needs to be promoted. Being an independent operational unit, growing a number of crops along with rearing livestock, poultry or fish, it helps the farmers meet their basic needs (John, 2014). Homestead cultivation is different from other cultivation as it concentrates only on the immediate surroundings of the home and produces all types of food items using mainly organic manures provided by livestock whose milk and meat provide rich nutritional security to the households. Other cultivation mainly focuses on market demand and is cultivated on land away from their homestead farms (Ali *et al*, 2005)[4].

Homestead cultivation is important in terms of the benefits it confers. There are not only economic benefits but social and environmental benefits too are associated with homestead gardening (Galhena *et al*, 2013). The social benefits include enhancing food and nutritional security in many socio-economic and political situations, improving family health and human capacity, empowering women, promoting social justice and equity, and preserving indigenous knowledge and culture (Mitchell and Hanstad, 2004). The economic benefits in bibliographic evidence suggest that homegardens contribute to income generation, improved livelihoods and household economic welfare as well as promoting

[3] Kerala State Planning Board had formed a working group to come up with a Report on Food security in its 12th Five year Plan, which explains the acute food scarcity in state and its dependence on imports from neighbouring states.

[4] The details are given in Appendix 1.

entrepreneurship and rural development. Studies from Nepal, Cambodia, and Papua New Guinea report that the income generated from the sale of home garden fruits, vegetables, and livestock products allowed households to use the proceeds to purchase additional food items as well as for savings, education, and other services (Iannotti *et al*, 2009; Vasey 1985). The environmental and ecological benefits are conservation of biodiversity and natural resources because they contain a rich composition of plant and animal species, ecosystem services such as habitats for animals and other beneficial organisms, nutrient recycling, reduced soil erosion, and enhanced pollination (Galhena *et al*, 2013).

On the basis of the importance of home gardening, this study focuses mainly on three aspects. First, to assess how the homestead land is being used in the sample village. Secondly, to examine the crops grown and the surplus generated in homestead cultivation, and thirdly, explore the constraints that emerges if the households produce for market. Accordingly, the paper is organised into five sections. Section 2 offers the methodology used for analysing the homestead cultivation; section 3 evaluates the status of homestead cultivation and section 4 examines the constraints and opportunities in homestead cultivation. Major conclusions and implications are listed in section 5.

Data and Methodology

To examine the objectives of the study with respect to homegardens, a survey was conducted in Manimooly village of Vazhikkadavu Panchayat, located in the northern most part of Malappuram district. The village chosen was primarily an agrarian village where the cultivation of paddy, tapioca, and other food crops flourished along with forest trees since the time of migration to the place which started in early 1940s. The measurement of variables, the source and methodology is explained in Table 1.

Table 1: Measurement and Data Source of Variables and Methodology

Variables	How measured	Source	Methodology
Socio-economic characteristics of the village households, homestead area, types and number of crops grown, household labour, hired labour, cost of labour employed, quantity produced under each crop, home consumption, marketed surplus and market price.	The interview schedule consisted of question based on these variables which were put to the households and the responses were elicited and coded for the analysis.	A Household Survey of the entire village in Manimooly village, in Vazhikkadavu Panchayat in Malappuram District for the period 2013 July to 2014 June.	Simple averages, percentage share, and meaningful discussions based on literature review is used.

Source: Field Survey 2013-14

Analysis of the Homestead Cultivation

Socio-Economic Characteristics of the Homestead Households

The village has 360 households. Among these 94 percent of the households have homestead area and these households are found to be cultivating in their homesteads. The remaining 6 percent of the households are not able to cultivate as they do not have place near their residences as they live in rented houses built only for the purpose of renting. These are mainly landless households. The respondents in the village are mostly female (62.2 percent) having an average education of 10 years. The average age of the respondents is 46 years and most of the family had on an average about five members. The females dominated the number of responses as they were more comfortable with the interviewer. The head of the households and other members in the family too participated and provided information. A brief summary of the socio-economic characteristics of the households are presented in Table 2.

Table 2: Socio-Economic Characteristics of the Homestead Households

Sl. No.	Particulars	In %
1	Households with Homestead cultivation	94.2
2	Gender of the respondents (Male)	37.8
3	Gender of the respondents (Female)	62.2
4	**Respondents Caste**	
5	General	56.9
6	OBC	36.6
7	SC/ST	6.5

Source: Field Study 2013-14 in Manimooly Village

The categorisation as early settlers and recent settlers reveals a clear cut agrarian transformation in the village as very few recent settlers are engaged in agriculture (6.7 percent).The early settlers, who had mainly concentrated on farming then, have now turned to some other occupations such as teaching or wage earning or find employment in gulf (22.2 percent). Recent settlers also include the children of the early settlers. Such transformation in village setting and their preference for non-agricultural employment would explain the declining importance of agriculture. This has also affected homestead cultivation which is visible in the analysis.

Characteristics of Homestead Gardens

In Kerala, homegardening is seen as a way of life for centuries and is still critical to the local subsistence economy and food security. The existence of a unique pattern of homestead cultivation in Kerala is seen in its structural and functional diversity. The structural diversity is seen in the multi-storey cropping pattern, where the upper layer occupy perennial crops such as coconut, arecanut, jackfruit, mango, cashew, tamarind, and forest tree species; pepper, clove, nutmeg and cinnamon; the second layer; banana, cassava, yam, and the like, and the third layer, ginger, turmeric, pineapple, vegetables, and guinea grass occupy the ground layer (Snehana *et al*, 1992). This is to achieve higher efficiency in

the resource use by efficiently harvesting solar energy and soil nutrients and moisture and to exploit the space both temporally and spatially (Salam *et al*, 1995). The functional diversity of the system helps to meet the many demands of food, fuel, timber, organic mulch and medicinal plants. Home gardens in Kerala also combine with livestock rearing, where the different components interact synergistically to sustain productivity. Such evolution of homegardens in Kerala represents the wisdom and insight of farmers in response to shrinking of arable lands (Kumar and Nair, 2004).

Analysing the features of homestead gardening in the present study of a rural set up unravels the fact that there is a mixture of both traditional subsistence and commercial homegardening practised in the village. However, less number of crops is grown and there are no consistent and conscious efforts to grow more crops filling the entire homestead area. For most of the families, the homestead crops have come up from the waste thrown out around the house. This reveals that though the fertility of soil is very conducive for growing varieties of crops, they are not grown by their conscious efforts. There are traditional fruit trees grown in the homestead by most of households. They are mango, jackfruit, custard apple, rose apple and papaya. But they are mostly neglected as the surplus generated could not be marketed due to low market price and high labour cost. Moreover, the households also face labour scarcity at the time of harvest and these lead to wastage of fruits. Thus the production under homestead is not efficiently used for consumption. It seems that the nutrition value of these crops is highly undermined by the households. Besides this common observation, the particular characteristics of the homestead cultivation in the village are captured in Table 3.

Table 3: Characteristics of Homestead Gardens in Manimooly Village

Sl. No.	Characteristics	
1	Total Homestead Area (in acre)	81.8
2	Average homestead Area (in acre)	0.24
3	Total number of plants species	33
4	Average number of plant species	9.7
5	Total number of Species in the homegardens (vegetables)	14
6	Fruits grown in homegardens	8
7	Tuber species in the homegardens	3
8	Spices and condiments species	4
9	Coconuts and other plantations	4
10	Share of homestead in Total land (100%)	57.2
11	Share of homestead in Total land (<25%)	31.6

Source: Field Study 2013-14 in Manimooly Village

The total land under homestead is calculated as 81.8 acres. The average size of homegardens is 0.24 acres. The total number of plant species of about 33 in number looked as if there is a structural diversity in the homegardens of the village. But a close observation reveals that the upper layer feature is only visible here as most of the households prefer perennial crops such as coconuts, mangos and jackfruit than the second layer, third layer or ground layer crops as highlighted by Snehana and others (1992). If we take the total number of crops, in terms of vegetables, fruits, tubers, spices and

plantation crops, on an average 14 types of vegetables, 8 fruit trees, 3 tuber species, 4 spices and condiments and plantations such as coconuts, arecanuts rubber and teaks are seen across the households. The households mainly cultivated in their homestead for home consumption as there is no market for the homestead products. Since the price is determined by the traders, they were unable to sell their products and generate surplus income with which they could buy other items which they do not produce. Such situations demotivate them from utilising their homestead efficiently for cultivating wide varieties of crops and thus maintain the structural diversity of homegardens. This could have preserved the bio-diversity of the village too. But a changing picture is observed in the village. Majority of the household grow coconuts in their homestead and along with it, a few vegetables on their own as a daily activity for almost half-an-hour or one hour per day. The households use simple traditional tools such as spade and sickles for cultivation. The use of organic fertilisers were limited to the households who have livestock rearing. The others mostly prefer to put some other organic manure such as ashes or dried leaves or kitchen wastes as these manures are sufficient for the few crops they are cultivating.

The importance of homestead cultivation to household nutritional and food security in the absence sufficient income from other sources is also seen in the village as 57 percent of the households have only their homesteads to cultivate. An average area of 0.24 acres can actually provide them with sufficient vegetables and fruits, provided they grow these crops. The other category households (32 percent) homestead is just one fourth of their total land area.

Area-wise Allocation of Homestead Crops

An area wise allocation of the crops was computed to know how many households under each category cultivated these crops. After this, the crops are ranked based on the preferences of the households for these crops. The results of this analysis are given in Table 4.

Table 4: The Households (Percentage) Growing Different Crops in the Homegardens: Area-wise Allocation

Sl. No	Name of the Crop	Area (in acres)				Rank
		0.01 to 0.3	0.31 to 0.6	0.61 to 2.0	Total	
1	Coconut	46	14.7	3.6	64.3	1
2	Mango	30.1	12.4	2.9	45.4	2
3	Jackfruit	29.2	12.1	2.7	44	3
4	Plantain	28.9	12.4	2.1	43.4	4
5	Long Beans	19.8	8	1.7	29.5	5
6	Arecanut	13.9	7.4	2.3	23.6	6
7	Curry Leaf	14.5	6.5	0.2	21.2	7
8	Chilli	14.5	5.9	0.5	20.9	8
9	Drumstick	15.6	4.1	0.9	20.6	9
10	Ladyfingers	13	5.9	1.2	20.1	10
11	Teak	9.4	5.9	1.5	16.8	11
12	Papaya	10.6	5	0.6	16.2	12
13	Spinach	8.6	4.1	1.5	14.2	13
14	Slippery Yam	8	3.2	0.3	11.5	14
15	Brinjal	6.8	4.1	0.6	11.5	15
16	Rubber	4.4	3.8	2.7	10.9	16
17	EF Yam	6.5	3.8	0.3	10.6	17
18	Rose apple	6.5	3.5	0	10	18
19	Pepper	9.1	0.3	0	9.4	19
20	Guava	6.2	2.1	0	8.3	20
21	Asiatic Yam	5.3	2.4	0	7.7	21
22	Pumpkin	4.7	2.7	0.3	7.7	22
23	Turmeric	4.4	2.1	0.6	7.1	23
24	Bitter gourd	5.9	0.9	0	6.8	24
25	Tapioca	2.9	3.5	0.1	6.5	25
26	Koval	3.5	2.4	0.3	6.2	26
27	Ash Pumpkin	3.8	2.1	0.3	6.2	27
28	Tomato	3.5	1.2	0.6	5.3	28
29	Ginger	2.1	2.4	0.5	5	29
30	Tamarind	3.24	1.18	0.28	4.7	30
31	Bulls heart	1.8	1.1	0	2.9	31
32	Pineapple	0.9	0.9	0	1.8	32
33	Snake gourd	0.9	0.0	0.3	1.2	33

Source: Field Study 2013-14 in Manimooly Village

An area-wise distribution of crops under each household shows that as the area under homestead increases, the diversity of crops are declining. This means the small and marginal households prefer to grow under homestead more than those who have larger area. This highlights the fact that these households are still dependent on their homestead for the consumption of these crops

because it is expensive for them to buy these items from the market. The households with larger area could be more dependent on market for the consumption of food articles. This might be the reason why they do not venture much into homestead cultivation. Another important finding from the above analysis is that very few households prefer to grow vegetables and spices. The major reason for this is also due to the dependence on outside market for the consumption of vegetables and spices. Market led consumption also explains this pattern of production. This means households prefer to buy from market than produce under homestead.

A large number of households (which varies from 23.4 percent to 63.4 percent of households) have perennial crops grown in their homesteads because of easy maintenance. These perennial crops rank first, in the order coconut, mango and jackfruit at about 64.3 percent, 45.4 percent and 44 percent respectively. The preference for plantain (4^{th} rank) is justified on account of the demand for cheap bananas for home consumption and it commands better price in the market. It also requires less effort in cultivation and maintenance. Thus we see that homesteads with its focus on perennial crops are mostly devoid of great diversity in ground layer crops. Thus one can say that the land use under homestead is not efficient as the area is not utilised well to produce more fruits and vegetables, tubers and spices.

Another important change noticed in the homestead cultivation is the tendency to grow rubber even when the homestead is small. The rubber cultivation is more remunerative and the incentives given by the rubber board and the aspiration to find a regular source of income are some of the reasons for the preference for rubber even in the homestead. The cultivation of rubber destroys the bio-diversity of the place and also affects cattle rearing. Moreover, the households will have to increasingly depend upon market for their food consumption which will affect their food security adversely. Thus preference of the households to grow remunerative crops such as rubber and teak signifies a transition from the traditional homegardens to commercialisation of homegardening.

Occupation-wise Distribution of Crops

The farmers prefer to grow all crops at least in some quantities. The insight and wisdom of farmers to combine many crops along with livestock rearing is remarkable. Their love for farming and their knowledge of the importance of traditional crops still encourage them to cultivate crops such as spinach, papaya, tapioca, curry leaves, beans, fruits and tubers for home consumption despite a depressed market for the traditional products grown under the homestead.

The salaried class stands on equal footing with farmers in their preference to grow mainly perennial crops and along with it various vegetables and tubers. This is because of two reasons. Firstly, they have more land compared to the other categories such as wage earners, or businessmen and those who are depend solely on cattle rearing. Secondly, they are better informed of the problems associated with the imported vegetables as they contain high levels of pesticide and chemical content. The government of Kerala took initiatives to promote the production of vegetables, with the cooperation of students by giving them vegetable seed kits for cultivation after conscientising them about the need to produce vegetables for home consumption.

The households who depend upon remittances and the business income show no interest in cultivating under homestead as they largely depend on market for consumption. The females in their family could very well get engaged in the production of such crops but they prefer to buy than cultivate. This also shows their ignorance about the high nutrition value of these crops and the problems associated with imported food grains and vegetables. The mono-cropping such as cultivation of rubber and teak in homestead is seen across the households since these are more remunerative in nature. Thus homestead also is market determined than need oriented. This is depicted in Table 5.

Table 5: Occupation-wise Distribution of Crops (% of households)

Name of Crops	Agriculture	Agriculture-allied Activity	Wage Earning	Salaried Employment	Business	Gulf Employed	Total
Spinach	27.1	0	16.7	27.1	18.8	10.4	14.1 (48)
Curry leaf	27.8	1.4	13.9	29.2	15.3	12.5	21.2 (72)
Papaya	25.5	1.8	18.2	30.9	9.1	14.5	16.2 (55)
Tapioca	36.4	0	4.5	31.8	13.6	13.6	6.5 (22)
Long Beans	30	0	11	33	14	12	29.5 (100)
Koval	23.8	4.8	4.8	52.4	4.8	9.5	0.06 (21)
Tomato	11.1	0	16.7	44.4	5.6	22.2	5.3 (18)
Ladyfingers	20.3	0	13	40.6	15.9	10.1	20.3 (69)
Drumstick	15.3	1.4	19.4	31.9	15.3	16.7	21.0 (72)
Pineapple	50	0	0	16.7	33.3	0	1.8 (6)
Ashpumpkin	38.1	0	4.8	28.6	14.3	14.3	6.2 (21)
Plantain	23.8	1.4	17.7	30.6	10.9	15.6	43.4 (147)
Bitter gourd	21.7	0	21.7	30.4	8.7	17.4	6.8 (23)
Snake gourd	50	0	0	25	25	0	1.2 (4)
Brinjal	23.1	2.6	10.3	43.6	12.8	7.7	11.5 (39)
Chilli	18.3	1.4	18.3	33.8	12.7	15.5	20.9 (71)
Bulls heart	20	0	0	50	30	0	2.9 (10)
Tamarind	25	6.3	18.8	25	12.5	12.5	4.7 (16)
Ginger	29.4	0	23.5	41.2	5.9	0	5.0 (17)
Turmeric	33.3	4.2	16.7	29.2	8.3	8.3	7.1 (24)
Rose apple	23.5	0	26.5	29.4	11.8	8.8	10.0 (34)
Guava	14.3	3.6	7.1	35.7	25	14.3	8.3 (28)
Pumpkin	15.4	0	15.4	34.6	15.4	19.2	7.7 (26)
Pepper	35.3	0	14.7	29.4	14.7	5.9	10.0 (34)
EF Yam*	33.3	0	8.3	44.4	5.6	8.3	10.6 (36)
Slippery yam	30.8	2.6	10.3	28.2	17.9	10.3	11.5 (39)
Kachil	34.6	0	7.7	42.3	7.7	7.7	7.7 (26)
Rubber	29.7	2.7	18.9	32.4	8.1	8.1	10.9 (37)
Coconut	18.3	0.5	24.8	27.1	13.8	15.6	64.3 (218)
Arecanut	23.8	1.3	20	31.3	12.5	11.3	23.6 (80)
Mango	27.9	0.6	16.9	29.2	14.3	11	45.4 (154)
Jackfruit	29.5	1.3	16.8	32.2	12.1	8.1	44.0 (149)
Teak	29.8	1.8	15.8	29.8	17.5	5.3	16.8 (57)

Source: Field Study 2013-14 in Manimooly Village

Figures in parentheses are number of households who grow the crops

* Elephant Foot Yam

The Crop-Livestock Integration in the Homestead Cultivation

The homegardens in Kerala is very often said to combine crops with livestock rearing which ensures productivity, enhance nutritional status and augment farm income and help to reduce dependence on inorganic chemical fertilisers and help to maintain soil health through organic recycling (Salam *et al,* 1995). The total number of livestock in the village and across the occupational distribution shows that the livestock rearing is done by a few farm families and wage earners. Thus number of livestock such as cow, buffalo, goat and rabbit is very less. The households as a whole tend to rear poultry. This could be due to changing consumption habit of people from vegetable to meat and egg. The details of livestock rearing in the village are given in Table 6 and Table 7.

Table 6: Animal Stock of the Village Household

Particulars	Number	Percentage of Households
Cow	71	10.0
Buffalo	5	0.8
Poultry	421	32.2
Goat	54	4.7
Rabbit	12	1.4

Source: Field Survey 2013-14

Table 7: Occupation-wise Distribution of Animal Stock in the Village

Percentage of Households with Different Animal Stock

Sl. No.	Major Occupation	Cow & Buffalo	Poultry	Goat	Rabbit	Total
1	Agriculture	63.9	30.1	58.8	60.0	71 (20.9)
2	Agriculture-allied Activity	2.8	1.7	5.9	0.0	4 (1.2)
3	Wage Earning	16.7	18.1	11.7	20.0	30 (8.8)
4	Salaried Employment	11.1	27.5	17.6	0.0	39 (11.5)
5	Business	0.0	13.7	5.8	20.0	18 (5.3)
6	Gulf Employment	5.6	8.6	0.0	0.0	12 (3.5)
7	Total	100.0 (36)	100.0(116)	100.0 (17)	100.0 (5)	51.3 (174)

Source: Field Survey 2013-14

From Tables 6 and 7, the following inferences could be drawn. The farmers in the village practise a crop livestock integrated system of cultivation to some extent. Such farmers utilise their time and energy to cope with their low income as they do not have other sources of income. The cows, goats and poultry are a major supplementary source of income other than crop production besides meeting the home demands for milk, egg and meat. Besides this, the organic manures from these livestock maintain and sustain the soil nutrients which are essential for the production of other crops under homesteads.

From the above analysis of the characteristics of the homestead cultivation, we can see that the structural and functional diversity of homegardens and the crop livestock integration in the homegardens, one of the traditional features of homegardens in Kerala, are missing in the study area.

Rather a commercialised pattern of cultivation, largely driven by market, dominates the homesteads. Thus a monoculture is observed in homestead than a structural diversity. In the present socio-economic conditions, this raises the question as to whether homegardens are becoming irrelevant (Kumar and Nair, 2004) in the present study too.

Production, Consumption and Marketted Surplus of the Crops from Homesteads

The crops grown in the homesteads are broadly classified into food grains, vegetables, tubers, fruits, spices and condiments, coconuts and other non-food trees.

Food Grains in the Homestead

The people in the village had grown paddy extensively in the immediate surroundings of their homes in the initial years as they migrated to the village to sustain their lives (from 1940s till early 1980s). Paddy and tapioca were the major food items then. But now the land use has undergone such a dramatic change that paddy cultivation has completely disappeared. The paddy field has been converted for the cultivation of coconut and arecanut and also to construct houses. The increasing cost of production in the wake of high labour cost and lack of availability of labour has made paddy production unattractive. Moreover, the cheap supply of rice through PDS for consumption discouraged production. The consumer friendly policies such as these, without catering to the problems of the primary producers, compelled them to change their area under food crops such as paddy to more remunerative crops like coconut and arecanut. The farmers who have grown food grains were encouraged to sell the land than to cultivate. All these have brought out severe consequences of land-use change in the village. Such change in the land use also has its bearing on the production of food crops such as pulses, sugar and vegetables, tubers and spices. The major fallout of the disappearance or conversion of wetlands is manifested in the loss of numerous ecosystem services and other environmental problems such as water logging.

The Vegetables Cultivated in the Homesteads

The major vegetables grown and their average production, consumption, average market value of self-consumption and the total marketed surplus are given in Table 8.

Table 8: Annual Production, Consumption and Marketed Surplus of Vegetable Grown in the Homestead

Sl.No.	Name of the crops	Average Production (kg)	Average consumption (kg)	Average Market Value of self-consumption (Rs.)	Marketed Surplus (Rs.)
1	Spinach	4.2	4.2	42.3	0
2	Curry leaves	2.0	2.6	61.0	0
3	Tapioca	80.8	55.4	1107.3	11200
4	Beans	6.7	6.7	201.5	0
5	Ivy gourd (Koval)	26.0	26.0	650.0	0
6	Tomato	8.2	7.1	107.1	277.5
7	Ladyfingers	3.5	3.5	34.7	0
8	Drumstick	3.3	3.3	132.3	0
9	Bitter gourd	4.3	4.3	108.2	0
10	Snake gourds	24.3	4.3	85.0	1600
11	Brinjal	9.4	9.4	140.4	0
12	Pumpkin	12.2	12.2	121.5	0
13	Ash pumpkin	11.7	11.7	140.6	0
14	Chilli	2.8	2.8	139.1	0

Source: Field Survey 2013-14.

Since the preference for vegetable cultivation is very low compared to other crops, the average production of most of the crops is below 10kg. In case of tapioca, ivy gourd and snake gourd, few farmers (<10 percent) cultivate these crops. The average production of all vegetables is 199 kg and average consumption of vegetables is 154 kg. All the vegetable crops are mainly grown for home consumption. It also reveals that since the households grow very few quantity of each crop, it cannot make a market surplus. In the case of tomato, snake gourds and tapioca, only very few farmers cultivate it. Since they cultivated more than they need for home consumption, they were able to make some surplus for sale and generate income. While taking into consideration the average market value of self-consumption, the households are able to reduce their consumption expenditure on these items and were able to save their income. But much more than saving their income, the fact is that they are able save their lives from consuming highly polluted vegetables from the market.

The Tubers in the Homesteads

The similar pattern is observed in the case of tubers too. The tubers are nutritionally essential, traditionally grown staple food grown in Kerala. Despite its rich role in health enhancement, tubers in homegardens have come under great pressure because of the dynamics of new agrarian structure and shifts in cropping patterns. This has led to increased market dependence of the households and adversely affected their food security. However, the preference for these crops by a few households is still praiseworthy. The production and consumption pattern of tubers are given in Table 9. These crops yield is reported to be much high compared to other crops in the study area. However, the low

production is recorded due to the attack of rats and monkeys. This also discourages the households from growing tubers.

Table 9: Annual Production, Consumption and Marketed Surplus of Tubers Grown in the Homestead

Sl. No.	Name of the crops	Average Production (kg)	Average consumption (kg)	Average Market Value of self-consumption (Rs.)	Marketed Surplus (Rs.)
1	Elephant foot Yam	20.4	20.4	204.2	0
2	Taro (Chempu)	6.0	6.0	150.0	0
3	Asiatic Yam (Kachil)	12.2	12.2	243.1	0

Source: Field Survey 2013-14

The Fruits and Spices

A wide variety of fruits could be grown in homesteads. The present study reported about eight species of fruits with a scattered preference. Hence the average production is flimsy. Households prefer to grow mostly the plantain as it gives them a good income. The fruits such as mango and jackfruit, though produced by more than half of the households, are largely wasted at the time of harvest due to labour scarcity and home consumption. Hence its marketed surplus is very low compared to plantain. However, these crops satisfy the need for organic manure for coconut and other crops. The other fruits like custard apple and rose apple are not available in the market and so there is no market for these crops. Hence, the few people who have these trees in their homesteads just keep it as it is. The production of papaya, guava and pineapple also is very small due to the lack interest. The dependence on market for the consumption also could explain this phenomenon. Details are given in Table 10.

Table 10: Annual Production, Consumption and Marketed Surplus of Fruits Grown in the Homestead

Sl. No.	Name of the crops	Average Production	Average Consumption (in kg)	Market Value of self-consumption (Rs.)	Marketed Surplus (Rs.)
1	Papaya	20.4	20.4	203.6	0
2	Custard Apple	6.3	6.3	157.5	0
3	Pine Apple	5.0	5.0	150.0	0
4	Rose Apple	16.4	16.4	163.8	0
5	Guava	4.9	4.3	86.4	340
6	Plantain	73.2	52.0	1300.0	77950
7	Mango	67.6	64.8	1620.6	10750
8	Jack fruit (nos)	38.1	36.6	549.4	3300

Source: Field Survey 2013-14

The spices such as tamarind, ginger, turmeric etc. are ground layer crops whose market value is very high compared to all other crops. But still no interest is shown in the cultivation of these crops

too. Hence the production is very low. The change in attitude of the households to a market-led culture with increase in standard of living could be reason for such negligence. The ignorance of the high medicinal value of these crops is also evident. Table 11 shows the pattern of production, consumption and marketed surplus of spices.

Table 11: Annual Production, Consumption and Marketed Surplus of Spices and Condiments Grown in the Homestead

Sl. No.	Name of the crops	Average Production (kg)	Average consumption (kg)	Market Value of self-consumption (Rs.)	Marketed Surplus (Rs.)
1	Tamarind	5.9	5	1000.0	3000
2	Ginger	11.7	11.7	588.2	0
3	Turmeric	12.0	12.0	963.3	0
4	Pepper	2.9	2.7	1164.7	1600

Source: Field Survey 2013-14

The Coconuts and other Non-food Trees

Coconut-based farming system is a time-tested practice in Kerala with large variety of crops grown in interspace in coconut gardens (John, 2014). But looking at the present system, the coconut has become largely a monocrop as its interspace is not sufficiently utilised for growing vegetables, fruits or spices as is examined above. The perennial crops such as coconut, arecanut and rubber are said to be intensively managed crops (Peyre *et al*, 2006). The preference of the households to cultivate only these crops is because of less attention required. Secondly, it brings regular income to the households. The crop such as coconut is helpful to the family in many ways. It is mainly used as a food crop. Sufficient amount of money can be saved by the households by way of oil and buying coconuts for daily cooking. On an average, the households consume about 473 coconuts in a year. And the average market value of coconut self-consumption is also very high (Rs.31552 per year). Coconut production also generates sufficient marketed surplus as it has demand in the market. The other crops such as arecanut and rubber are highly commercialised crops and bring high and regular income to the households. Hence, they prefer to grow these crops even under homestead. Total marketed surplus for rubber is the highest (Rs.10.8 lakh per year). This type of land use change in the homestead reveals that even the homestead production is largely market determined.

Table 12: Annual Production, Consumption and Marketed Surplus of Coconut and Other Non-Food Trees in the Homestead

Sl. No.	Name of the crops	Average Production (kg)	Average consumption (kg)	Average Market Value of self-consumption (Rs.)	Average cost (Rs.)	Average income (Rs.)	Marketed Surplus (Rs.)
1	Coconut (in nuts)	700.6	472.9	31552.7	1385.0	6964.3	330933.3
2	Arecanut	87.8	0.0	0.0	443.6	2702.1	210600.0
3	Rubber	196.4	0.0	0.0	5210.8	23364.9	1089900.0

Source: Field Survey 2013-14

Thus there is a transition in the land use under homestead from large varieties of crop cultivation to a single crop. And this monoculture is market driven. Also one can claim that the government initiatives to grow more fruits and vegetable have not been spread to all the villages.

The Value of Homestead crops in Total Consumption Expenditure

The share of homestead crops in the average annual consumption expenditure of the households shows that it contributed very little to the total consumption expenditure. But comparatively high contribution is made by coconut as the households were able to make edible oil with coconut and reduce the consumption of oil. The fruit production, especially plantain, contributes about 27 percent of the average annual consumption expenditure of the household. Thus homestead crops supplement households' consumption expenditure. The vegetables satisfy only 3 percent of the demand of the households. A kind of consumerism is reflected in their consumption pattern because of which instead of cultivating these vegetables they prefer to spend on an average Rs.9445/- per year for the purchase of these crops. The analysis of homestead products consumption in the total consumption expenditure is depicted in Table 13.

Table 13: Share Value of Home consumption of Crops from Homestead in the Total Consumption Expenditure

Crops	Total Consumption Expenditure (Rs./year)	Average Consumption (Rs. Spent/year)	Total Value of Consumption from homestead (Rs./year)	Average Value of Consumption from homestead (Rs./year)	Percentage share of self-consumption from homestead
Vegetables	3201924	9445.204	102292	301.7	3.1
Fruits	1994076	5882.23	544270	1605.5	27.3
Edible Oil	1597848	4713.416	687293.3	2027.4	43.0

Source: Calculated from Field Survey 2013-14.

Considering the importance of homestead cultivation in bringing about food security, it is important to analyse the constraints faced in homegardening in Kerala.

The Constraints and Opportunities in Homestead Cultivation

Land reforms, i.e. the agrarian reform measures of the government since 1960s and 1970s, were to bring about a change in ownership of land to address the problem of agricultural development in terms of social justice and economic returns. The reforms assured land to the landless and also to the tenants who became the tillers of the soil. The private proprietorship on land was to boost agricultural production employing the family labour efficiently. The small plots given to the landless agricultural labourers as homestead have been found to provide assured food and nutritional security and the probability to bring income to the household through the cultivation of large varieties crops using family labour. Thus everyone got an opportunity to cultivate in their homesteads. However, the homestead production as a sub system of the entire agricultural system suffered due to the overall decline in crop production. The major constraint faced was that the homesteads given to the agricultural labourers were very small which could neither produce enough for the sustenance of the family nor could generate income. The labourers were still dependent on the large and small holders for cultivation. However, passing of the wage bill forced the large and small holders of land to opt for labour saving technology. Thus employment in agriculture was reduced. Hence the labourers started looking out for employment elsewhere and this has brought about labour scarcity in farms. As a result, those who have land and wanted to produce under homestead couldn't do so because of labour scarcity. For example, the cultivators needed labour for harvesting tree crops and coconut which cannot be done using family labour. Skilled labourers are essential for it. Lack of labour availability further increased the cost of cultivation. Added to this the supply of rice through PDS brought about an assured supply of food grains at a cheaper rate. This made one class of people dependent on PDS, while another class such as producers of food grains and vegetables stopped growing crops. Such a situation had an effect on the overall production in Kerala and also on the homestead cultivation. The initial dependence on public distribution system rather than production, slowly gave way to depending on market for consumption as the standard of living increased.

The second major constraint is related to the land-use change which took place in the village as a result of gulf migration and the resultant remittances. Those who were employed in the Gulf found land a safe and sound investment. Land began to be considered as a speculative asset. The commodification of land in terms of purchase and sale largely influenced the land-use change. This has brought about a change in ownership of land from farmers to those who are not interested in farming. Moreover, the increasing conversion to housing plots as a result of the investment in land took away major chunk of homestead land away from cultivation. The housing boom in the study area as a result of the gulf remittances created more house plots and led to increased fragmentation of holdings. The opportunity that could be tapped in this phase was that there had been increase in the prices of fruits and vegetables in the market. Had the gulf migrants invested their money in agricultural production, it would have created a market for these products and would have encouraged others to grow the crops even in their homesteads. Since such a situation never arose in the village, large part of the income was spent on buying goods rather than producing them.

Moreover, there was no incentive to grow vegetables and fruits and spices in the homestead as these indigenous homemade commodities does not command good price in the market.

Marketing of the crops was another constraint faced by households in homestead cultivation. This has resulted in negligence of these crops. However, households generously responded to the cultivation of rubber as its cultivation is subsidised by the government and it fetches more income. The mono-cropping of coconut, arecanut and rubber are mostly market driven which has resulted in a land-use change, affecting environment and food security of the state.

When remittances shot up the prices of fruits and vegetables, the homestead production which is socially acceptable and environmentally sound could have been augmented. However, the ignorance of households regarding the high nutrition and medicinal value of crops posed another constraint in the production of these crops under homestead. An awareness of the side effects of consuming the highly poisonous vegetables imported from neighbouring states could have rejuvenated homestead cultivation to some extent. Such awareness created through newspapers was not sufficient enough to bring about the change. This also reveals that there was no effective media information regarding this.

The decentralised governance could have addressed many issues related to the homestead cultivation such as efficient employment of manpower in the village to produce more and efficient utilisation of homestead area by providing vegetable seed kits, saplings and providing tools for its production. But this was sorely lacking in the study area as there were no organised cultivation of crops or efficient manpower utilisation. As a result, the quantum of homestead land was further reduced in the village when the demand for house plots went up because of rising population and inflow of Gulf money. As a result, there was wide-spread destruction of homestead trees. There has been increasing underutilisation of the newly-created plots of the non-farm households.

Major Conclusions and Policy Implications

The study has mainly looked into the nature of homestead farming, its importance, opportunities and major constraints. The study found that homestead farming was not done in an organised way in the study area. The households prefer to grow a perennial crop which needs less care and labour saving due to the crisis of labour in farmland. There is also a transition towards mono-cropping pattern observed in the village. The economic value of the crops in the market is driving the use of homesteads. This is reflected in the selection of crops such as coconut, arecanut, rubber and teak. On the whole, the structural diversity that had existed in the traditional homegardens is not seen in the village. The mono-cropping pattern and underutilisation of homestead area coexist in the study area. The major constraints faced in the cultivation of homegarden are the lack of interest in producing under homestead and market-led consumption pattern. This could probably be due to the ignorance of the households of the high nutritious value of homestead products. The labour scarcity in harvesting tree crops such as mango, jack fruit, coconut etc. leads to wastage of huge chunk of fruits and neglect of these crops. The incentives for the production and marketing of these crops for those wanted to sell their surplus is highly inadequate. Thus even the Gulf money is not invested in cultivation but in land. This investment of Gulf money has spurred a land market for real estate in the study area. As a result of this, there is a housing boom and consequently, a decline in the size of homestead area and

destruction of homestead tress. This has created a loss of bio diversity and other environmental problems.

The importance of home-gardening cannot be undermined as it is an asset to the household in preserving the health of its members. Its medicinal and nutritional value enhances the development of human capacities and capabilities. The agricultural landscape and ecology is highly essential for sustainable development. There is a scope even now for the development of agriculture that can generate employment and can arrest the export of its manpower to other nations. Homestead cultivation can address the problem of food security within household level. If the constraints are taken seriously, it can bridge the production-consumption gap which should be the major concern of the government. So the state needs to direct its attention to the ways in which homestead cultivation could be rejuvenated on a large scale covering all Panchayats on an equal basis for the better utilisation of homestead area, in generating surplus from homesteads and thus maintain the health of both human and natural resources. If one section of people converts the land for better economic return, another section with sufficient time, especially women, can concentrate on homestead cultivation if the cost of devoting time on homestead cultivation is not so high. The Panchayat can solve the problem of shortage of labour very efficiently if it organises its labour, conscientise them and make them available for those who undertake production. The women employment under homestead should be promoted to get rid of the problem of unemployment among women as in the village, women are mostly dependent and not employed.

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Appendix 1

Table 1: Distinction between Homegardens Agriculture and Commercial Agriculture

Characteristics	Home garden agriculture	Commercial agriculture
Holding size	Extremely small; maximum size < 1 ha	Larger
Major objective	Meeting home demand (food, fodder, fuel, timber, organic mulch, medicines)	Income generation by sale of produce
Resource use level	Intensive	Extensive
Labour use	Mostly family, supplemented by hired labour	Mostly hired
Species diversity	High	Low
Nature of cropping	Polyculture	Single crops
Integration of farm enterprises	High	Low
Organic and nutrient cycling	High	Low
Dependence on market-purchased inputs	Low	High
Nutritional security of household members	High	Low
Environmental sustainability	High	Low
Market linkages	Poor	Well developed

Source: Salam *et al*, 1995.

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