



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



International Journal of Agricultural Sciences and Technology




Publisher's Home Page: <https://www.svedbergopen.com/>



Research Paper

Open Access

Dynamics and Floristic Structure of Kouampante Community Forest (Savannahs' Region, Togo)

Kossi Senyo Ehlui^{1,2*} , Alagie Bah³, Wouyo Atakpama^{4,5} , Henrik von Wehrden⁶, Christian Anthony-Krueger⁷ , Edinam Kola⁸ and Tchaa Boukpepsi⁹

¹West Africa Science Service Center on Climate change and Adapted Land Use, WASCAL-University of The Gambia, Banjul, Gambia. E-mail: ehlui.k@edu.wascal.org

²Laboratoire de Recherche sur la Dynamique des Milieux et des Sociétés, Department of Geography, University of Lomé; 01BP1515, Lomé, Togo.

³Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF), Nairobi, Kenya. E-mail: alagiebh@gmail.com

⁴Laboratoire de Botanique et Écologie Végétale, Département botanique, Faculté des sciences, Université de Lomé, 01 BP 16515, Togo. E-mail: wouyoatakpama@gmail.com

⁵West Africa Plant Red List Authority (WAPRLA), IUCN Species Survival Commission, Rue Mauverney 28, 1196 Gland, Switzerland.

⁶Faculty of Sustainability, Center of methods, Leuphana University of Lüneburg, Lüneburg, Germany. E-mail: Henrik.von_wehrden@leuphana.de

⁷Department of Science Education, University of Cape Coast, Cape Coast, Ghana, E-mail: canthonykrueger@ucc.edu.gh

⁸Laboratoire de Recherche sur la Dynamique des Milieux et des Sociétés, Department of Geography, University of Lomé; 01BP1515, Lomé, Togo. E-mail: edikola@yahoo.fr

⁹Laboratoire de Recherches Biogéographiques et d'Études Environnementales, Department of Geography, University of Lomé, Lomé, Togo. E-mail: tchaa.boukpepsi@gmail.com

Article Info

Volume 4, Issue 1, May 2024

Received : 19 January 2024

Accepted : 21 April 2024

Published : 05 May 2024

doi: [10.51483/IJAGST.4.1.2024.27-42](https://doi.org/10.51483/IJAGST.4.1.2024.27-42)

Abstract

Community forests are being promoted in Togo as an alternative to the degradation of protected areas and as a means of restoring forest landscapes. The present study is carried out within Kouampante Community Forest (KCF) in Ogaro (Togo, West Africa). It intends to contribute to the sustainable management of KCF. Specially, it aims at: (i) mapping forest ecosystems and analysing their dynamics and (ii) characterising the floristic diversity of the KCF. Forest ecosystems are mapped and their dynamics evaluated based on Google Earth images of 2010 and 2020. The floristic and silvicultural analyses are based on inventories carried out in 13 plots of 1,000 m² each. The KCF is made up mainly by tree/shrub savannahs (58.73%) and croplands/fallow (41.27%) in 2010. These two land use types have undergone changes over the period. In 2020, the KCF had two land use types: tree/shrub savannahs (84.30%) and croplands/fallows (15.70%). The flora census consisted of 59 species grouped in 6 families. The most important plant species are *Detarium microcarpum* and *Vitellaria paradoxa*. The Fabaceae were the most abundant and diversified families, followed by the Combretaceae. The demographic structure showed a high abundance of individuals with small diameter and height. This indicates the possibility of a rapid restoration of the native vegetation. Protecting the forest from anthropogenic threats could be crucial for achieving the desired objective.

Keywords: Community forest, Landscape restoration, Biodiversity, Koampante, Savannah region, Togo

© 2024 Kossi Senyo Ehlui et al. This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

1. Introduction

Community forests are forests collectively managed by local communities to protect biodiversity and support livelihoods. They are governed by customary rights, rules, and institutions that pre-date most modern governments, and continue

* Corresponding author: Kossi Senyo Ehlui, West Africa Science Service Center on Climate change and Adapted Land Use, WASCAL-University of The Gambia, Banjul, Gambia. E-mail: ehlui.k@edu.wascal.org

2710-3366/© 2024. Kossi Senyo Ehlui et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

to adapt to changing circumstances. They could have spiritual and cultural connotation (sacred groves and forest) exclusively (Adjonou et al., 2021; Atakpama, Badjare et al., 2022; Ehlui et al., 2024b) or not. They provide non-timber (foods, medicines products, cosmetics, honey, meats...), timber products and others services. Thus, community forests are important for several reasons, as they provide a wide range of social, political, environmental and economic benefits (Bhusal et al., 2018). They also provide primary source of livelihood, nutrition and employment. They contribute to biodiversity conservation, improve forest restoration and climate resilience (Baynes et al., 2015; Giri et al., 2023; Kombate et al., 2023a; Wulandari et al., 2021).

The protection of biodiversity through sacred and community forests is of growing international concern in Africa and elsewhere (Atakpama et al., 2023a; Atakpama et al., 2023b; Beukeboom et al., 2010; Ehlui et al., 2024a; Kombate et al., 2023a; Moayeri et al., 2022). These are the objectives of the Togolese government. Since 2015, it has produced a guide to community forestry. Several projects supporting community forest initiatives were then launched. Currently, 171 community forests can be found nationwide (Atakpama et al., 2023b). Fewer of these, however, comply with the Guide. Moreover, there is a lack of scientific data to help guide how to manage them. These data include knowledge of biodiversity, landscape structure and dynamics, timber resource status, management practices and the existence and functioning of management committees. Although several studies have investigated about the management of both community forests (Atakpama et al., 2022; Atakpama et al., 2023a; Atakpama et al., 2023b; Bawa et al., 2022; Folega et al., 2023; Folega et al., 2017; Kossi et al., 2022; Koumoui, 2023) and sacred groves and forests (Adjonou et al., 2021; Atakpama et al., 2021; Konko et al., 2018), however, there is lack of relevant data on Savannah community forest dynamics. Thus, such knowledge can be helpful in enhancing our understanding of the role of local communities in managing forest resources (Musyoki et al., 2016). Our study will provide vital information necessary to improve sustainable community forest management practices.

As a result of climate change and the increase in population, the savannah region has had less forest cover. Agroforestry parklands cover most of the land (Folega et al., 2019a). Protected areas are sometimes the only forest ecosystems. Unfortunately, these protected areas have undergone significant degradation since the socio-political unrest in the 1990s (Folega et al., 2012; Dimobe et al., 2012; Polo-Akpisso et al., 2018a; Atakpama et al., 2023c; Folega et al., 2021). For species that have already disappeared or are threatened with extinction, sacred and community forests thus serve as true sanctuaries.

The present study, carried out on the KCF, aims to demonstrate the contribution made by the KCF to restoring forests and conserving biodiversity in Togo. More specifically, it: (i) analyzed the dynamics of the forest ecosystem from 2010 to 2020, (ii) assessed the diversity of plant species, and (iii) characterized the demographic structure of woody plants in KCF.

2. Methodology

2.1. Study Area

KCF is located in Ogaro Canton, Kpendjal-Ouest Prefecture, Savannahs Region, Togo (Figure 1). The target forest belongs to Togo's ecological zone I (Ern, 1979). The native vegetation of the Soudanian savannahs is dominated by

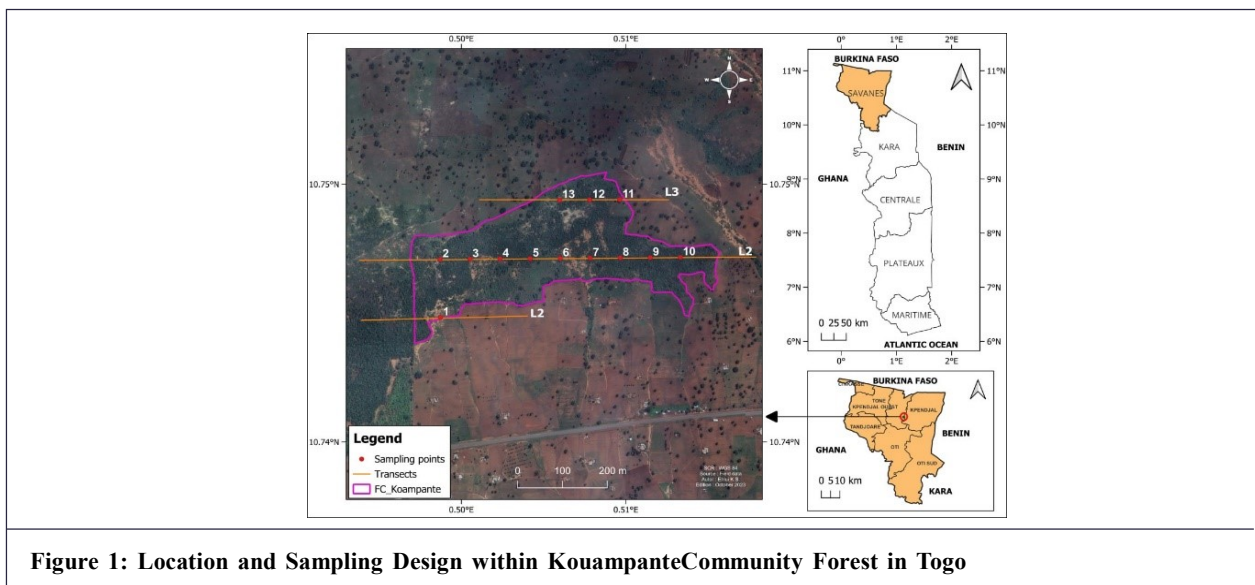


Figure 1: Location and Sampling Design within Kouampante Community Forest in Togo

thorny species (Akpagana and Bouchet, 1994; Brunel et al., 1984). Due to the increasing human population, the native ecosystems have been transformed into croplands and agroforestry parklands (Folega et al., 2021). Several agroforestry parklands have been found. The predominant agroforestry trees are raost palms (*Borassus* spp), african locust bean (*Parkia biglobosa* Jacq), tamarind (*Tamarindus indica* L.), African baobab (*Adansonia digitata*) (Atakpama et al., 2022; Folega et al., 2019a; Kebenzikato et al., 2014; Padakale et al., 2015; Samarou et al., 2022). These agroforestry trees play an important role in improving local nutrition and livelihoods (Kebenzikato et al., 2023; Samarou et al., 2023). In addition to cropland expansion (Folega et al., 2021; Folega et al., 2019a), grazing is highlighted as a second threat to plant communities (Ibrahim-naim et al., 2021). Protected areas of the savannahs region, long known as a technique to conserve biodiversity and ecosystems, are also highly degraded and invaded (Atakpama et al., 2023c; Badjare et al., 2021; Polo-Akpisso et al., 2018b). To counter this degradation, community forests and sacred forest/grove practices are seen as an opportunity to conserve biodiversity (Atakpama et al., 2023b).

2.2. Data Collection

2.1.1. Satellite Image Acquisition

LocustMap, a mobile application, was first used to delineate the boundaries of the KCF. The KML shapefile was then projected onto Google Earth images supplied by Astrium Service to Google Inc 2010, 2014, 2020 for the digitisation of the land use units. These images were chosen due to their high resolution (up to 1.5 m) and the small area covered by the KCF (Egbelou et al., 2021; Folega et al., 2017).

2.1.2. Sampling Design

Thirteen sample plots, equidistant by 100 m, were established along three transects separated by 200 m. Four types of inventories were carried out: the phytosociology, the ecology, the forestry and the regeneration. The phytosociology of the woody species, the ecology and the forestry parameters were assessed within plots of 50 m x 20 m in size (Atakpama et al., 2022). For the phytosociology of herbaceous species, sub-plots of 10 m x 10 m were established in the centre of the main plot (Polo-Akpisso et al., 2015). Within the main plot, 3 subplots of 5 m x 5 m were defined for regeneration inventories, one in the centre and the other two in the opposite corners on both sides of the central plot, arranged diagonally (Atakpama et al., 2021; Polo-Akpisso et al., 2015; Thiombiano et al., 2015).

2.1.3. Inventories

The phytosociological inventory of plants has been carried out on the basis of the Braun-Blanquet (1932) abundance/dominance scale. This scale is defined as follows: rare species, coverage 0-1% (+); coverage 1-5% (1); coverage 5-25% (2); coverage 25-50% (3); coverage 50-75% (4); coverage 75- 100% (5). Vegetation type, grazing, wildfire, erosion were recorded as ecological parameters. Tree diameter, stem height and total height of woody plants with DBH \geq 5 cm were measured during the forest inventory (Folega and Ekoungoulou, 2022). A forestry compass was used to measure tree diameter at 1.30 m above the ground. Stem height and total height were assessed by visual evaluation. All woody species with DBH < 5 cm (Samarou et al., 2022) were defined as potential regeneration.

2.2. Data Analysis

2.2.1. Land Use Unit Mapping

The different land-use units of KCF were digitised using Google Earth Pro software. To validate the digitised occupation units, ground truth points were projected. The resulting shapefiles were transferred to QGIS 2.30 for mapping (Egbelou et al., 2021). WGS 84 UTM Zone 31N was used as the projection background. Land use dynamics and transition were determined by comparison of the different maps (Kokou et al., 2023).

2.2.2. Assessment of The Floristic Diversity

The vegetation data collection was downloaded in Microsoft Excel spreadsheet format. A list of the plants of the Kouampante forest were then drawn up. The genera and botanical families were used to classify each species listed. Classification used was APG IV (Atakpama et al., 2023a), which was accessed from the website: <https://africanplantdatabase.ch/en>. Biotypes and chorology were established (Assi-Ake, 1985; White, 1986). The following biotypes were considered: phanerophytes (Ph), chamephytes (Ch), hemicryptophytes (He), geophytes (Ge), therophytes (Th) and epiphytes (Ep). Phanerophytes include: megaphanerophytes (MP) (trees over 30 m), mesophanerophytes (mP) (trees 10 to 30 m), microphanerophytes (mp, trees 2 to 10 m), nanophanerophytes (np, trees 0.4 to 2m), lianaceous forms

(Lnp, Lmp, LmP, LMP) (Dimobe et al., 2012). A tropical African context was used for the chorology. These are as follows: GC = species known in Guineo-Congolese zone, GCW = species belonging to western forest massif, GCE = species belonging to eastern forest massif, SZ = species known in Sudano-Zambesian zone, GC-SZ = species found in both zones, I = species introduced for agriculture, forestry or horticulture.

2.2.3. Forest Characteriscics Analysis

Four major dendrometric parameters were evaluated: tree density per hectare (D), mean lorry height (HL in m), mean diameter (Dm in cm) and basal area (G in m²/ha) (Bawa et al., 2022; Samarou et al., 2022). Trees with DBH e” 5 cm were considered. Mean Lorey Height is calculated by averaging tree heights weighted by basal area (West, 2004). Trees are classified into diameter and height classes. The minimum diameter is 5 cm and the minimum height is 2 m. To fit the demographic structure of the trees to the theoretical distribution, the 3 Weibull parameters (a = location parameter, b = scale or size parameter and c = shape parameter related to the diameter or height structure) were used (Samarou et al., 2022).

3. Results

3.1. Land Use Units Dynamic

An analysis of Google Earth images shows that the Kouampante community forest in 2010, 2014 and 2020 consists of tree savannah/shrub savannah and arable/fallow land (Figure 2). The same occupations were represented in 2014. Tree/shrub savannahs accounted for 33% of the forest. Croplands/Fallows accounted for 67%. In 2010, tree savannah/shrub savannah covered 58.73% of the forest, followed by cropland and fallow (41.27%). In 2020, tree savannahs/shrub savannahs occupy 84.30% of the Kouampante CF. This is followed by croplands/ fallow land (15.70%).

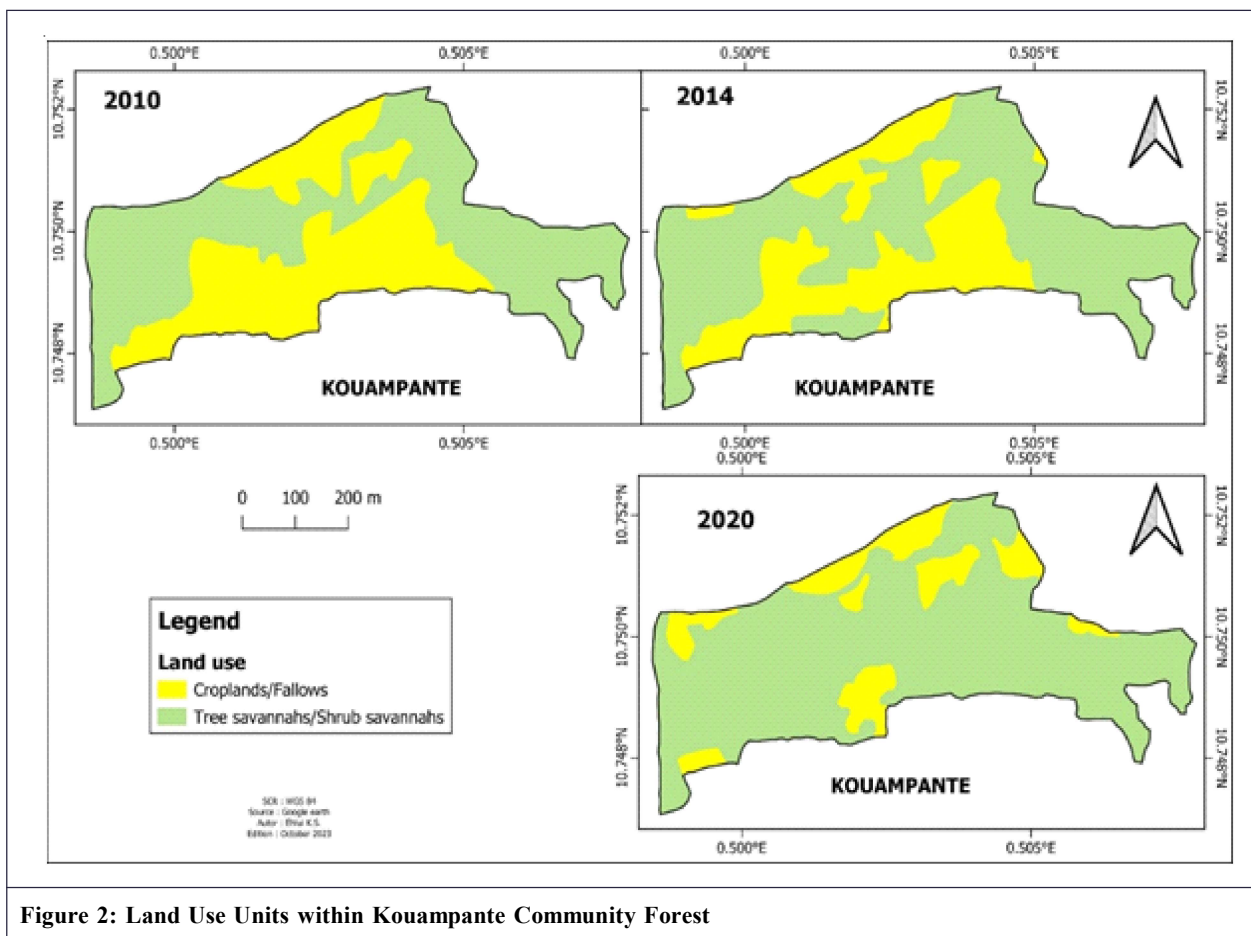


Figure 2: Land Use Units within Kouampante Community Forest

Between 2010 and 2020, the Kouampante community forest was characterised by a decrease in croplands/fallows (-61.97%). This contrasts with an increase in tree/shrub savannah (43.55%) (Table 1).

By analyzing the land use transition matrix for the Kouampante community forest (Table 2), it was possible to identify the main conversions between 2010 and 2020. A conversion rate of 4.23% was applied to the conversion of trees/shrub savannahs to croplands/fallows. Stability exists for 11.06% croplands/fallows and 53.04% tree/shrub savannahs (Figure 3).

Table 1: Change Rate of Land use of Kouampante Community Forest from 2010 to 2020

Land Use Units	2010		2014		2020		Change Rate (%)		
	Superficie (ha)	%	Superficie (ha)	%	Superficie (ha)	%	2010-2014	2014-2020	2010-2020
Croplands/Fallows	11.28	41.27	9.02	33.00	4.29	15.70	-20.04	-52.44	-61.97
Tree/Shrub savannahs	16.05	58.73	18.31	67.00	23.04	84.3	14.08	25.83	43.55
Total	27.33	100	27.33	100	27.33	100			

Table 2: Land Use Transition Matrix 2010-2014, 2014-2020, and 2010-2020

To		2014			To		2020			To		2020		
		C/F	TS/SS	Total			C/F	TS/SS	Total			C/F	TS/SS	Total
2010	C/F	30.68	11.25	41.93	2014	C/F	9.99	22.98	32.97	2010	C/F	11.06	31.66	42.73
	TS/SS	1.99	56.08	58.07		TS/SS	6.06	60.97	67.03		TS/SS	4.23	53.04	57.27
	Total	32.67	84.7	100		Total	16.05	83.95	100		Total	15.3	84.7	100

Note: C/F : Croplands/Fallows, TS/SS : Tree Savannahs/Shrub Savannahs.

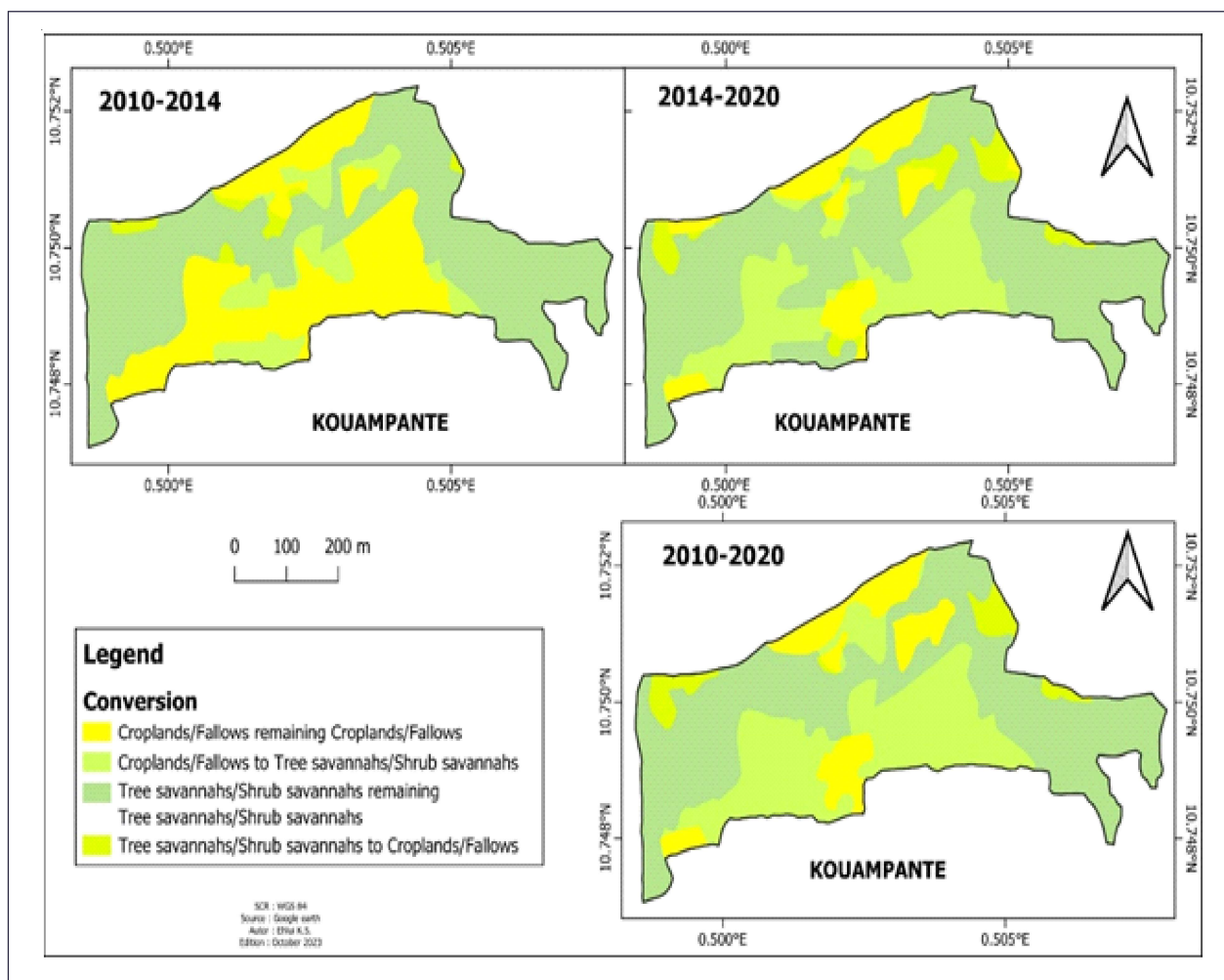


Figure 3: Change of land use in Kouampante Community Forest in Togo

3.2. Floristic Diversity of Kouampante Community Forest (KCF)

A total of 59 species from 50 genera and 24 families were recorded. *Detarium microcarpum* Guill. & Perr. is the dominant and frequent species in the whole landscape. Occupying 37.73%, this species was recorded in all plots. *Guiera senegalensis* J.F.Gmel. is the second most abundant species (11,39 %). Apart from *D. microcarpum*, the most frequent species are: *Vitellaria paradoxa* C.F.Gaertner subsp. *paradoxa* and *Combretum collinum* Fresen (Figure 4).

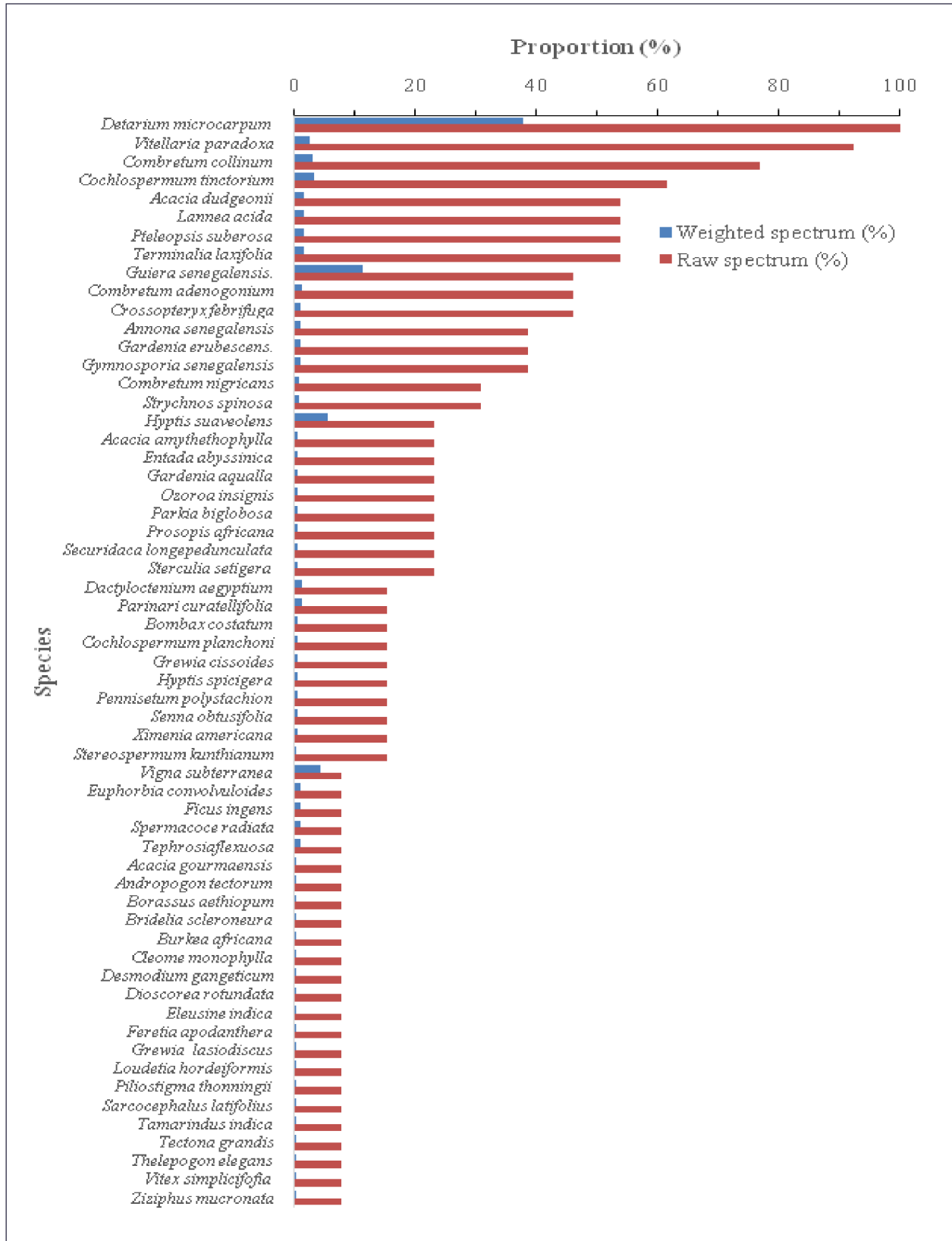


Figure 4: Weighted and Raw Spectrums of the Plant Species in the KCF

Fabaceae is the most diverse and abundant of the families. It accounts for 48.68% and is made up of 14 plant species. Combretaceae follows with 6 species (19.41%). Rubiaceae and Poaceae each have 6 species and Malvaceae has 4 species. The other families are less diverse (Figure 5).

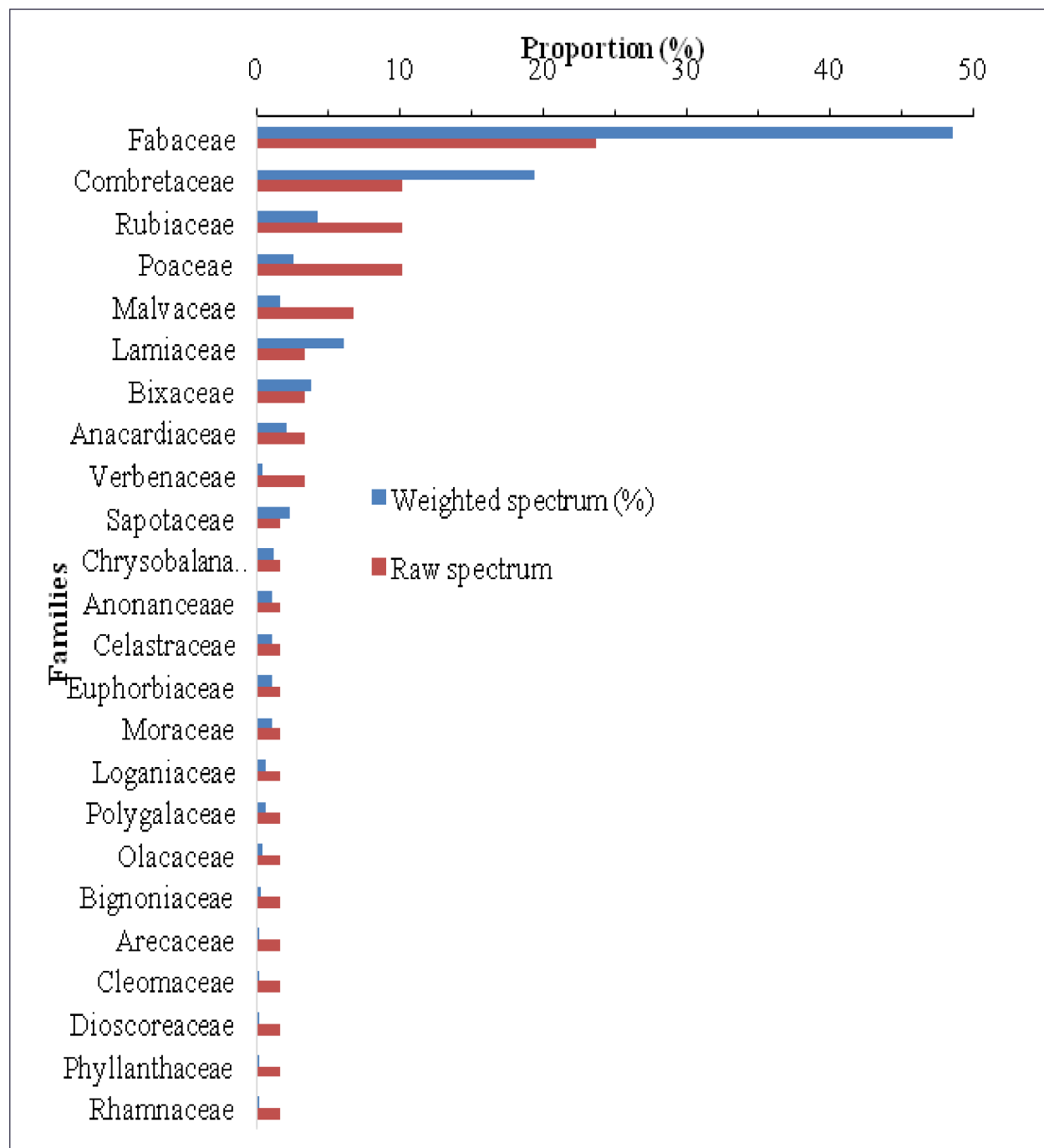
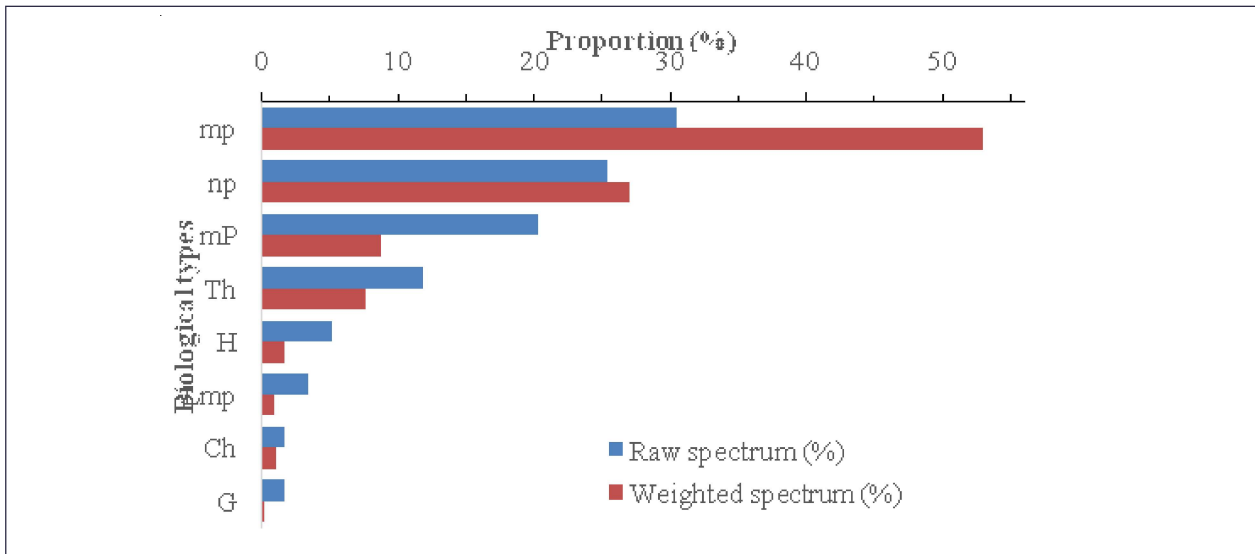


Figure 5: Weighted and Raw Spectrums of Families in the KCF

In the KCF, tree phytogeographical plant species are represented. Soudano-Zambeian species (SZ, 54.24%) were the most common. They were followed by the transitional species (GC-SZ: Guinea-Congolese/Soudano-Zambeian 42.37%). Introduced species were the least represented (I: 3.39%).

The most represented biotypes in the KCF are microphanerophytes and nanophanerophytes (Figure 6). The less diverse and abundant species are the chamephytes and the geophytes.

One endangered species (*Vitellaria paradoxa*) and one near-threatened species (*Terminalia laxifolia Engl.*) were included in the KCF floras. IUCN Red List criteria are not applicable to 38.98%. A proportion of 61.02% of the plants are of least concern.



Note: Ch = chamephyte, G = geophyte, H = hemicryptophyte, Lmp = liana mesophanerophyte, np = nanophanerophyte, mp = microphanerophyte, mP = mesophanerophyte, Th = therophyte.

Figure 6: Weighted and Raw Spectrums of Plant Biological Types in the KCF

3.3. Description of Woody Plant Communities

There were 16 species in the woody plant community of KCF. *Detarium microcarpum* was the most important species (IVIsp = 128.68%). This key species is followed by *Vitellaria paradoxa* (Table 3). The 16 woody species are divided into

Scientific Name	DENR	DOM	FR	IVI
<i>Detarium microcarpum</i> Guill. and Perr.	37.50	6.56	84.62	128.68
<i>Vitellaria paradoxa</i> C.F.Gaertner subsp. <i>paradoxa</i>	12.50	4.80	69.23	86.54
<i>Combretum collinum</i> Fresen.	9.38	1.73	53.85	64.95
<i>Parkia biglobosa</i> (Jacq.) R.Br. ex Benth.	7.81	20.74	30.77	59.32
<i>Lannea acida</i> A.Rich. s.l.	7.03	3.92	46.15	57.11
<i>Entada abyssinica</i> Steud. ex A.Rich.	4.69	33.46	15.38	53.53
<i>Sterculia setigera</i> Delile	4.69	5.84	30.77	41.30
<i>Terminalia laxifolia</i> Engl.	5.47	1.17	30.77	37.41
<i>Acacia dudgeonii</i> Craib ex Holland	4.69	1.66	23.08	29.42
<i>Bombax costatum</i> Pellegr. and Vuillet	1.56	5.41	15.38	22.35
<i>Tamarindus indica</i> L.	1.56	8.67	7.69	17.92
<i>Prosopis africana</i> (Guill. and Perr.) Taub.	0.78	2.92	7.69	11.39
<i>Ficus ingens</i> (Miq.) Miq.	0.78	2.76	7.69	11.23
<i>Parinari curatellifolia</i> Planch. ex Benth.	0.78	0.24	7.69	8.71
<i>Lannea microcarpa</i> Engl. ad K. Krause	0.78	0.12	7.69	8.59

genera and 7 families. The Fabaceae family is the most diverse family with 6 species (Table 4). It is also the most dominant and densest family. As a result, it is so far the most important of the KCF (FIV = 168.54%). Average density was estimated at 99 stems/ha. Mean diameter and basal area were 18.11 cm and 2.53 m²/ha respectively. Mean height was 7.57 m.

Families	DENR	DOM	DIV	FIV
Fabaceae	57.03	74.01	37.5	168.54
Combretaceae	14.84	2.91	18.75	36.50
Anacardiaceae	6.25	11.25	12.5	30.00
Malvaceae	7.81	4.04	12.5	24.35
Chrysobalanaceae	12.50	4.80	6.25	23.55
Moraceae	0.78	2.76	6.25	9.79

3.4. Demographic Structure

There is an inverted J-shape (with $c < 1$) in the distribution of trees by diameter and height classes. The most dominant trees are those with small diameter and height. More than half of the trees are between 5 and 10 m in diameter and between 2 and 4 m in height. They account for 59.69% and 58.14%, respectively.

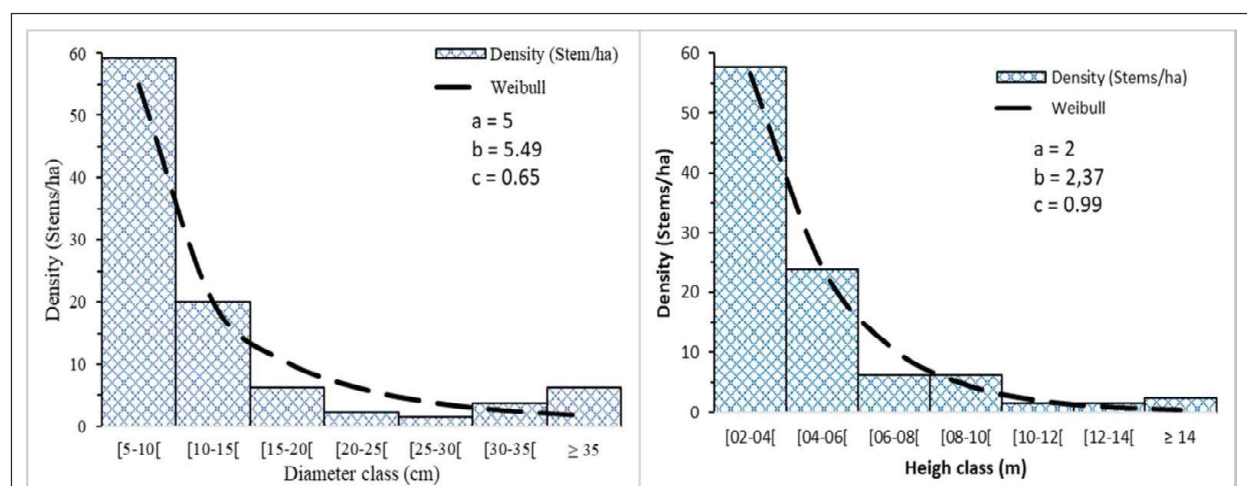


Figure 7: Kouampante Community Forest Woody Plant Diameter and Height Structure

4. Discussion

Between 2010 and 2020, the analysis of Google Earth images of the Kouampante community forest shows a progressive vegetation dynamic. A regression of croplants/fallows to tree/shrub savannahs was observed. This result is comparable to that found in Alibi 1 community forest (Kombate et al., 2023a) and in the Aboudjokopé forest (Egbelou et al., 2021) in the Central Region and the Plateaus Region of Togo respectively. These studies highlighted the contribution of community forest in forest restoration. The progression of tree/shrub savannah in 2020 is due to the protective measures implemented by the community. This could be due to the lasting management of these forest by local communities following reforestation (Atakpama et al., 2022b). Protection against wildfire, plantation of several plants, regulation of human activities and promotion of socioeconomic activities in and around community forests recently by the means of several projects could justify this state (Atakpama et al., 2018; Atakpama et al., 2023b). With the exception of the Abdoulaye wildlife reserve (Atakpama et al., 2021), all protected areas of Togo experience anthropogenic pressure conducting to regression of forest lands (Atakpama et al., 2023d; Polo-Akpisso et al., 2018b; Polo-Akpisso et al., 2015, 2020). The same trends were described in West African protected areas (Biaou et al., 2019; Dimobe et al., 2017).

KCF has an estimated flora diversity of 59. Compared to most other community forests in ecological zones 3, 4 and 5 of Togo (Atakpama et al., 2017; Atakpama et al., 2023a; Folega et al., 2017; Folega et al., 2023; Koumoi, 2023), this

diversity was low. The smaller size of this forest and the climatic conditions of the area may explain this difference. The low rainfall limited the diversity. KCF plant species diversity was comparable to that of Dankpen district (Atakpama et al., 2022b) with a similar climatic conditions.

Globally, the most common families are Fabaceae and Combretaceae. The climatic conditions and vegetation type of the area are confirmed by this finding. Native vegetation was Sudanese savannah with Fabaceae (sometimes thorny *Acacia*) and Combretaceae (Akpagana and Bouchet, 1994; Brunel et al., 1984). This finding was comparable to that of the sacred groves of the Savannahs Region (Atakpama et al., 2021b). In contrast, within the complex of protected areas of Oti-Kéran-Mandouri, located in the same ecological zone, the study of Polo-Akpiisso et al. (2015) showed that the Poaceae were the most represented. This showed that KCF had more woody vegetation. However, the structural characteristics of the woody vegetation showed that there were more young trees in the KCF. Meliaceae (represented mainly by *Azadirachta indica*, an introduced and invasive species), recently described as dominant in ecological zone 1 (Folega et al., 2019b; Folega and Ekoungoulou, 2022) was not present in NCF.

High woody plant abundance was confirmed by high representation of phanerophytic plant species. This was an indication of the reduction of anthropogenic threats in comparison with the protected areas of the zone, which are under high human pressure (Atakpama et al., 2023c; Polo-Akpiisso et al., 2015). Therefore, managing this vegetation in a sustainable way may result in having open forests.

As a feature of the area, the KCF is dominated by Soudano-Zambezi species. This is comparable to several studies in Ecological Zone 1 (Atakpama et al., 2019; Folega and Ekoungoulou, 2022; Polo-Akpiisso et al., 2015). The transitional species were the most abundant in the sacred groves of Savannahs Region and the classified forest of Doungh Pit (Atakpama et al., 2023c; Atakpama et al., 2021b). This showed that the KCF was less humid than the latter two.

Inverted J-shape diametric and height distribution observed in KCF. This suggests a high presence of young individuals in the KCF. It also underlines the recent forest protection measures. This is a consequence of the absence of large diameter trees (Atakpama et al., 2023c). It also suggests the presence of several future stems to ensure that the forest continues to recover (Tsoumou et al., 2016). This condition has been described in several community forests in Togo (Atakpama et al., 2017; Bawa et al., 2022; Folega et al., 2017a; Folega et al., 2017b).

5. Conclusion

Improving ecosystem functionality of community-managed forests is crucial for preserving biodiversity. The present investigation described qualitative vegetation characteristics in Kouampante Community Forest. The spatio-temporal dynamics indicate forest recovery within the Kouampante Community Forest. The originality of the climatic conditions of Ecological Zone 1 was demonstrated by the diversity of the KCF. The most dominant plants are woody species with small diameters and heights. This highlighted the recent measures taken to protect the previously anthropogenic threatened area. It represents an opportunity for restoring the forest. The forest must be enriched with useful and nationally threatened species. Special attention should be paid to fire management, as the ecosystems in the area are vulnerable to forest fires. The study details the ecological characteristics of Kouampante Community Forest in Togo. The findings can serve as a basis for the sustainable use and conservation of community-managed forests in the region.

6. Funding

“This research was funded by the German Federal Ministry of Education and Research (BMBF), through the West Africa Science Service Center on Climate change and Adapted Land Use (WASCAL) program”.

7. Data Availability Statement

WASCAL data is open access and will be made available when a formal request is received by the institution through the Data Administration Unit.

8. Acknowledgment

The authors are grateful to the German Federal Ministry of Education and Research (BMBF) for funding this study under the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) program. We are grateful to all the stakeholders who invested their time and shared their experiences, and to the anonymous reviewers for their careful reading and comments on this manuscript.

9. Conflicts of Interest

The authors declare no conflicts of interest.

References

- Adjonou, K., Kpeli Poukpezi, M., Segla, K.N. and Kokou, K. (2021). Impacts of Traditional Practices on Biodiversity and Structural Characteristics of Sacred Groves in Northern Togo, West Africa. *Acta Oecologica*, 110, 103680. doi: [org/10.1016/j.actao.2020.103680](https://doi.org/10.1016/j.actao.2020.103680)
- Akpagana, K. and Bouehet, P. (1994). Etat Actuel des Connaissances sur la Flore et la Végétation du Togo. *Acta Botanica Gallica*, 141(3), 367–372. doi: [org/10.1080/12538078.1994.10515170](https://doi.org/10.1080/12538078.1994.10515170)
- Assi-Ake, L. (1985). Reviews and Announcements. *Taxon*, 34(4), 739–753. [https://doi: org/10.2307/1222240](https://doi.org/10.2307/1222240)
- Atakpama, W., Agbetanu, K.M.W., Atara, L.L., Biaou, S., Batawila, K. and Akpagana, K. (2021). Biodiversity and Management of Burn Fire within Abdoulaye Wildlife Forest in Togo. *Rev. Sci. Technol., Synthèse*, 27(December), 51–64. Retrieved from doi: <https://www.researchgate.net/publication/357407273%0ABiodiversit%C3%A9>
- Atakpama, W., Akpagana, K. and Pereki, H. (2017). Mapping, diversity and demographic structure of the Amavénou community forest in the Agou prefecture, Togo. *Revue de Géographie de l'Université de Ouagadougou*, 2(6), 59–82. Retrieved from <https://www.researchgate.net/publication/323780249%0ACartographie>
- Atakpama, W., Amegnaglo, K.B., Afelu, B., Folega, F., Batawila, K. and Akpagana, K. (2019). Biodiversity and Pyrophyte Biomass in Togo. *VertigO*, 19(3), 21. doi: <https://doi.org/10.4000/vertigo.27000>
- Atakpama, W., Asseki, E., Kpemissi Amana, E., Koudegnan, C., Batawila, K. and Akpagana, K. (2018). Socio-economic Importance of the Edouwossi-copé Community Forest in the Amou Prefecture of Togo. *Revue Marocaine Des Sciences Agronomiques et Vétérinaires*, 6(1), 55-63.
- Atakpama, W., Badjare, B., Woegan, Y.A., Amouzou, F. komi G, Kpadjao, M. and Akpagana, K. (2022). Ecology of the Sacred Groves of the Tone Prefecture in the Savanes Region of Togo. *Revue Espace Geographique et Societe Marocaine*, 56(January), 23.
- Atakpama, W., Badjare, B., Yawo, E., Aladji, K. and Batawila, K. (2023). Fosse de Doungh au Togo Alarming Degradation of Forest Resources in the Classified Forest of Doungh Pit in Togo. *African Journal on Land Policy and Geospatial Sciences*, 6(May), 2657–2664. [https://doi: org/10.48346/IMIST.PRSM/ajlp-gs.v6i3.39046](https://doi.org/10.48346/IMIST.PRSM/ajlp-gs.v6i3.39046)
- Atakpama, W., Egbelou, H., Folega, F., Afo, C., Batawila, K. and Akpagana, K. (2022). Floristic diversity of community forests in the prefecture of Dankpen, Togo. *Revue Marocaine Des Sciences Agronomiques et Vétérinaires*, 10 (4)(December), 548-557. Retrieved from https://www.agrimaroc.org/index.php/Actes_IAPH2/article/download/1222/1675/
- Atakpama, W., Egbelou, H., Kombate, B., Biaou, S. and Batawila, K. (2023). Diversity and Structure of Plant Formations in the Alibi-1 Community Forest in Togo. *Rev. Sci. Technol., Synthèse*, 29(1), 06-20. Retrieved from <https://www.researchgate.net/publication/376613510%0ADiversit%C3%A9>
- Atakpama, W., Egbelou, H., Samarou, M. and Fousseni, F. (2023). Community forestry in Togo: Where do we stand?. *Revue Marocaine Des Sciences Agronomiques et Vétérinaires*, 11(December), 532-543. doi: <https://doi.org/10.5281/zenodo.10479185>
- Atakpama, W., Egbelou, H., Yandja, M., Kombate, B., Afelou, B., Batawila, K. and Akpagana, K. (2023). Vulnerability of the flora of the Missahohé Classified Forest to Wildfire. *Ann. Rech. For. Algerie*, 13(01), 37–53. Retrieved from <https://www.asjp.cerist.dz/en/article/219328#:~:text=Les r%C3%A9sultats r%C3%A9v%C3%A9lent une augmentation,jach%C3%A8res entre 2000 et 2020.>
- Atakpama, W., Folega, F., Kpadjao, M.-E. and Amouzou, F. komi G. (2021). Challenge of sustainable management of biodiversity of sacred groves of the Region of Savannas in Togo. *Rev. Sci. Technol., Synthèse*, 27(1), 22-32. Retrieved from https://www.researchgate.net/profile/Wouyo-Atakpama/publication/357395577_Problematique_de_gestion_durable_de_la_biodiversite_des_bosquets_sacres_de_la_Region_des_Savanes_au_Togo/links/61d360d6b8305f7c4b1edac6/Problematique-de-gestion-durable-de-la-biodiv
- Badjare, B., Woegan, Y. A., Folega, F. and Atakpama, W. (2021). (2021). Vulnerability of woody resources in relation to different forms of use in togo. *Revue Agrobiologia*, 11(2), 2552-2565. Retrieved from https://www.researchgate.net/publication/357402393_Vulnerabilite_Des_Ressources_Ligneuses_En_Lien_Avec_Les_Differentes_Formes_

D'usages_Au_Togo_Cas_Du_Paysage_Des_Aires_Protegees_Doungh-fosse_Aux_Lions_region_Des_Savanes

- Bawa, D.M., Wala, K., Folega, F. and Akpagana, K. (2022). Floristic and structural characteristics of the Agbandi Community Forest in Central Togo (West Africa). *Rev Écosystèmes et Paysages (Togo)*, 02(july), 55-74. Retrieved from <https://www.researchgate.net/publication/361972927%0ACaractéristiques>
- Baynes, J., Herbohn, J., Smith, C., Fisher, R. and Bray, D. (2015). Key Factors Which Influence The Success of Community Forestry in Developing Countries. *Global Environmental Change*, 35, 226–238. <https://doi.org/10.1016/j.gloenvcha.2015.09.011>
- Beukeboom, H.J., Van der Laan, C., Van Kreveld, A. and Akwah, G. (2010). *Can Community Forestry Contribute to Livelihood Improvement and Biodiversity?*, Retrieved from https://biblioteca.biofund.org.mz/wp-content/uploads/2018/11/1542796654-F1642._BeukeboomEtAl.,2010.Pdf
- Bhusal, P., Paudel, N.S., Adhikary, A., Karki, J. and Bhandari, K. (2018). Halting Forest Encroachment in Terai: What Role for Community Forestry? *Journal of Forest and Livelihood*, 16(1), 15–34. <https://doi.org/10.3126/jfl.v16i1.22880>
- Biaou, S., Houeto, F., Gouwakinnou, G., Honoré, S.S., Biaou, S., Houeto, F., ... Awes-, B. (2019). Spatio-temporal Dynamics of Land use in the Ouénou-Bénou Classified Forest in Northern Benin In Hal-02189367 (pp. 1-20). Retrieved from <https://hal.science/hal-02189367>
- Brunel, J.F., Hiepko, P. and Scholz, H. (1984). Analytical flora of Togo: Phanerogams. *Englera*, (4), 3-751. doi: <https://doi.org/10.2307/3776742>
- Dimobe, K., Goetze, D., Ouédraogo, A., Forkuor, G., Wala, K., Porembski, S. and Thiombiano, A. (2017). Spatio-Temporal Dynamics in Land Use and Habitat Fragmentation within a Protected Area Dedicated to Tourism in a Sudanian Savanna of West Africa. *Journal of Landscape Ecology (Czech Republic)*, 10(1), 75–95. <https://doi.org/10.1515/jlecol-2017-0011>
- Dimobe, K., Wala, K., Batawila, K., Dourma, M., Woegan, Y.A. and Akpagana, K. (2012). Spatio-Temporal Dynamics in Land Use and Habitat Fragmentation within a Protected Area Dedicated to Tourism in a Sudanian Savanna of West Africa (Togo). *Vertigo*, (Hors-série 14). doi: <https://doi.org/10.4000/vertigo.12423>
- Egbelou, H., Atakpama, W., Dourma, M. and Akpagana, K. (2021). Spatio-temporal Dynamics and Flora of the Aboudjokopé forest in Togo. *Rev. Sci. Technol., Synthèse*, 27(December), 37–50. Retrieved from <https://www.bing.com/ck/a?!&p=34a6abd2c71489d6JmltdHM9MTcwNzYwOTYwMCZpZ3VpZD0yMWZhOGNkOC03YWFKLTYzY2MtMWM3NC05ZGQxN2JiMDYyMTUmaW5zaWQ9NTE5Mg&ptn=3&ver=2&hsh=3&fclid=21fa8cd8-7aad-63cc-1c74-9dd17bb06215&psq=Dynamique+spatio-temporelle+et+flore+de+la+forêt>
- Ehlui, K.S., Atakpama, W., von Wehrden, H., Bah, A., Kola, E., Anthony-Krueger, C., ... Boukpepsi, T. (2024a). Anthropogenic Threats to Degraded Forest Land in the Savannahs' Region of Togo from 1984 to 2020, West Africa. *Journal of Geoscience and Environment Protection*, 12(1), 164–179. <https://doi.org/10.4236/gep.2024.121011>
- Ehlui, K.S., Bah, A., Atakpama, W., Anthony-krueger, C., Kola, E., von Wehrden, H. and Boukpepsi, T. (2024b). Mapping and Floristic Diversity of the Nakpadjouak Community Forest, Tami Canton, Togo (West Africa). *Natural Resources*. <https://doi.org/10.20944/preprints202401.1562.v1>
- Ern, H. (1979). Hartmut Ern Source: *Willdenowii*, 9, 295–312. Retrieved from <http://www.jstor.org/stable/3995654> Accessed:
- Folega, A.A., Folega, F., Woegan, Y., Wala, K. and Akpagana, K. (2021). Dynamics of greenhouse gas emissions linked to the forestry sector and other land uses (FAT) in the Eburnéen basement landscape in Togo. *Rev Écosystèmes et Paysages (Togo)*, 01(01), 58(December). Retrieved from https://www.researchgate.net/publication/357187888_Dynamique_des_émissions_de_gaz_a_effet_de_serre_liées_au_secteur_foresterie_et_autres_affectations_des_terres_FAT_dans_le_paysage_du_socle_Eburnéen_au_Togo_Dynamics_of_greenhouse_gas_emissions_linked
- Folega, F., Atakpama, W., Kanda, M., Wala, K., Batawila, K. and Akpagana, K. (2019). Agroforestry Parklands and Carbon Sequestration In Tropical Sudanesse Region of Togo. *Rev. Mar. Sci. Agron. Vét.*, 7(4), 563–570. Retrieved from https://www.agrimaroc.org/index.php/Actes_IAPH2/article/download/745/939/
- Folega, F., Atakpama, W., Pereki, H., Djiwa, O., Dourma, M., Kombate, B., ... Akpagana, K. (2017). (2017). Ecological and socio-economic potential of the Agbedougbe community forest (Plateaux region, Togo). *Journal de La Recherche Scientifique de l'Université de Lomé*, 19(2), 31–50. Retrieved from <https://www.researchgate.net/publication/>

325876978_Potentialites_ecologiques_et_socio-economiques_de_la_foret_communautaire_d'agbedougbe_region_des_Plateaux-Togo?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6ImhvWUUiLCJwYWdlIjoic2VhcmNoIiwicG9zaXRpb24iOiJwYWdlSGVhZ

- Folega, F., Atakpama, W., Wala, K., Mukete, B., Shozo, S., Akira, O., ... Akpagana, K. (2019). Land Use Patterns and Tree Species Diversity in the Volta Geological Unit, Togo. *Journal of Mountain Science*, 16(8), 1869–1882. <https://doi.org/10.1007/s11629-018-5154-4>
- Folega, F., Badjare, B., Tchabi, M., Kamara, M., Atakpama, W., Issifou, A., ... Akpagana, K. (2023). Land Use Change and the Structural Diversity of Affem Boussou Community Forest in the Tchamba 1 Commune (Tchamba Prefecture, Togo). *Conservation*, 3(3), 346–362. <https://doi.org/10.3390/conservation3030024>
- Folega, F. and Ekoungoulou, R. (2022). Paysage du socle éburnéen au Togo Diversité structurale des ligneux en lien avec l'utilisation des terres en paysage du socle éburnéen au Togo. *Ann. Rech. For. Alge Rie*, 12(1), 7–25. Retrieved from <https://www.researchgate.net/publication/359369285>
- Folega, F., Marra, D., Wala, K., Batawila, K., Zhang, C. yu, Zhao, X. hai and Akpagana, K. (2012). Assessment and Impact of Anthropogenic Disturbances in Protected Areas of Northern Togo. *Forestry Studies in China*, 14(3), 216–223. <https://doi.org/10.1007/s11632-012-0308-x>
- Folega, F., Pereki, H., Woegan, Y.A., Dourma, M., Atakpama, W., Maza, M. S. and Akpagana Koffi. (2017). Eburnian basement landscape in Togo Structural diversity of woody plants in relation to land use in the Eburnian basement landscape in Togo.19(3), 47-61. Retrieved from <https://www.researchgate.net/publication/323547726%0ACharacterisation>
- Giri, P.B., Yucharoen, M., Gyawali, S. and Gentle, P. (2023). Implementing SDG-15 Through Community Forestry Management A Case of Tarpakha Community Forest, Gorkha, Nepal. *Environment Asia*, 16(2), 1–11. <https://doi.org/10.14456/ea.2023.16>
- Ibrahim-naim, R.A., Atakpama, W., Bessan, A.K. and Liyabin, N. (2021). Floristic diversity and fodder biomass of potential grazing land of the Eburnean basement in Togo. *Écosystèmes et Paysages (Togo)*, 01(1), 12–29. Retrieved from <https://lbev-univlome.com/revue-ecosysteme-et-paysage/>
- Kebezikato, A.B., Atakpama, W., Samarou, M., Wala, K., Batawila, K. and Akpagana, K. (2023). Socio-economic Importance of the Baobab (*Adansonia digitata*) in Togo. *Rev. Mar. Sci. Agron. Vét.*, 11(3), 294–302. <https://doi.org/https://doi.org/10.5281/zenodo.8278018>
- Kebezikato, A.B., Wala, K., Dourma, M., Atakpama, W., Dimobe, K., Pereki, H.(2014). Distribution and Structure of *Adansonia Digitata* L.(baobab) Parks in Togo (West Africa). *Afrique Science*, 10(2), 434-449. Retrieved from <http://www.ajol.info/index.php/afsci/article/view/109682>
- Kokou, K.B., Atakpama, W., Kombate, B., Egbelou, H. and Koffi, N.A. (2023). Dynamics and modelling of the carbon stock of the Amou-Mono Classified Forest in Togo. 3(2), 1–16. doi: <https://doi.org/10.59384/recopays.tg3211>
- Kombate, B., Atakpama, W., Egbelou, H., Ahuide, K., Dourma, M., Folega, F., ... Akpagana, K. (2023). Land use Dynamics and Carbon Modelling of the Alibi 1 Community Forest. *Annale de La Recherche Forestière En Algérie*, 12(2), Sous presse. Retrieved from https://www.researchgate.net/publication/370316919_Dynamique_de_l'occupation_de_sol_et_modelisation_du_carbone_de_la_Foret_Communautaire_d'Alibi_1
- Kombate, B., Atakpama, W., Egbelou, H., Yandja, M., Bawa, A., Dourma, M., ... Akpagana, K. (2023). Carbon structure and modelling of the Missahohé Classified Forest in Togo. *African Journal on Land Policy and Geospatial Sciences*, 6(1), 42-61., 6(1), 42–61. <https://doi.org/10.48346/IMIST.PRSM/ajlp-gs.v6i1.35320>
- Konko, Y., Rudant, J. P., Akpamou, G. K., Noumonvi, K. D. and Kokou, K. (2018). Spatio-Temporal Distribution of Southeastern Community Forests in Togo (West Africa). *Journal of Geoscience and Environment Protection*, 06(07), 51–65. <https://doi.org/10.4236/gep.2018.67004>
- Kossi, M., Fousséni, F., Agbelessissi, W.Y., Wouyo, A., Hodabalo, P., Kperkouma, W. and Koffi, A. (2022). State and spatio-temporal dynamics of the Edouwossi - Copé community forest, Plateaux Region, Togo, 02(01), 12–26. Retrieved from https://www.researchgate.net/publication/361968968_Etat_et_dynamique_spatio-temporelle_de_la_foret_communautaire_d'Edouwossi-Cope_Region_des_Plateaux-Togo?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InNlYXJjaCIsInBhZ2UiOiJwYWdlIiwicG9zaXRpb24iOiJwYWdlSGVhZ2VIZWVhZSI6ImhvWUUiLCJwYWdlIjoic2VhcmNoIiwicG9zaXRpb24iOiJwYWdlSGVhZ

- Koumoui, Z. (2023). Mapping and floristic characterisation of the Edzi Hado community forest in the Avé prefecture, Maritime Region (Togo). *Revue Ecosystèmes et Paysages (Togo)*, 3(1). <https://doi.org/10.59384/recopays2023-3-1>
- Moayeri, M., Abedi, A., Mohammadreza, S. and Mastouri, A. (2022). Detection of Social Forestry Approaches and Its Impact on Managing Forestry Plans in Golestan Province. *Journal of Wood and Forest Science and Technology*, 28(4), 1–28. <https://doi.org/10.22069/JWFST.2022.19546.1944>
- Musyoki, J.K., Mugwe, J., Mutundu, K. and Muchiri, M. (2016). Factors Influencing Level of Participation of Community Forest Associations in Management Forests in Kenya. *Journal of Sustainable Forestry*, 35(3), 205–216. <https://doi.org/10.1080/10549811.2016.1142454>
- Padakale, E., Atakpama, W., Dourma, M., Dimobe, K., Wala, K., Guelly, K. and Akpagana, K. (2015). Woody Species Diversity and Structure of *Parkia Biglobosa* Jacq. Dong Parklands in the Sudanian Zone of Togo (West Africa). *Annual Research & Review in Biology*, 6(2), 103–114. <https://doi.org/10.9734/arrb/2015/14105>
- Polo-Akpisso, A., Folega, F., Ouattara, S., Wouyo, A., Mamadou, C., Walla, K., ... Yao, T. (2018b). Habitat Biophysical and Spatial Patterns Assessment Within Oti-Keran-Mandouri Protected Area Network in Togo. *International Journal of Biodiversity and Conservation*, 10(5), 214–229. <https://doi.org/10.5897/ijbc2017.1139>
- Polo-Akpisso, A., Folega, F., Soulemene, O., Atakpama, W., Coulibaly, M., Wala, K., ... Yao, T. (2018a). Habitat Biophysical and Spatial Patterns Assessment within Oti-Keran-Mandouri protected area network in Togo. *International Journal of Biodiversity and Conservation*, 10(5), 214–229. <https://doi.org/10.5897/ijbc2017.1139>
- Polo-Akpisso, A., Wala, K., Ouattara, S., Woegan, Y., Coulibaly, M., Atato, A., ... Akpagana, K. (2015). Plant Species Characteristics and Woody Plant Community Types within the Historical Range of Savannah Elephant, *Loxodonta africana* Blumenbach 1797 in Northern Togo (West Africa). *Annual Research & Review in Biology*, 7(5), 283–299. <https://doi.org/10.9734/arrb/2015/19271>
- Polo-Akpisso, A., Wala, K., Soulemene, O., Folega, F., Akpagana, K. and Tano, Y. (2020). Assessment of Habitat Change Processes within the Oti-Keran-Mandouri Network of Protected Areas in Togo (West Africa) from 1987 to 2013 Using Decision Tree Analysis. *Sci*, 2(1). <https://doi.org/10.3390/sci2010001>
- Samarou, M., Atakpama, W., Fousseni, F., Dourma, M., Wala, K., Batawila, K. and Akpagana, K. (2022). Ecological and structural characterisation of tamarind parks (*Tamarindus indica* L., Fabaceae) in the Sudanian zone of Togo (West Africa). *Rev Écosystèmes et Paysages*, 02(July), 109–125. Retrieved from https://agrimaroc.org/index.php/Actes_IAPH2/article/view/1155
- Samarou, M., Lekeriba, N., Atakpama, W. and Komlan, B. (2023). Diversity and economic importance of woody plants used for forest landscape restoration in the Maritime region of Togo. *Revue Ecosystèmes et Paysages*, 3(1), 149–166. <https://doi.org/10.59384/recopays2023-3-1>
- Thiombiano, A., Glèlè-Kakai, R., Bayen, P., Boussim, J.I. and Mahamane, A. (2015). Forest inventory methods and systems in West Africa: current situation and proposals for harmonisation. *Annales Des Sciences Agronomiques*, 19(April), 15–31. Retrieved from <https://www.researchgate.net/publication/301327616%0AMÉTHODES>
- Tsoumou, B.R., Lumandé, K.J., Kampé, J.P. and Nzila, J.D. (2016). Estimation of the quantity of carbon sequestered by the Dimonika Model Forest (south-west of the Republic of Congo). *Revue Scientifique et Technique Forêt & Environnement Du Bassin Du Congo*, 6(Avril), 39-45. Retrieved from <https://dicames.online/jspui/handle/20.500.12177/1902>
- West, P.W. (2004). *Tree and Forest Measurement*. *Tree and Forest Measurement*, (3rd ed., Vol. 3). Lismore: Springer. <https://doi.org/10.1007/978-3-662-05436-9>
- White, F. (1986). *The vegetation of Africa*. Paris: ORSTOM-UNESCO.
- Wulandari, C., Budiono, P. and Iswandaru, D. (2021). Importance of Social Characteristic Of Community To Support Restoration Program In Protection Forest. *Indonesian Journal of Forestry Research*, 8(2), 173–186. <https://doi.org/10.20886/ijfr.2021.8.2.173-186>

Appendix A

List of Plant Species within Kouampante Community Forest (NCF)

Table A1: List of Plant Species Within Kouampante Community Forest (KCF) in Togo			
Species	Families	TP	TB
<i>Acacia amythethophylla</i> Steud. ex A. Rich.	Fabaceae	SZ	mP
<i>Acacia dudgeonii</i> Craib ex Holland	Fabaceae	SZ	mp
<i>Acacia gourmaensis</i> A.Chev.	Fabaceae	SZ	mp
<i>Andropogon tectorum</i> Schumach. & Thonn.	Poaceae	GC-SZ	H
<i>Annona senegalensis</i> Pers.	Anonanceae	GC-SZ	np
<i>Bombax costatum</i> Pellegr. & Vuillet	Malvaceae	SZ	mP
<i>Borassus aethiopicum</i> Mart.	Arecaceae	GC-SZ	mP
<i>Bridelia scleroneura</i> Müll.Arg.	Phyllanthaceae	SZ	np
<i>Burkea africana</i> Hook.	Fabaceae	SZ	mp
<i>Cleome monophylla</i> L.	Cleomaceae	GC-SZ	Th
<i>Cochlospermum planchonii</i> Hook.f.	Bixaceae	SZ	np
<i>Cochlospermum tinctorium</i> A.Rich.	Bixaceae	SZ	np
<i>Combretum adenogonium</i> Steud. ex A.Rich.	Combretaceae	SZ	mp
<i>Combretum collinum</i> Fresen.	Combretaceae	SZ	mp
<i>Combretum nigricans</i> Lepr. ex var. <i>elliotii</i> (Engl. & Diels) Aubrev.	Combretaceae	GC-SZ	mP
<i>Crossopteryx febrifuga</i> (G.Don) Benth.	Rubiaceae	GC-SZ	mp
<i>Dactyloctenium aegyptium</i> (L.) Willd.,	Poaceae	GC-SZ	H
<i>Desmodium gangeticum</i> (L.) nc. var. <i>gangeticum</i>	Fabaceae	GC-SZ	np
<i>Detarium microcarpum</i> Guill. & Perr.	Fabaceae	SZ	mp
<i>Dioscorea rotundata</i> Poir.	Dioscoreaceae	GC-SZ	G
<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	GC-SZ	H
<i>Entada abyssinica</i> Steud. ex A.Rich.	Fabaceae	GC-SZ	Lmp
<i>Euphorbia convolvuloides</i> Hochst. ex Benth.	Euphorbiaceae	SZ	Ch
<i>Feretia apodanthera</i> Delile ssp. <i>apodanthera</i>	Rubiaceae	SZ	mp
<i>Ficus ingens</i> (Miq.) Miq.	Moraceae	SZ	mp
<i>Gardenia aqualla</i> Stapf & Huteh.	Rubiaceae	GC-SZ	np
<i>Gardenia erubescens</i> Stapf & Huteh.	Rubiaceae	GC-SZ	np
<i>Grewia lasiodiscus</i> K. Schum.	Malvaceae	SZ	mp
<i>Grewia cissoides</i> Hutch. & Dalziel	Malvaceae	SZ	mp

Appendix A (Cont.)

Species	Families	TP	TB
<i>Guiera senegalensis</i> J.F.Gmel.	Combretaceae	SZ	np
<i>Gymnosporia senegalensis</i> (Lam.) Loes.	Celastraceae	SZ	np
<i>Hyptis spicigera</i> Lam.	Lamiaceae	SZ	np
<i>Hyptis suaveolens</i> (L.) Poit.	Lamiaceae	GC-SZ	np
<i>Lannea acida</i> A.Rich. s.l.	Anacardiaceae	GC-SZ	mP
<i>Loudetia hordeiformis</i> (Stapf) C.E.Hubbard	Poaceae	GC-SZ	T h
<i>Ozoroa insignis</i> Delile	Anacardiaceae	SZ	np
<i>Parinari curatellifolia</i> Planch. ex Benth.	Chrysobalanaceae	SZ	mp
<i>Parkia biglobosa</i> (Jacq.) R.Br. ex Benth.	Fabaceae	GC-SZ	mP
<i>Pennisetum polystachion</i> (L.) Sehult. <i>polystachion</i>	Poaceae	GC-SZ	T h
<i>Piliostigma thonningii</i> (Schumach.) Milne-Redh.	Fabaceae	GC-SZ	np
<i>Prosopis africana</i> (Guill. & Perr.) Taub.	Fabaceae	SZ	mP
<i>Pteleopsis suberosa</i> Engl. & Diels	Combretaceae	SZ	mp
<i>Sarcocephalus latifolius</i> (Sm.) E.A.Bruce	Rubiaceae	GC-SZ	Lmp
<i>Securidaca longepedunculata</i> Fresen.	Polygalaceae	SZ	mp
<i>Senna obtusifolia</i> (L.) H.S.Irwin & Barneby	Fabaceae	GC-SZ	np
<i>Spermacoce radiata</i> (DC.) Hiem	Rubiaceae	GC-SZ	T h
<i>Sterculia setigera</i> Delile	Malvaceae	SZ	mP
<i>Stereospermum kunthianum</i> Cham.	Bignoniaceae	SZ	mP
<i>Strychnos spinosa</i> Lam.	Loganiaceae	SZ	mP
<i>Tamarindus indica</i> L.	Fabaceae	GC-SZ	mP
<i>Tectona grandis</i> L.f.	Verbenaceae	I	mP
<i>Tephrosia flexuosa</i> G.Don	Fabaceae	GC-SZ	T h
<i>Terminalia laxifolia</i> Engl.	Combretaceae	SZ	mp
<i>Thelepogon elegans</i> Roth ex Roem.	Poaceae	SZ	T h
<i>Vigna subterranea</i> (L.) Verde.	Fabaceae	I	T h
<i>Vitellaria paradoxa</i> C.F.Gaertner subsp. i	Sapotaceae	SZ	mP
<i>Vitex simplicifolia</i> Oliv.	Verbenaceae	SZ	np
<i>Ximenia americana</i> L.	Olacaceae	GC-SZ	mp
<i>Ziziphus mucronata</i> Willd.	Rhamnaceae	SZ	mp

Cite this article as: Kossi Senyo Ehlui, Alagie Bah, Wouyo Atakpama, Henrik von Wehrden, Christian Anthony-Krueger, Edinam Kola and Tchaa BoukpeSSI (2024). [Dynamics and Floristic Structure of Kouampante Community Forest \(Savannahs' Region, Togo\)](#). *International Journal of Agricultural Sciences and Technology*. 4(1), 27-42. doi: 10.51483/IJAGST.4.1.2024.27-42.