International Journal of Forestry and Horticulture (IJFH)
Volume 9, Issue 1, 2023, PP 33-49
ISSN No. (Online) 2454–9487
DOI: http://dx.doi.org/10.20431/2454-9487.0901004
www.arcjournals.org

Floristic Composition of Home Gardens and their Role in the Livelihood of the People of Kumba Municipality, Southwest Region, Cameroon

Njoh Roland Ndah [1,2*] Julie Taku[1], Celestine Fonyikeh-Bomboh Lucha[4] , Mbah Harry Agwa[3], Sirri Maryline Neba[1]

[1]*Department of Agriculture, Higher Technical Teachers Training College (HTTTC), Kumba, P.O. Box 249, Kumba, University of Buea, Cameroon.*
[2]*Forests, Resources and People, Limbe P.O Box 111 Limbe, Cameroon*
[3]*Departmen of Agriculture and applied molecular sciences, University of Buea, Cameroon*
[4]*Department of Plant Biology, University of Dschang, P.O. Box 67, Dschang, Cameroon*

Corresponding Author:** ***Njoh Roland Ndah, *Department of Agriculture, Higher Technical Teachers Training College (HTTTC), Kumba, P.O. Box 249, Kumba, University of Buea, Cameroon.*

Abstract: *Information on species diversity in home garden is scanty as most attention is focused on cash crops production for exports. The main objective of this study was to contribute to knowledge on the specie composition of home gardens and the role it plays in livelihoods of home garden owners in Kumba Municipality. A purposive sampling technique was used to select respondents for the study area. Seventy (70) well-structured questionnaires were established in the three zones. Zone 1(Lower Meta quarter block 1), zone II (Upper Meta quarter block 2) and zone III (Kumba town) for the collection of socio-demographic data and home garden information. For vegetation data collection, quadrats of 10x10m were established to collect all tree species. Trees were measured at DBH 1.37 using a diameter tape while for herbs, climbers and creepers quadrats of 2x2m were established in all plots. Shrubs, herbs, climbers and creepers were counted in all the plots. Diversity indices were calculated and analyzed using excel and SPSS version 22.0. Descriptive statistical such as frequency tables, pie and bar charts were derived. Results revealed that females who are of the middle aged 30-40 and 50 years above who are married with some level of education having as occupation trading dominated across the study sites. Also, they mostly have a house hold size of 4-7 persons. Trees, herbs, climbers, shrubs and creepers are the main plant species recorded across sites. A total of 86 useful plants species with a total of 46 families were reported during plant inventory. Species richness, abundance, number of genera, number of families and Shannon index of trees species showed significant differences ($P < 0.05$) across zones. Socially, economically and environmentally home garden plays major role in the livelihoods of the farmers. The main role was for food (29%) closely followed by medicine and income (12%) respectively and the least wind breaks (3%) to protect their houses and some home garden crops expose to wind action. Management activities of home gardens were mostly carried out by women who are busy to plant, weed, mulch, thin, fertilize, harvest and market the produces from garden. Majority of the respondents across the study sites faced challenges of destruction by domestic animal, pest and disease infestation, theft, climate change, small size of home garden areas, lack of improved seeds, seedlings failure, and lack of extension agents. It was recommended that government should facilitate the acquisition of land especially to women and subsidize farm inputs and also ensures regular visit of extension agents.*

Keywords: *Floristic composition, species diversity, livelihoods, home garden.*

1. INTRODUCTION

1.1. Background of the Study

Sustainable conservation is receiving increased attention from the world's scientists and leaders in recent decade, because of the growing recognition of its importance and the adverse impacts of climate change particularly genetic diversity [1].The alarming situations have been the cases of clearing of natural ecosystems and land degradation due to unsustainable agricultural practices. These anthropogenic activities are becoming threats to the sustainability and productivity of the ecosystems [2]. Most of these indigenous people live in close proximity with these natural resources which they obtained their goods and services. These goods and services play major roles as most of these communities totally depend on for their livelihoods [3].

Most developmental works such as expansion of agro-industries, mining, infrastructural development etc., are done with limited participation of most indigenous people. Often little information are gathered from these inhabitants and decisions are taken at higher levels for project conception and implementation, sometimes the results are destruction of habitats, niches destroyed and most species are rendered threatened others get to extinction [4]. Most of the indigenous people are left wanting on managing their livelihoods.

A vast majority of hungry and malnourished people live in developing countries under sub-standard living conditions [5] and over half a billion of the global population suffer from chronic food insecurity therefore, there is a continuous need to increase food production and buffer stocks to meet the growing demand. Moreover, the needs for interventions are stressed as the resources available for food production including land, water, labour and credit are becoming scarce and costly.

Multiple strategies are required to address the issue of food production and food securities which home gardens fall amongst them.

Home gardens are basic production units contributing to ecological, social and cultural well-being in rural areas [3]. These units are becoming dominant and promising land-use system in many parts of the tropics including Cameroon in maintaining high levels of diversity, productivity, and sustainability endowed with important ecosystem functions [7]. Home gardens play a critical role in meeting the goals of food security, poverty alleviation, and sustainable agriculture, particularly among smallholder farmers in developing countries [8]. Yet the complimentary role it plays in ecosystem goods and services have been less echoed in areas of restoration and management of ecosystem.

2. Materials And Methods

2.1. Description of the Study Site

This study was conducted in Kumba (Figure, 1) a metropolitan city found in the Meme Division, in the South West Region of Cameroon. It originated from the Bafow word 'Kumbè', meaning an umbrella tree. Its Motto is: "The Green City" and it is, commonly referred to as "K-town". It coordinates 4°38’7’’ N and 9°26’57’’ S and it is characterized by a mono-modal semi humid forest agro-ecological zone marked by two distinct seasons; a long rainy season extending from March to November and a short dry season [9]. The mean annual rainfall varies between 2500mm to 3250mm [9]. This area is hottest from February to March with highest rainfall between the months of July to October with a minimum temperature of 21 0C. There is also the presence of strong winds during the rainy season. Annual temperature variation is 25°C [9]. It is the largest city in the Meme division and a hop for most businesses. It has an estimated population of about 400,000 inhabitants [10]. Most major roads to the nearby villages start at Kumba, running to the Nigerian border at Mamfe, the Korup National Park at Mundemba, and Mount Koupe to the east.

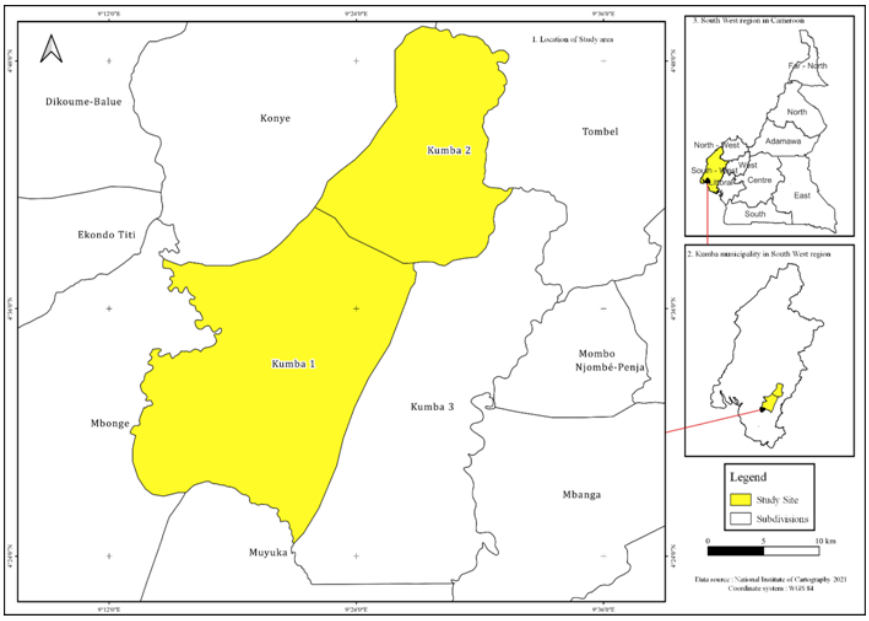


Figure1. *Map of Kumba with the study sites [11]*

2.2. Population of the Study Sites

The study population was made up of men and women of age 20 years and above, who are owners of home gardens. At the beginning of the study, a reconnaissance survey was carried out in January 2023 which included: transect walk, formal and informal conversations were carried to know the suitability of the area to meet the objectives of research. Overall information on the study areas were obtained and representative sampling sites were identified by consulting the quarter heads and the elders of the respective sites in Kumba municipality.

2.3. Sampling Technique and Sample Size

The study zones were identified using a purposive sampling technique. The Krejcie and [12] table was used in determining the sample sizes from the respective population as shown on table 1. Based on the table, the sample size for zone I was 278, 265 for Zone II and 248 for zone III. However, the effective sample size was 30 for zone I, 30 for Zone II and 40 for Zone III with a total of 100 respondents for the study. Some of the reasons for a drop in the sample size were: insecurity, taboos, reluctant in participation in the exercise, acessability etc

Table1. *Sample size determination using [12]*

Zone	Population(n)	Calculated sample size	Effective sampling size
Zone I (meta quarter 1)	501	278	30
Zone II (meta quarter 2)	503	265	30
Zone III (Kumba town)	700	248	40

2.4. Data Collection Procedure

Questionnaires were administered to males and females who owned and managed home garden in Kumba Municipality.

2.5. Primary Data Collection

Primary data were collected using a semi structured questionnaire with open and close ended questions. The questionnaires were divided into 5 sections to capture the characteristics and attributes of the respondents. Section A: was made of the socio demographic characteristics of the people practicing home gardens. Section B, species diversity and composition of the different plant forms. Section C: role of home gardens in the livelihoods of the indigenous people of Kumba municipality, Section D: management practices of home garden and Section E constraints of home garden farmers. All data for this study were collected with the help of household heads (HH) and in their absence any member of the household who participated in the management of home garden was used.

2.6. Secondary Data Collection

Secondary data was collected from scientific publications, electronic documents (internet), and documents in the Library of the Kumba city council Meme Division.

2.7. Plant Inventory

For vegetation data collection, 10 home gardens were selected randomly in each zone of the study sites giving a total of 30 home gardens across sites. For sampling of trees, quadrats of 10x10m were established in each of the home garden randomly selecte\d as described by [13]. Trees diameters were taken at breast height (DBH 1.37m) using a diameter tape and heights were measured by super imposing range poles on tree stem to the top of the tree. For shrubs, herbs and climbers 2x2m quadrats were randomly established in four sides of the plot as described by [13]. All shrubs, herbs and climbers within the quadrats were counted and recorded. The local names, scientific names, the uses of the plants were all recorded. Unidentified plants were pressed dried and taken in triplicate to the Limbe Botanical Garden for identification.

2.8. Data Analyses

Questionnaires analysis

Questionnaires were checked for completeness, numbered and responses entered in to SPSS Version 21.0 statistical package. For question with multiple possible responses (tick all that apply question), two approaches were used. Firstly, the multiple responses were transformed to enable counting of

multiple responses. Secondly, the multiple response option was used to group possible responses in to main variables. Binary coding was used for all responses. Data were subjected to descriptive statistical analyses. The results were presented in a summarized form using means, percentages, tables and graphs. One way analysis of variance was used to separate means using statistical soft ware SPSS version 21.

Vegetation analysis

Frequency, density, basal area, abundance and richness of plant species in home garden were calculated following [14] and [15]. The basal area of each individual tree shrubs and climbers in home garden species were calculated following

$$BA = pi\ (1/2\ DBH) \quad (1)$$

The importance value index (IVI) for trees, shrubs and climber in home garden were calculated by summing their relative frequency, relative density and relative dominance. The species diversity indexes were calculated following the Shannon-Wiener index, where:

$$H' = -\Sigma\ (ni/N)\ \ln ni/N \quad (2)$$

Where H' = Shannon- Wiener index of general diversity, ni = importance value index of i^{th} species, N=sum of importance value index of all the species.

3. RESULTS

Table 2 presents the gender, age group, and marital status of the respondents. With respect to gender, a majority of the respondents (62.90%) across the study sites were female while the rest (37.10%) are male. Cross tabulation across the zones shows that in Zone I (17.50%), Zone II (19.60%) and Zone III (25.80%) female respondents were more represented than male. Of all the respondents in the study site irrespective of gender, a majority (39.2%) were from Zone III while the least represented zone was Zone I (29.9%).

With respect to age group, a majority of the respondents were of the age group 31- 40 and 50 years and above with each having (27.70%) while the least represented was the age group 20-30 (19.10%). In Zone I, the age group 31- 40 (11.70%) was the most represented while the least was the age group 50 years and above (3.20%). In Zone II, the age group 50 years and above most represented with 11.70% while the least represented was the age group 20 -30 (4.30%). Zone III, the age group 50 years and above was most represented with 12.80%, while the least represented was the age groups 20-30, 31-40, 1-50 where each had 8.50 % respondents.

Lastly with respect to marital status of the respondents, a majority of the respondents were married (64.80%) while the least represented was divorced (12.50%). In Zone I, those married (23.90%) were the most represented while the least was divorced (1.10%). In Zone II, those who are married (21.60%) were the most represented while the least represented were single and divorced (5.70%). |In Zone III, married respondents were most represented (19.30%), while the least represented was divorced (5.7%).

Chi square test of association between the zones and gender ($p = 0.833$) and between zones, age group ($p=0.281$), and marital status ($p = 0.403$) shows that there is no significant association ($p>0.05$) between the zone and the measured parameters.

Table2. *Gender, age group and marital status of respondents across zones*

Parameter		Percent Frequency	Zone			Total	χ2	p-value
			Zone 1	Zone II	Zone III			
Gender	Male	Frequency	12a	11a	13a	36	0.366	0.833
		% of Total	12.40%	11.30%	13.40%	37.10%		
	Female	Frequency	17a	19a	25a	61		
		% of Total	17.50%	19.60%	25.80%	62.90%		
	Total	Frequency	29	30	38	97		
		% of Total	29.90%	30.90%	39.20%	100.00%		

Age group	20-30	Frequency	6a	4a	8a	18	7.458	0.281
		% of Total	6.40%	4.30%	8.50%	19.10%		
	31-40	Frequency	11a	7a	8a	26		
		% of Total	11.70%	7.40%	8.50%	27.70%		
	41-50	Frequency	9a	7a	8a	24		
		% of Total	9.60%	7.40%	8.50%	25.570%		
	>50	Frequency	3a	11b	12b	26		
		% of Total	3.20%	11.70%	12.80%	27.70%		
	Total	Frequency	29	29	36	94		
		% of Total	30.90%	30.90%	38.30%	100.00%		
Marital status	Married	Frequency	21a	19a	17a	57	4.022	0.403
		% of Total	23.90%	21.60%	19.30%	64.80%		
	Single	Frequency	7a	5a	8a	20		
		% of Total	8.00%	5.70%	9.10%	22.70%		
	Divorced	Frequency	1a	5a	5a	11		
		% of Total	1.10%	5.70%	5.70%	12.50%		
	Total	Frequency	29	29	30	88		
		% of Total	33.00%	33.00%	34.10%	100.00%		

Table 3 presents the religion, household size, and level of education of the respondents. With respect to religion, a majority of the respondents (97.50%) across the study sites are Christians while the rest (2.50%) are Muslims. Cross tabulation across the zones shows that in Zone I (35.00%), Zone II (25.00%) and Zone II (37.50%) Christian respondents were more represented than Muslim.

With respect to household size, a majority of the households had 4-7 members (37.10%) while the least represented was household size 11-13 (6.20%). In Zone I, household size 4-7 (14.40%) was the most represented while the least was household size 11-13 (2.10%). In zone II, Household size 7-10 was most represented with 11.30% while the least represented was household size 11-13 (3.10%). In Zone III, the household size most represented was both 1-3 and 4-7 with each having 13.40%, while the least represented was household size 11-13 (1.00%).

Lastly with respect to Level of education, a majority of the respondents had GCE O/L (28.10%) while the least represented was Ph.D. (1.00%). In Zone I, those who had GCE O/L (10.40%) were the most represented while the least was First degree (1%). In zone II, those who had GCE O/L and GCE A/L were most represented with 7.30% while the least represented was Masters (2.1%). In Zone III, the level of education most represented was GCE O/L (10.40%), while the least represented was PhD and Masters (1.00%).

Chi square test of association between the zones and religion ($p = 0.542$) and between zones, Household size ($p=0.410$), and Level of education ($p = 0.451$) shows that there is no significant association between the zones and the measured parameter

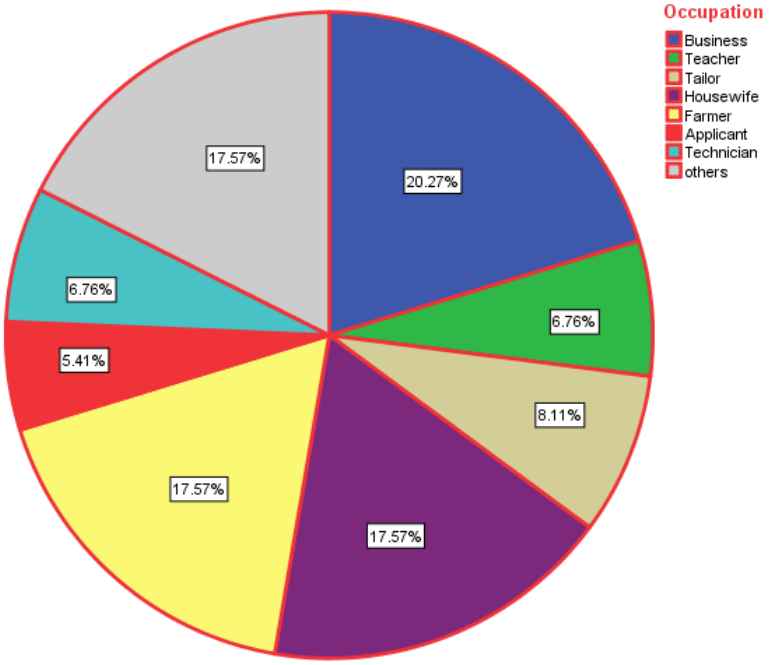
Table3. *Religion, Household size, and Level of education of the respondents*

		Zone			Total	X2	P - value
		Zone 1	Zone II	Zone III			
Religion							
Christianity	Count	28a	20a	30a	7	1.226	0.542
	% of Total	35.00%	25.00%	37.50%	97.50%		
Islam	Count	0a	1a	1a	2		
	% of Total	0.00%	1.30%	1.30%	2.50%		
Total	Count	28	21	31	80		
	% of Total	35.00%	26.30%	38.80%	100.00%		
Household size							
01-3	Count	8a	5a	13a	26	6.116	0.410
	% of Total	8.20%	5.20%	13.40%	26.80%		
04-7	Count	14a	9a	13a	36		

	% of Total	14.40%	9.30%	13.40%	37.10%		
07-10	Count	6a	11a	12a	29		
	% of Total	6.20%	11.30%	12.40%	29.90%		
11-13	Count	2a	3a	1a	6		
	% of Total	2.10%	3.10%	1.00%	6.20%		
Total	Count	30	28	39	97		
	% of Total	30.90%	28.90%	40.20%	100.00%		
Level of education							
No certificate	Count	5a	2a	8a	15	11.939	0.451
	% of Total	5.20%	2.10%	8.30%	15.60%		
FSLC	Count	7a	5a	4a	16		
	% of Total	7.30%	5.20%	4.20%	16.70%		
GCE O/L	Count	10a	7a	10a	27		
	% of Total	10.40%	7.30%	10.40%	28.10%		
GCE A/L	Count	6a	7a	8a	21		
	% of Total	6.30%	7.30%	8.30%	21.90%		
First degree	Count	1a	6b	6a, b	13		
	% of Total	1.00%	6.30%	6.30%	13.50%		
Masters degree	Count	0a	2a	1a	3		
	% of Total	0.00%	2.10%	1.00%	3.10%		
PhD	Count	0a	0a	1a	1		
	% of Total	0.00%	0.00%	1.00%	1.00%		
Total	Count	29	29	38	96		
	% of Total	30.20%	30.20%	39.60%	100.00%		

3.1. Occupation of the Respondents across the Study Site

Figure 2 shows the distribution of respondents across the study site with respect to their occupation. The majority of the respondents were business people (20.27%) and the least were applicants (5.41%). Based on the zones, Zone I dominated with business people (10.9%) compared to zone 2 (2.7%) and zone III (6.8%). And in zone I the most represented were business people (10.9%) and the smallest was others and tailors (2.7%). In zone II the most represented were farmers (9.5%) and the smallest was teachers and tailors (2.7%) and in Zone III the most represented were others (builders, hairdressers, mechanics) (9.5%) and the smallest applicants, technicians and tailors with 2.7% each.



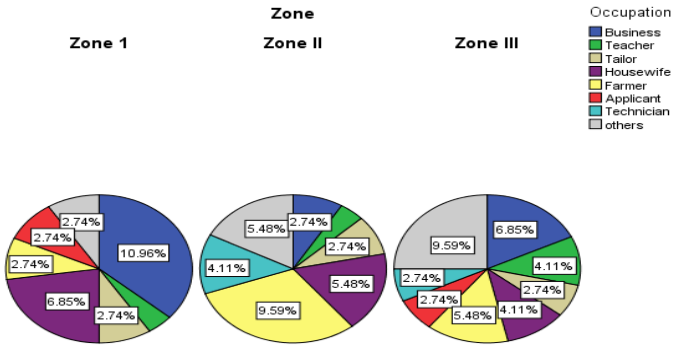


Figure2. *Occupation of the respondents across the study sites*

3.2. Species Diversity

Tree species Diversity and Frequency of Home Garden across Sites

The results showed that a total of 25 trees species (table 4) were classified under 15 families across the study areas. The family Arecaceae was the largest family represented by four species (16%), closely followed by Rutaceae and Malaceae represented by three species each (12%) Anacardiaceae, and Rosaceae which had two species (8%). The rest of the families were represented by a species each (Table, 5). The top five species in the study area were *Darcyodes edulis, Mangifera indica, Carica papaya, Cocos nucifera,* and *Citrus sinensis.*

Table4. *Tree species composition, density and frequencies across zones*

Family	Scientific name	Zone 1		Zone 2		Zone 3	
		Rel. Density	Rel. freq.cm/ha	Rel. Density	Rel. freq.cm/ha	Rel. Density	Rel. freq.cm/ha
Anacardiaceae	*Magnifera indica*	9.26	2.06	6.82	19.28	8.16	1.90
	Spondias dulcis			2.27	6.32		
Annonaceae	*Annona muricata*	1.85	0.41			2.04	0.47
Arecaceae	*Cocos nucifera*	7.41	1.65	13.64	23.50	8.16	1.90
	Elaeis guineensis	3.70	0.82			4.08	0.95
	Roystonea regia						
	Roystonea regia					6.12	1.42
Burseraceae	*Dacryodes edulis*	20.37	4.53	13.64	23.50	10.20	2.37
Caricaceae	*Carica papaya*	1.85	0.41	18.18	29.49	12.24	2.85
Lauraceae	*Persea americana*	3.70	0.82			8.16	1.90
lecythidaceae	*Petersianthus macrocarpus*	1.85	0.41			2.04	0.47
Malaceae	*Malus pumila*	1.85	0.41	6.82	19.28		
	Rosa sinensis					2.04	0.47
	Theobroma cocao	1.85	0.41	2.27	6.32	6.12	1.42
Moraceae	*Ficus mucoso*	1.85	0.41				
Moringaceae	*Moringa oleifera*	3.70	0.82	2.27	6.32	2.04	0.47
Myrtaceae	*Psidium guajava*			11.36	24.65		
Rosaceae	*Malus domestica*	1.85	0.41	9.09	17.92	6.12	1.42
	Pyrus communis			2.27	6.32		
Rutaceae	*Citrus limon*	1.85	0.41	2.27	6.32	6.12	1.42
	Citrus paradise			2.27	6.32		
	Citrus sinensis	7.41	1.65	4.55	8.75	10.20	2.37
Sapotaceae	*Pouteria campechiana*	9.26	2.06			4.08	0.95
Vitaceae	*Vitis vinifera*	1.85	0.41	2.27	6.32		

3.3. Shrub Species Diversity and Frequency in Home Garden

The results showed that 3 shrub species were categorized under 3 families across the study area. The families Malvaceae, Euphorbiaceae, and Rosaceae were represented by one species respectively (table 6).

Table5. *Shrub species composition density and frequency across zones*

		Zone I		Zone II		Zone III	
Family	**scientific name**	**%rel. density**	**rel. fre.cm/ha**	**%rel. density**	**rel. fre.cm/ha**	**%rel. density**	**rel. fre.cm/ha**
Malvaceae	*Abelmoscsia esculentus*	31.25	12.50	55.32	52.00	0.00	0.00
Euphorbiaceae	*Manihat esculenta*	68.75	27.50	40.43	44.00	0.00	0.00
Rosaceae	*rubue alleghaniensis*	0.00	0.00	4.26	4.00	0.00	0.00

3.4. Herb Species Diversity and Frequency of Home Garden

This result showed that a total of 46 herb species were categorized under 21 families across the study areas. The family Sapotaceae was the largest family represented by 9 herb species (19.4%), closely followed by Fabaceae, Malvaceae, and Poaceae represented by four species each (8.6%), Cucurbitaceae and Lamiaceae which had three species (6.5%), Amaranthaceae, Apocynaceae, Araceae and Asphadelaceae had two species (4.4%). The rest of the families were represented by one species each (2.2%). Asteraceae, Bignoniaceae, Bromeliaceae, Cucurbitaceae, Dioscoreaceae, Euphorbiaceae, Fabaceae, Portulacaceae, Talinaceae, Verbenaceae, and Zingiberaceae (Table, 6).

Table6. *Herbs species composition Density and frequency across zones*

Family	**Species**	**% Rel. Density**	**Rel. fre.cm/ha**	**% Rel. Density**	**Rel. fre.cm/ha**	**% Rel. Density**	**Rel. fre.cm/ha**
Amaranthaceae	*Amarantus blitum*	8.29	8.64	2.76	5.48	9.06	7.35
	Ficus hispida			0.39	1.37		
Apocynaceae	*Asystasia vogiliana*			1.3	1.37		
	Catharanthus roseus					0.79	1.47
Araceae	*Colocsia esclenta*	8.14	3.70	8.68	5.48	10.43	4.41
	Spathiphylum wallisii					0.79	1.47
Asphadelaceae	*Aloe barbadensis*						
Asteraceae	*Vernonia amygdalina*	7.20	9.88	9.2	9.59	5.51	8.82
Bignoniaceae	*Crescentia cujete*	0.78	1.23				
Bromeliaceae	*Ananas comosus*	0.47	1.23				
Cucurbitaceae	*Cucuneropsis*			1.55	1.37		
	Lactuca sativa					1.18	1.47
	Telfairia occidentalis	0.78	1.23	0.78	1.37	0.98	1.47
Dioscoreaceae	*Dioscorea cayenensis Lam.*	1.25	1.23				
Euphorbiaceae	*Manihat esculenta*	0.16	1.23			0.39	1.47
Fabaceae	*Cassia alata*			1.04	6.85	0.98	1.47
	Glycine max					1.18	1.47
	Phaseolus vulgaris			0.39	1.37		
Lamiaceae	*Mentha spicata*					5.12	8.82
	Ocimium bacilucum	2.03	6.17			0.59	1.47
	Ocimum gratissimum			1.49	6.85	3.35	5.88
Leguminosae	*Arachis hypogaea*	1.88	1.23				
Malvaceae	*Abelmoscsia esculentus*			0.26	1.37	1.77	1.47
	Hibiscus mechowii	0.47	1.23				

	Garcke						
	Hibiscus rosa-sinensis					0.39	1.47
	Triumfetta sp	0.78	1.23	0.91	1.37		
	Musa sp	1.10	1.23				
Plantaginaceae	*Musa paradisiacal*	3.91	6.17	1.94	4.11	3.15	2.94
Poaceae	*Costus lucanuscianus*			2.46	1.37	1.18	1.47
	Cymbopogon citrates	1.56	2.47	6.99	6.85	7.68	5.88
	Saccharum officinarum					0.79	1.47
	Zea mays	0.47	1.23	9.2	8.22	9.25	4.41
Portulacaceae	*Talinum triangulare*	29.89	9.88	15.54	2.74		
Sapotaceae	*Piper umbellatum*	0.47	1.23				
	Synsepalum dulcificum	1.41	2.47	5.44	2.74	3.35	2.94
Solanaceae	*Capsicum annuum*	3.13	4.94	3.24	4.11	2.36	4.41
	Gunus capsicum	1.88	3.70	1.17	2.74	1.97	1.47
	Physalis alkekengi	0.78	2.47	0.52	1.37		
	Solanum lycopersicum	1.41	2.47	0.91	1.37		
	Solanum malongena	0.47	1.23	2.2	1.37	1.57	1.47
	Solanum nigrum	5.79	4.94	4.02	2.74	4.72	1.47
	solanum sp	4.23	7.41	2.98	6.85	3.54	4.41
Talinaceae	*Talinum fruticosum*			5.7	1.37	6.10	2.94
Verbenaceae	*Lantana camara*					0.59	1.47
Zingiberaceae	*Hedychium flavescens*						
	Zingiber officinale			1.81	1.37	1.18	1.47

3.5. Climber Species Diversity and Frequency of Home Garden across Sites

Form the study area eight (8) species of climbers were found across study sites with 4 families. The family Dioscoreaceae with 5 species noted the highest (62.5%), while the rest of the families recorded one specie each. Apocynaceae, Cucurbitaceae, Dioscoreaceae, Solanaceae noted 12.5% each. (Table: 7)

Table7. *climber species composition, density and frequency across zones*

Family	**scientific name**	**zone 1**		**zoneII**		**zone III**	
		% Rel. Density	**rel. fre.cm/ha**	**% Rel. Density**	**rel. fre.cm/ha**	**% Rel. Density**	**rel. fre.cm/ha**
Apocynaceae	*Solanum incanum*	0	0	0	0	9.79	0.71
Cucurbitaceae	*Telfairia occidentalis*	32.88	4.38	58.14	40	33.57	2.44
Dioscoreaceae	*Dioscreals dumetrorum*	9.59	1.28	0	0	0.00	0.00
	Dioscorea alata	21.92	2.92	0	0	14.69	1.07
	Dioscorea cayenensis Lam.	0.00	0	3.49	6.67	11.89	0.86
	Dioscorea esculenta (Lour.) Burkill	13.70	1.82648	20.93	26.67	16.78	1.22
	Dioscorea rotundata (Poir.) J.Miege	17.81	2.37443	17.44	26.67	10.49	0.76
Solanaceae	*Piper nigrum*	4.11	0.54795	0	0	2.80	0.20

3.6. Creepers Species Diversity and Frequency of Home Garden

The results showed that a total of 4 creepers species categorized under 3 families were recorded across the study area. The family Cucurbitaceae was the largest family represented by 2 creepers species (50%), closely followed by Bignoniaceae, and Convolvulaceae represented by one species each (25%) (Table: 8)

Table8. *Creepers species composition density and frequency across zones*

Family	Scientific	zone 1		zone II		zone III	
		% Rel. Density	rel. fre.cm/ha	% Rel. Density	rel. fre.cm/ha	% Rel. Density	rel. fre.cm/ha
Bignoniaceae	*Crescentia cujete*	7.69	1.76	0.00	0.00	0.00	0.00
Convolvulaceae	*Ipomoea batatas*	7.69	1.76	46.30	30.77	21.62	16.67
Cucurbitaceae	*Cucuneropsis*	61.54	14.07	44.44	30.77	70.27	66.67
	Cucurbita maxima	23.08	5.27	9.26	38.46	8.11	16.67

3.7. Parameter of Diversities of the Different Plant Forms across Zones

Species richness, abundance, number of genera, number of families and Shannon index of trees species showed significant differences (P< 0.05) across zones (Table 9). This studied showed that zone 1 had more species richness of 18 trees/ha (Table 10) followed by zone 3 with 17 specie richness and zone II noticed the least with 15 species. Zone I had the highest number of genera (21) while zone I and II recorded (14) genera each (Table 10). Zone I and II showed the highest number of families with a value of 17 families each, zone III recorded the lowest with 11 families. Zone III recorded the highest value for Shannon index (H'=2.61), closely followed by zone 1 with value (H'= 2.33) and the lowest was zone II with (H'=2.03).

The Species richness, abundance, number of families and Shannon index of shrub species showed significant difference across zones (Table 8) while the number of genera of shrub species did not show significant different (P> 0.05). This studied showed that zone II recorded the highest specie richness for shrubs with 3 species (Table 9). It was closely followed by zone I with 2 specie richness and zone III recorded the least with 1 species. For abundance zone II had the highest (47), zone III was observed with (23) and the lowest was zone I with 1 species (Table 9). Also, with regards to genera, Zone II had the highest number of genera (3), zone I (2) and the zone III was noticed the least (1). Furthermore, Zone II showed the highest number of families with a value of (3) families, Zone I with (2) families zone III the least with (1) family. Zone II recorded the highest value for Shannon index (H'=0.78), closely followed by zone I with value (h= 0.63) and the lowest was zone III with (H'=0).

Species richness, abundance, number of genera, number of families and Shannon index of herbs species showed significant differences (P< 0.05) across zones (Table 10). This study indicates that the species richest for herbs were found in zone III with (31), closely followed by zone II with (30) and the lowest was zone I with (27). Also, the abundance of herb was indicated in zone II with (772), closely followed by zone III (508), and the lowest is zone I (67) .For the highest number of genera it was recorded in zone III (26), closely followed by zone II with (22) lastly zone III (22). Again, the highest number of families recorded was found in zone I (22), closely followed by zone II with (20) and the lowest is zone III with (18). And lastly, the highest Shannon index (H'= 3.12) in zone III, closely followed by zone II with value (H'= 2.88) and the lowest was zone I with (H'=2.45).

Species richness, abundance, number of genera, number of families and Shannon index of climber's species showed significant differences (P< 0.05) across zones (Table 10). The study indicated that the species richest for climbers were found in zone III with (7), closely followed by zone I with (6) and the lowest was zone I with (4). Also, the abundance for climbers was indicated in zone III with (147), closely followed by zone II (50), and the lowest was zone III with (24). For the highest number of genera it was recorded in zone I (4), closely followed by zone II and zone III (3) each. Again, the highest number of families recorded were found in zone III (4), closely followed by zone II and zone III with (2) each. And lastly, the highest Shannon index (H'= 2.47) in zone I, closely followed by zone III with value (H'= 1.66) and the lowest was zone II with (H'=1.04).

Abundance and Shannon index showed significant differences (P< 0.05) across zones while species, number of genera and number of families for creepers did show significant difference (P> 0.05) across zones (Table 10). This study showed that the species richest for creepers were highest in zone I with (4), closely followed by zone II zone III with (3) each. Also, the abundance for creepers was indicated in zone II with (54), closely followed by zone III (37), and the lowest was zone I with (26). For the highest number of genera it was recorded in zone I (4), closely followed by zone II and zone III (3) each. Again, the highest numbers of families recorded were found in zone I and zone III (3) each and the zone II with (2) each. And lastly, the highest Shannon index (H'= 1.07) in zone II, closely followed by zone I with value (H'= 1.02) and the lowest was zone I with (H'=0.71).

Table9. *Parameters of diversity of the different plant forms across zone*

	Parameter	**Zone 1**	**Zone 2**	**Zone 3**	**P values**
	species richness	18.57a	15ab	17b	0.027
trees	abundance	54a	44b	49c	0.001
	no. genera	21a	14b	14b	0.003
	no families	17a	17a	1b	0.001
	Shannon index	2.33a	2.03b	2.61c	0.001
	species richness	2a	3a	1b	0.002
shrub	abundance	16a	47b	23c	0.001
	no. genera	2a	3ab	1b	0.054ns
	no families	2a	3b	1b	0.011
	Shannon index	0.63a	0.78b	0c	0.001
	species richness	27b	30a	31b	0.007
herb	abundance	67a	772b	508c	0.001
	no. genera	22a	24ab	26b	0.008
	no families	22a	20ab	18b	0.008
	Shannon index	2.45a	2.88b	3.12c	0.001
	species richness	6a	4a	7b	0.027
climber	Abundance	24a	50b	147c	0.001
	no. genera	4a	2a	5b	0.009
	no families	2a	2b	4b	0.013
	Shannon index	2.47a	1.04b	1.66c	0.001
	species richness	4a	3a	3a	0.17
	abundance	26a	54b	37c	0.001
creepers	no. genera	4a	3a	3a	0.29
	no families	3a	2a	3a	0.202
	Shannon index	1.02a	1.07b	0.71c	0.001

3.8. Role of Home Gardens of Respondent across the Study Zones

Figure 3 indicates the role of home gardens were for; food purposed recorded the highest frequency 94 (25.5%), closely followed by medicine 77 (20.9%) and NTFPs recorded the least across the study zones.

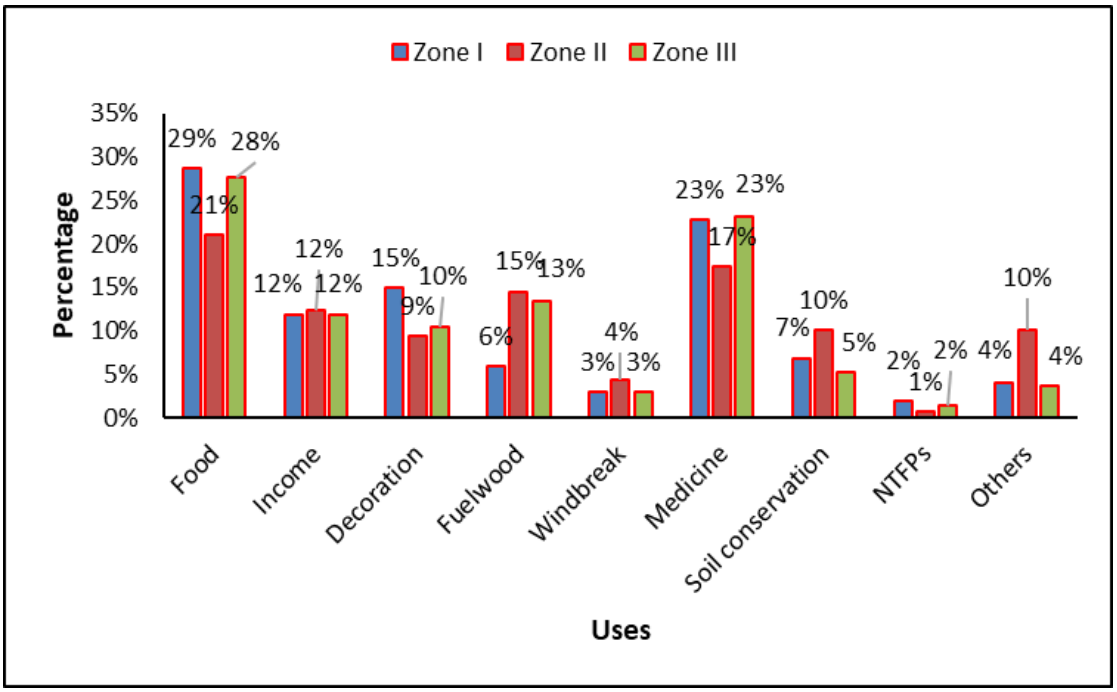


Figure3. *The role of home gardens of the respondent across the study zones*

3.9. Management Operations of Home Gardens from Respondents

Figure 4 indicates the main management operations of home gardens across zones where weeding 86 (18.7%) was recorded as highest, closely followed by pruning 79 (17.2%) and spraying 12 (2.6%) was the least.

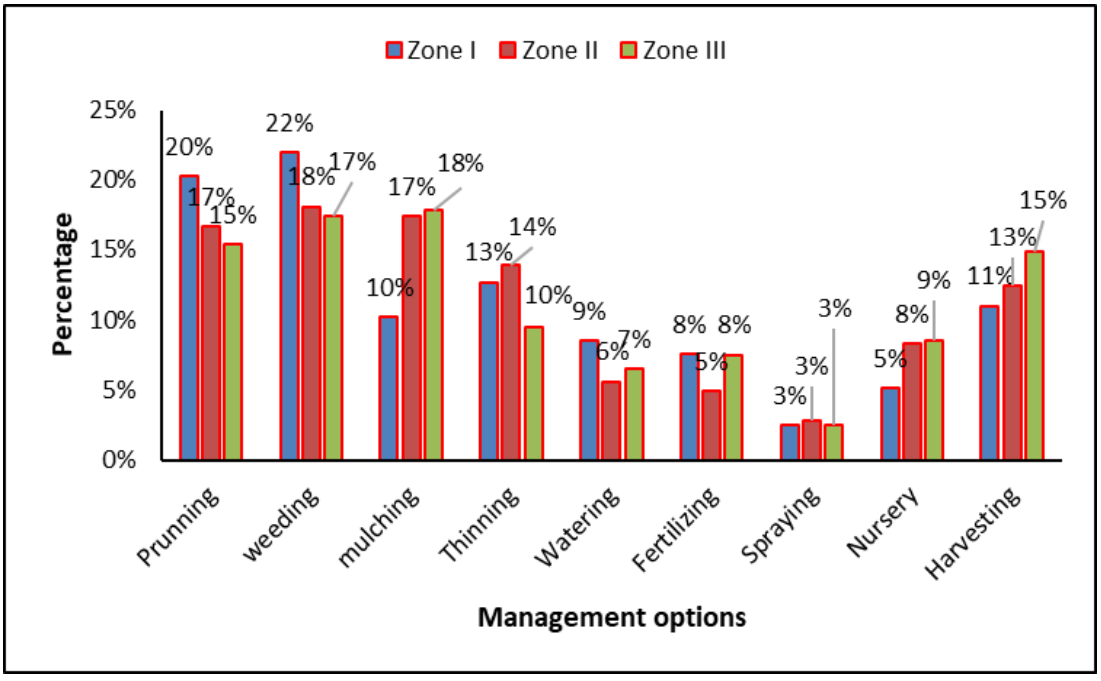


Figure4. *Management operations of home gardens across the study zones*

3.10. Challenges Faced in Home Gardens Management across the Study Site

Figure 5 indicates that the destruction by domestic animals like goats with a frequency of 66 (26.8%), closely followed by theft 59 (24%) and the least challenge faced was limited finance with 3 (2%).

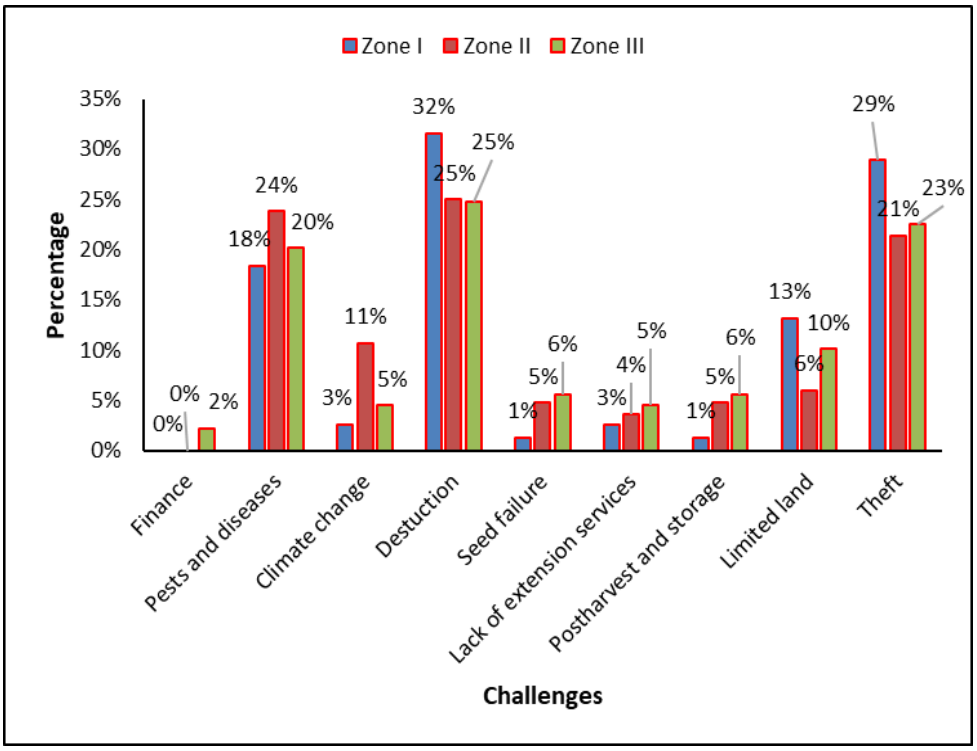


Figure5. *Challenges faced by respondent across the study zones*

4. DISCUSSION

Home gardening across the study sites in Kumba municipality is mostly practice by women using family labour. This result tends to suggest that in their effort to produce more food for home consumption and for the market, female household heads that are generally largely responsible for feeding their families tend to diversify the choices of plants, to meet both home consumption and market needs, compared to men, who are likely to be more income oriented. These results are in conformity with that of [16] in North West region of Cameroon who put women in the forefront in increasing plant species diversity in Kumba municipality. This, also corroborates with the finding of [17] who also reported that home garden characteristics like age, influence diversity, species richness and abundance of plants grown in home gardens ([18] and [17]. Women are key actors ensuring that the food consumed by the family is safe as required by the utilization dimension of food security. [19], shows that women play a more crucial role in food access and utilization. It has been reported over time, that there are abundance of species in older home gardens resulting to higher diversity and species richness with suitable conditions for growing more species [20] and [21]. However, it is necessary to mention that other variables like, level of education and social status of the home garden owner influence plant diversity and richness in home gardens [22]. In other words, home gardens managed by male household heads demonstrated less plant diversity than those of female household heads.A majority of the respondents involved in home gardening in the study sites are the middle aged women and men and at this age the farmers have the knowledge, experience and can develop solid agricultural projects [23].

The farmers in this study area are matured and can effectively take crucial decisions jointly with their spouse. The wives are still used for supportive operations. This trend seems to agreed with the findings of [23] in Gombe state, where majority of the respondent were married women. The farmers in this study area are aware of the importance of farming and pay much attention cultivation. Agriculture is the back born of growth for most developing countries, and agricultural production is one of the most effective ways to alleviate hunger and poverty [24]. The results showed that almost everyone partakes in agricultural activities across the study sites and they are fairly educated. Thus, can access and make use of information/innovations that will enhance production. This is in line with findings of [25] who reported that high literacy level will enable farmers to understand the intricacies of production which might also positively influence the home garden business.

With respect to household size, a majority of the households had 4-7 members which they depend for family labour. This study is in conformity with the findings of [5] who reported that a high proportion of respondents provided labour for the family and reduced cost of paying labour in their farms. Home garden farmers in Kumba showed some experience in farming as an ensuring occupation. In zone II of the study site recorded farmers to be the most represented (9.5%). This agrees with the findings of [22] which reported that continuous practice of an occupation for a long period presumably makes a person more experienced and more production. The farmers in the study zones mostly farm for household consumption and for sale and farming is not the main economic activity in kumba. According to [18], over 70 percent of poor people in Sub-Saharan Africa depend on agriculture for their livelihood. The farmers in this area are matured and can effectively take crucial decisions jointly with their spouses since most of the respondent in the study sites were married.

A total of 86 useful plant species belonging to five plant forms with 25 trees species (table 5) were categorized under 15 families were recorded across the study area. Species richness, abundance, number of genera, number of families and Shannon index of trees species showed significant differences ($P< 0.05$) across zones (Table 10). This is an indication that the sites of the home gardens were rich in the different plant forms. [14] reported related findings with diverse plant forms in the North West region Cameroon.

For herbs 46 species were categorized under 21 families recorded across the study areas (Table, 7). The family Sapotaceae was the largest family represented by 9 herb species (19.4%). Species richness, abundance, number of genera, number of families and Shannon index of herbs species showed significant differences ($P< 0.05$) across zones (Table, 10). This study also recorded a number of useful plants in home garden. It was also noticed that [24] reported similar useful plants in their research sites. The total number of useful plant species recorded in home gardens in Kumba is more or less similar to that recorded in other localities of the Tropical region. In Cameroon recent studies reported 61 plant species in the peri-urband zone of Bafia, center region of Cameroon and 212 plant species from 150 home gardens in Galim-Tignere, Adamawa region [25] and [26]. Also, in Ethiopia, number varies from 69, 138 and 258 useful plant species were recorded respectively in Jabithenan District, Arba Minch Town and Hawassa city [27], [28] and [29].

Trees, herbs, shrubs, climbers and creepers were the different plant forms noticed across the study sides. [14] in North West region of Cameroon noticed similar plant forms in their study.

Home gardens play a paramount role in the livelihoods of the people across the study zones. This indicated that home gardens are mainly used as food to households, medicine, income, soil conservation, decoration, fuel wood and wind bricks to protect the houses of the farmers. Home-gardens provide both economic and social advantages with their various agricultural crops and trees that accomplish the basic needs of the local population. This is in line with the findings of [30] where he mentioned that home gardens provide economic, social and cultural benefits as well as ecologically sound and biologically sustainable. The results from the research indicate that most home gardens were located close to their houses. This is in conformity with the findings of [29] that indicated that most indigenous people live in close proximity with their natural resources which they obtained their goods and services. These goods and services play major roles as most of these communities totally depend on for their livelihoods.

The communities of the study area manage the home garden agroforestry traditionally or by their indigenous knowledge. The respondents pointed out that this knowledge is orally passed from generation to generation. Men and women are involved in the management activities of home gardens; women are most participants during cultivation, harvesting and marketing activities which are in agrement with the findings of [31]. Accordingly, Women do the planting activity for fruit and vegetables, fertilizing, harvesting, storage, transportation and marketing of home garden products. The results of this research already indicated that numbers of women practicing home gardens are high when compared. This means that management is optimal since most management activity like weeding, mulching, harvesting and thinning were recorded the greatest as a management practice across the sites of study. This finding is in corroboration with [32] and [33] who indicated that in many communities, women have key role in managing the garden and utilizing its produce, either in their own kitchen or by selling it in the market. Also, [28] added that weeding is one of the main parameter used in home garden management practice in which women have direct involvement.

Another management activity that recorded in the study zones is pruning of multipurpose trees in home gardens in the study sites. Owing to this practice, different tree species are cultivated mixed with annual and perennials in the home gardens. The practice of pruning of indigenous trees in home gardens is done for various purposes. It improves light interception by the herbaceous layer beneath the trees and pruned twigs are also used as fodder while the branches are used as fuel wood this is in line with [35].

Though there are multiple benefits of home gardening for developing countries, the results from the study sites also reveals the key constraints to the productivity and sustainability of home gardens and makes recommendations for improving the home gardens and making them a viable and sustainable enterprise. The constraints faced by majority of the respondent across the study sites is destruction by domestic animal like local birds, goats that eats up and destroy crops like maize, plantains and other pest like rat moles that eat up tuber crops like cocoyam, cassava in their home gardens this in line with the findings of [31]), reported that home garden farmers identified disease, climate change, small size of home garden area, lack of improved seed and rodent infestation (rat) as the major challenges facing the communities. Also, another challenged faced by farmers across the study sites are disease and pest infestation like stem borers was reported as the main problems for onset production especially for corn, snails that eats up the leaves of most eatable vegetables found in home garden which can be attributed to the fact that Kumba has the humid and tropical climate which is suitable for the fast multiplication of disease causing organism and pest. [36] in similar report pointed that disease is the major problem of home garden species based on the research he conducted in the Gimbo District of South West Ethiopia.

5. CONCLUSION

Home gardens in the study zones aer mostly practice by females who are middle aged to aged 30-40 and 50 years > who are married with some level of education having as trading and farming as their main occupation. They mostly have a house hold size of 4-7 which indicates that family labour is used on the small piece of land.

Trees, herbs, climbers, shrubs and creepers are the main plant forms noticed across the study area giving a total of 86 useful plant species. Species richness, abundance, number of genera, number of families and Shannon index of trees species showed significant differences ($P< 0.05$) across zones. The number of genera of shrub species did not show significant different ($P> 0.05$). Species richness, abundance, number of genera, number of families and Shannon index of herbs species showed significant differences ($P< 0.05$) across zones. Abundance and Shannon index showed significant differences ($P< 0.05$) across zones while species, number of genera and number of families for creepers did not show significant difference ($P> 0.05$) across zones (Table 10).

Home gardens play a crucial role in the livelihoods of the people across the study zones which indicate that home gardens are mainly used for food to the households, medicine, income, soil conservation, decoration, fuel wood and wind bricks to protect the houses of the farmers. Home-gardens provide both economic and social advantages with their various agricultural crops and trees that accomplish the basic needs of the local population.

According to the field observation, the communities of the study areas manage the home garden agroforestry traditionally or using indigenous knowledge since they receive little services from extension agents. The respondents pointed out that this knowledge is orally passed from one generation to the other generation. Men and women are involved in the management activities of home gardens; women are highly involve during planting activity for fruit and vegetables, wedding, mulching, thinning, fertilizing, harvesting and marketing activities.

The constraints faced by majority of the respondent across the study sites are destruction by domestic animal such as fowls, goats that eats up and destroy crops like maize, plantains and other pest like rat moles that eat up tuber crops like cocoyam, cassava in their home gardens, disease like rust, panama and pest infestation like stem borers on corn was reported as the main problems for onset production especially, snails also eats up the leaves of most eatable vegetables and other factors like theft, climate change, small size of home garden area, lack of improved seeds, seedling failure, lack of extension agents were also recorded across the zones. proper mamagement of homegarden may lead to improve biodiversity diversity and food security in communities.

REFERENCES

[1] Rattan L. (2010). Managing soils and ecosystems for mitigating anthropogenic carbon emissions and advancing global food security. Bioscience 60: 708–721.

[2] Hong, T. N and Saizen I. (2019). Forest ecosystem services and local communities: towards a possible solution to reduce forest dependence in Bach Ma National Park Vietnam. Human Ecology 47:465-476

[3] Ndah R. N, Lucha C. F. and Tata Y, Loh C. E (2014). Population structure and regeneration status of trees used in making wooden mortar and pestle in the Takamanda rainforest South West Region, Cameroon. International Journal of Plant and Soil Science 3(1):1374-1386.

[4] Ndah RN**,** Egbe E. A. and Bechem E (2013). Species composition, diversity and distribution in the disturbed Takamanda Rainforest, south west, Cameroon. *African Journal of Plant Science* 4: 223-232)

[5] Ndah, R. N , Taku, J. Lucha F. L and Mutange E. H. (2022). Status, challenges and mitigation strategies of production of non-Timber Forest products in Mundemba Municipality, South Region, Cameroon Journal of Agriculture and Ecological Research International 23(6):114-126

[6] FAO(2023).The state of food security and nutrition in the world p5-21

[7] MINADER (2015). The State of Cameroon's Biodiversity for Food and Agriculture by The Ministry of Agricultural Development.

[8] Adekunle O.O, Monde M., Odeyemi A.S. (2014). The role of home garden in household food security in Eastern Cape: A case study of three villages in Nkonkobe Municipality Journal of Agriculture 6: 1-29

[9] IRAD-Barombi, (2021). Climate of Kumba

[10] KCC, (2016) Map of kumba city council

[11] K DTPKUC, (2005). Map of Kumba Department of Town Planning

[12] Morgan D.W., (1970). Determining sample size for research activities. Educational and psychological measurement. 30: 607-610.

[13] Ndah, R. N, Lucha C. F. and Tata Y, Loh C. E (2014). Population structure and regeneration status of trees used in making wooden mortar and pestle in the Takamanda rainforest South West Region, Cameroon International Journal of plant and soil science 3(1):1374-1386.

[14] Misra R (1968). Ecology Work Book. Oxford-IBH Publishing Company: Calcutta, India. Mueller-Dombois D, Ellenberg H (1974). Aims and Methods of Vegetation Ecol. John Wiley & Sons, Inc: New York, USA. Shannon CE, Wiener W.1949. The mathematical theory of communication. The University of Illinois press.

[15] Balgah RA. (2017). A gender analysis of vulnerability to climate-related food shortages in developing countries. The case of Cameroon, International Journal of Developmental Research 7(9): 15065-15074.

[16] Mbi L.W, Balgah A.R, Tacham N.W, Fru F..S, Seidou S. M and Andre- Ledoux N.(2022). Plant based Agrobiodiversity in home garden of Tubah subdivision North West Region Algerian Journal of biodiversity 03(01):005-0018

[17] Quiroz C, Gutiérrez M, Rodríguez D. (2001). Home gardens and insitu conservation of agrobiodiversiy-Venezuelan component. In: J.W. Watson & Eyzaguirre P. (eds). 17-19 S

[18] Hyder, A.A, Maman, S., Nyoni, J. E,. Khasiani, S. A., Teoh, N., Premji, z., and Sohani, S (2005). The pervasive trade of food security, gender iniquity and women's health.

[19] Bannister M. E and Nair P. K. R. (2003). Agroforestry adoption in Haiti: The importance of household and farm characteristics. Agroforestry Systems, 57(2):149-157.

[20] Blanckaert I, Swennen R. L, Paredes M, Rosas R, Lira S. R. (2004). Floristic composition, plant uses and management practices in homegardens of San Rafael Coxcatlán. Valle de Tehuacán-Cuicatlán, México. J Arid Environ, 57:39–62.

[21] Panyadee P, Henrik B, Prasit W, Angkhana L. (2016). Woody Plant Diversity in Urban Home gardens in Northern Thailand. Economic Botany. 70(3):285-302.

[22] Fabiyi, E.F.,Danladi, BB Akando, K.E., and Mahmood Y.(2007) role of women in agricultural development and constraints: a case study of Biliri local government area, Gombe State Nigeria.

[23] Anderson, J.R and Feder G. (2002). Rural Extension Service, World Bank, Agriculture and Rural Development, Washington DC.

[24] Oluyole , K. (2005). Evaluation of economics of post harvest processing of cocoa in cross River State, Nigeria. Journal of forestry and social science 3 (2): 58-64.

[25] Pamungkas RN, Hakim L. (2022). Ethnobotanical investment to conserve home garden species of plants in Tambakrejo, Algerian journal of biosciences 03(02) :005–018 18

[26] Mapongmetsem P, Etchiké M. D, Ngassoum M. B. (2016). Conservation et valorisation de la biodiversité dans les agroforêts de la zone périurbaine de la ville Bafia (Région du Centre au Cameroun) Revue Scientifique et Technique Forêt et Environnement du Bassin du Congo, 6:60-69.

[27] Hamawa Y, Mapongmetsem P. M. (2018). Crops diversity and typology of home gardens of Galim-Tignere (Adamawa, Cameroon). Int J Agrofor Silvicul., 6 (2):343-353.

[28] Mekonnen EL, Asfaw Z, Zewudie S. (2014). Plant species diversity of homegarden agroforestry in Jabithenan District, NorthWestern Ethiopia. Int J Biodivers Conserv. 301-307.

[29] Reta R. (2016). Useful plant species diversity in homegardens and its contribution to household food security in Hawassa city, Ethiopia. African Journal of Plant Science 10(10): 211-233

[30] Kebebew M. (2018). Diversity and Management of Useful Homegardens Plant Species in Arba Minch Town, Southern Ethiopia: Implication for Plant Diversity Conservation and Food Security. Int J Econ Plants., 5(3):137-148.

[31] MoFED (2007). Ethiopia building on progress: a plan for accelerated and sustained development to end poverty Addis Ababa: Ministry of Finance and Economy Development. Annual progress report.

[32] Yirefu T, Adugna B and Behailu B (2019). Homegarden Plant use and their Traditional Management Practice in Bule Hora District, West Guji Zone, Southern Ethiopia.Agricultural Research and Technology 21(4):556168

[33] Abiyot B, Zemede A (2016). The Role of Home Gardens for Conservation and Sustainable Utilization of Plant Biodiversity of Ethiopia

[34] Blanco H, Lal R. (2008). Principles of Soil Conservation and Management, The Ohio State University, Columbus, OH, USA Kansas State University, Hays, KS, USA.

[35] Blanco H, Lal R. (2008). Principles of Soil Conservation and Management, The Ohio State University, Columbus, OH, USA Kansas State University, Hays, KS, USA.

[36] Alebachew A, Habtamu K, Eba M S. (2019). Assessing Fruit Tree Species Diversity in Home Garden Agro-Forestry and Their Role Supporting Local People's Livelihoods in Burie District, Ethiopia. Turkish Journal of Agriculture - Food Science and Technology, 7(7): 946-954,

[37] Coomes OT, Ban N. (2004). Cultivated plant species diversity in home gardens of an Amazonian peasant village in northeastern Peru. Economic Botany, 59:420-434.

Citation: *Njoh Roland Ndah et al."Floristic Composition of Home Gardens and their Role in the Livelihood of the People of Kumba Municipality, Southwest Region, Cameroon", International Journal of Forestry and Horticulture (IJFH), vol. 9, no.1, pp. 33-49, 2023. http://dx.doi.org/10.20431/2454-9487.0901004*