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FOREST CONSERVATION IN THE AKYEM ABUAKWA KINGDOM IN GHANA'S EASTERN REGION: AN ENVIRONMENTAL HISTORY

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Abstract: Since the 1970s, the Akyem Abuakwa Kingdom in Ghana's Eastern Region has attracted scholarly attention, largely focused on its social and political history. However, little attention has been paid to the historical development of forest conservation from the pre-colonial era to the present. The present study addresses this gap and contributes to Ghana's environmental historiography. Using archival sources, oral traditions, colonial records, and secondary literature, the research traces changing conservation practices across pre-colonial, colonial, and postcolonial periods. The findings show that indigenous environmental ethics and traditional institutions played a central role in regulating forest use and protecting natural resources. Over time, these systems have come under significant strain due to commercial agriculture, illicit mining, deforestation, and the weakening of traditional authority, particularly since colonial rule. The study argues that these combined pressures have undermined sustainability and calls for renewed attention to indigenous conservation frameworks in contemporary environmental policy.

Keywords: Akyem Abuakwa Traditional Area, environmental conservation, indigenous conservation practices, cultural heritage, Akan societies

Introduction

In the seventeenth century, a group of exiles from Adanse, commanded by Ofori Panin, established themselves in the region north of the Birem River, currently known as Akyem Abuakwa (Wilks 1957). Upon their arrival, the majority of present-day Akyem Abuakwa was incorporated inside the Akwamu Empire, which had its capital at Nyanoase. Asamankese was a significant

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town, subordinate only to the king of Akwamu (Addo-Fening 1975). The Akyem established themselves on the western frontier of the Akwamu Empire, and from the mid-seventeenth century on, they began to jeopardise the empire's integrity through a succession of raids into its northern territories. The Akyem maintained pressure on the northwestern boundary until 1730, when, in collaboration with discontented people of Akwamu, they conquered the whole western region of the empire, including the original Akwamu territory, which was lost to the Akwamu (Addo-Fening 1975). The subjugated territories were thereafter apportioned between Kotoku and Abuakwa, with the largest share allocated to the latter. Over a span of seventy years, certain members of the Asona family groups migrated from the Banso region to the vacated territories, accompanied by some immigrants from Adanse.

This made the Akyem Abuakwa Traditional Area one of the areas in the Eastern Region that possesses abundant natural, biological, cultural, and historical assets with the potential to be transformed into tourist destination sites in Ghana (CONTRAD and P & H Consultants 2005). The area has a striking topography, ancient artefacts, and customary practices. The traditional area features abundant renewable natural resources including forests, waterfalls, rivers, and a diverse range of wildlife and sanctuaries. The territorial boundaries of the Abuakwa Traditional Area encompassed the region stretching from the eastern banks of the River Pompom to the western banks of the Pra River. In the northern direction, the kingdom expanded from the Kwahu border, while in the southern direction, it reached as far as the Densu River. The consolidation of these territories occurred under the Abuakwa land tenure system (Addo-Fening 1980).

In recent decades the global emphasis on the preservation, safeguarding, and management of native and sacred sites has intensified due to their importance for sustainable livelihoods, recreation, and scientific research, and because of the intimate interdependence between local communities and their environments (Chandran and Hughes 2000). Across Ghana and other indigenous contexts, scholarship demonstrates that long before the advent of formal state forestry regimes, forest conservation was embedded in cultural norms, cosmological beliefs, and customary institutions that regulated access to land and natural resources. Among Akan societies in particular, taboos, sacred groves, ritual prohibitions, myths, proverbs, and ancestral sanctions functioned as effective conservation mechanisms by controlling exploitation and linking ecological transgressions to social and spiritual consequences (Asante, Ababio and Boadu 2017; Adom, Kquofi and Asante 2018). Conversely, rising deforestation has been associated with agricultural expansion, mining, population pressures, the increasing

scarcity of certain herbal remedies and the erosion of Indigenous authority under centralised, top-down conservation policies that marginalise local custodianship (Kwawuvi, Bessah and Owusu 2018). These dynamics reflect broader global critiques of exclusionary "wilderness" models that disregard the historical role of Indigenous peoples in shaping and sustaining biodiverse landscapes (Fletcher et al. 2021), and reinforce arguments that sustainable environmental management depends on recognising Indigenous land rights, knowledge systems, and worldviews as integral to conservation practice (Ahammad et al. 2026). Therefore, academic literature widely acknowledges that effective environmental management and the safeguarding of cultural heritage, including traditional institutions and oral traditions are essential to sustainable community development (Ojomo 2010). It is within this analytical framework that this study examines how the people of the Akyem Abuakwa Kingdom in the Eastern Region of Ghana conserved their forests from the pre-colonial through the post-colonial period.

Sources and Methods

This study employed a qualitative methodology grounded in the interpretative research philosophy to examine forest conservation in the Akyem Abuakwa Kingdom from the pre-colonial to the post-colonial period. Given that indigenous conservation practices are embedded in cultural norms, customary law, and spiritual beliefs, an interpretative approach was appropriate for reconstructing meanings and institutional change over time. The research adopted environmental history and ethnohistorical approaches, combining chronological analysis with institutional and legal analysis to trace continuity and transformation in indigenous strategies and colonial forestry legislation in the Gold Coast. The study was organised under four themes: a brief history of Akyem Abuakwa, indigenous conservation techniques, colonial forest legislation, and post-colonial ecological degradation.

Primary archival documents were meticulously gathered from the Public Records and Archives Administration Department in Accra. Data were also collected from relevant secondary literature, and from semi-structured interviews with purposively selected participants from six communities, including traditional authorities and herbal practitioners. Most participants were over sixty years old, reflecting the study's historical focus, and participant selection was based on knowledge of conservation practices across historical periods. The semi-structured format allowed probing of emerging themes and clarification of historical accounts.

Data analysis involved rigorous source criticism, thematic coding, and narrative reconstruction. Archival documents were assessed for authenticity and bias, while oral testimonies were cross-checked with documentary evidence to ensure triangulation. Ethical standards were strictly observed: informed consent was obtained, confidentiality assured where necessary, and cultural protocols respected in engaging traditional authorities. These procedures ensured methodological rigour, credibility, and cultural sensitivity.

Figure 1. Study Area

Source: Adapted from Ofosu-Mensah, The Economic, Social and Political Impact of Mining on Akyem Abuakwa from the Pre-Colonial Era up to 1943 (2017)

Geographical Features of Akyem Abuakwa

An elevated evergreen forest primarily covers Akyem Abuakwa, which is located in the high forest zone. The mountain range features north-to-south-oriented plateaus, with a maximum elevation of 842 meters above sea level. The Akyem Abuakwa forest consists of two distinct forest blocks: the Atewa Range, which spans 237 km2, and the Atewa Range Expansion, which spans 21.3 km2 (Kusimi 2015).

The Atewa Forest is situated at the eastern extremity of the Upper Guinea forest eco-region. The Upper Guinea forest refers to the moist woods located in West Africa, stretching from Senegal to the Dahomey Gap in Togo and Benin (Oboli and Church 1965). The Upper Guinea forest eco-region is acknowledged as a location with a high level of unique species, including birds, and is considered a global hotspot for biodiversity.

Lying within an area of high rainfall, Abuakwa is heavily forested and some of the very steep slopes still maintain their original high forest vegetation (see Figure 1). The forest experiences an average annual precipitation of approximately 1650 mm. The rainfall in the forest follows a bimodal distribution, meaning it has two distinct peaks. The wet seasons comprise a primary period from May to July and a secondary period from September to October or November. The forest gives way to three rivers that etch a radial pattern into the surrounding landscape. The Birem River functions as the primary water source for the eastern region of Ghana, ultimately merging with the Pra Basin, a significant river that serves the western region. The Ayensu River originates in the eastern region and ends in the Ghana's central region. The Densu River feeds the Densu Basin and the Weija Reservoir, which is the primary source of potable water for most of Accra (Lawer et al. 2020).

A great deal of different plants and animals live in Akyem Abuakwa forest. Some of the rarest and most interesting species are the Atewa dotted butterfly (*Mylothris Atewa*), the Colobus monkey (Colobus Vellerosus), and the large-headed shrew (*Crocidura Grandiceps*) (McCullough et al. 2007). The forest reserve has confirmed the existence of fourteen non-flying small mammal species, including rats and shrews. Two of these species, C. Grandiceps and C. Wimmeri, are currently under the endangered species classification (Weber and Fahr 2007). The Forest Reserve of Akyem Abuakwa is home to several plant species including Odum (*Milicia execlsa (Welw.) C.C. Berg*), Mahogany (*Khaya ivorensis (A. Chev*), and Wawa (*Triplochiton Scleroxylon*).

Certain parts of the reserve include significant deposits of gold and bauxite, which have drawn the interest of both large mining companies and individuals engaged in small-scale and traditional mining operations, in addition to its rich variety of plant and animal species (Lawer et al. 2020). Chainsaw milling, also referred to as logging, is a prevalent practice in the reserve. The success of these initiatives can vary due to the uneven distribution of mineral resources and commercially viable timber species. The use of these resources is often more significant in areas with higher concentrations of mineral reserves and valuable, marketable trees.

Akyem Abuakwa has a high degree of soil fertility, rendering it conducive to cultivating some of the most sought-after food and crops in the traditional state. The region in which it is situated is characterised by a dense tropical forest that has maintained its lushness since ancient times, leading to the Okyenhene (title of the King of Akyem Abuakwa) being bestowed with the honorary title of Kwaebibiremhene (King of the Black Forest) (Kwakye 2007).

The Akyem Abuakwa people are a subset of the Akan people, a meta-ethnicity in Ghana and Ivory Coast, and the most populous ethnic group in Ghana. They traditionally practice a religion that focuses on the Supreme Being, ancestors, lower divinities, and spiritual entities. The living are believed to live under the watch of ancestors, who can punish and reward them. Blood is closely connected to kinship, and a blood covenant binds the dead, living, and future family members. To avoid supernatural punishment, the Akan seek to restore a broken relationship with the spirit world through sacrifices, with a traditional priest serving as mediator. At the onset of the colonial era, Akyem Abuakwa had attained a notable status as an Akan kingdom that had successfully maintained its sovereignty without being subjugated by any other traditional kingdom. Throughout Akyem Abuakwa's history, several battles have been both won and lost, although it is important to note that the sovereignty of the kingdom has consistently remained intact (Kwakye 2007).

The majority of Akyem Abuakwa was previously covered in forests before the Akwamu takeover. At first, the Abuakwa people deforested some parts of the area to create space for the establishment of settlements and farms. The timber was used for construction purposes and as firewood. The forest of Akyem Abuakwa was also used for subsistence farming, hunting, and traditional gold mining (Addo-Fening 1997: 32). Though there is no concrete data on the details of how subsistence farming and hunting transformed the ecosystem of Akyem Abuakwa in pre-colonial times, current research

has shed light on how subsistence farming diminishes biodiversity by eliminating indigenous flora and substituting it with a limited selection of crops determined by the farmers (Medoaur 2021). Additionally, some traditional cultural practices like slash and burn agriculture and mono-cropping would have negatively impacted the forest. Also, given that current research on endangered species in the forest indicates that the endangered and near threatened animals' species are in single digits (Lindsell et al. 2019), it is reasonable to assume that pre-colonial hunting patterns prized certain animals over others. This was due to the low population density and the mysticism associated with Akan forests and animals in general which would have further limited the scope of hunting activities.

The Birem valley in Akyem Abuakwa is historically renowned for its abundant reserves of gold and vibrant gold mining operations date back to times immemorial (Ofosu-Mensah 2017). Regarding pre-colonial artisanal small-scale mining, it is important to mention that the environmental impact was minimal due to the low population density and the simple technology used by the native miners of Akyem Abuakwa. In contrast, modern mining in the twentieth century, which involved the use of heavy machinery such as bulldozers, caused significant environmental degradation. The traditional approach to mining merely skimmed the outer layer of the deposits. The sole significant drawback to the landscape was the numerous excavations in the forest, posing fatal hazards to unsuspecting travellers. Travelers passing through Akyem discovered that the terrain surrounding frequently used trails was extensively perforated with numerous small pits, measuring approximately two feet in diameter. These holes posed a significant risk to unsuspecting individuals who could easily stumble into them during nighttime (Ofosu-Mensah 2017).

According to oral tradition and documentary sources of the 17th and 18th centuries, the gold was used to make ornaments, royal regalia and also circulated as currency. Much of it was also traded on the coast in the castles for firearms, ammunition, textiles, knives and alcohol (Ofosu-Mensah 2011).

Commercial Farming and Deforestation

The introduction of large-scale commercial farming altered the Akyem Abuakwa landscape and unavoidably impacted the eco-system by replacing forest trees with commercial crops. Starting in the 1820s, Akyem Abuakwa

witnessed a significant increase in the number of political exiles seeking refuge from the retaliation of the Asante kingdom. The individuals in question were citizens of Kotoku and Dwaben who had been forced to leave their respective kingdoms. The Kotoku state was initially restored at Gyadam in 1824 and later moved to Western Akyem in 1863 following the Gyadam War (Addo-Fening 1980). In (Addo-Fening 1973), the royal house of the New Dwaben State temporarily moved to Abuakwa. The exiles utilised these grounds, which were exempt from rent, for the cultivation of oil palm plants and this negatively impacted the forests of Akyem Abuakwa (Colonial Secretary 1911).

Later, in the mid-nineteenth century, large tracts of Abuakwa lands were sold to Krobo and Akuapem farmers for the purpose of engaging in commercial farming. The Industrial Revolution led to a significant increase in the need for palm oil to lubricate machines in Europe. As a result, palm oil production in West Africa surged from 1,000 metric tonnes in 1810 to more than 40,000 metric tonnes in 1885 (Hopkins 2014 [1973]). Palm oil emerged as a significant and widely cultivated cash crop on the Gold Coast, mostly for export to the European market. The Krobo people of the south-eastern Gold Coast played a prominent role as producers and suppliers of this commodity (Amanor 1999: 51). The growing demand for palm oil and the profitability of the trade led to a large number of Krobo and Akuapem farmers coming to Abuakwaland to buy untouched forests for growing oil palm trees. The Chiefs of Akyem Abuakwa indulged in imprudent transactions of stool lands from the latter part of the 19th century to the early 20th century. The expansion of commercial farming expedited the rate of deforestation in the state.

The Krobo farmers initiated their land acquisitions from neighbouring communities in the 1820s. By the 1860s, they had expanded their purchased lands by around ten miles, stretching from the Akuapem scarp to the Ponpon River. During the period from the 1860s to the 1870s and up until 1890, they obtained around 120 square miles of Abuakwa land from the Begoro Stool. This expansion allowed them to extend their borders from Ponpon to Odumatta (Adm. 11/1/1122). The haphazard disposition of Begoro lands had allowed the Krobo people to gradually expand their territory from the River Bisa to River Akrum, a distance of eight miles, by the early decades of the twentieth century (Adm. 11/1453). Consequently, Krobo farmers who lacked sufficient land resources sought to expand their oil palm plantations and, subsequently, cocoa cultivation, and thus participated in the competition for Abuakwa lands. Akuapem oil palm farmers obtained

leasehold rights to Abuakwa lands next to Ahabante from the Kukurantumi stool for the purpose of cultivating palm. In 1865, they compensated Nana Ampaw with palm oil as a tribute for the use of his land. In 1865, Okyenhene Amoako Atta I, reclaimed the lands on the left side of the Densu River from Ahabante to Adweso and resold these properties to Akuapem farmers (Adm. 11/1/1122).

This spike in land sales was because the Abuakwa chiefs experienced a gradual decline in wealth following the abolition and emancipation of slaves and pawns as well as the establishment of legitimate trade. Consequently, they developed an interest in selling forest land to commercial farmers. These irresponsible and unauthorised land transactions had a significant impact on the Akyem Abuakwa terrain, resulting in a drastic transformation and a decrease in forest coverage, thus becoming an environmental concern.

The advent of cocoa cultivation exacerbated the environmental situation of Akyem Abuakwa. Cocoa production expanded to Akyem Abuakwa in the 1890s, originating from the Akuapem scarp. By 1900, the majority of Abuakwa lands to the west of the Densu River had been sold and acquired by Akuapem and Krobo farmers. Subsequently, the Shai, Fante, and Ga commercial farmers also joined in (Hill 1997 [1963]). Johannes Muller (1893), a Basel missionary stationed on the Gold Coast, provided a description of the rapid acquisition of Abuakwa estates in 1893 as follows:

> "People from Accra, Abokobi, Aburi and Mampong are all the while moving their farms towards Akyem soil. Many parcels of land have been sold to people from the coastal districts by the Akyems. They are moving into the vicinity of Kukurantumi and into the Begoro hills and in the south, they are a day's journey from Asman [i.e., Asamankese] or the Akim side of the Densu... there is now a hunger to possess land among the people."

Due to the abundance of land, the Divisional Chiefs of Akyem Abuakwa frequently assigned plots to migrant farmers from nearby states. The leaders of Apapam, Maase, and Asafo sold their stool lands to farmers without discrimination, allowing them to cultivate cocoa. For instance, Odikro Kwame Mane of Apapam sold a significant portion of his ancestral lands, which extended from Apapam to Nsawam and were located west of Suhum, at an extremely low price. Likewise, the chiefs of Asafo and Maase sold off a majority of their lands located just to the west of the Densu River. Akyem Abuakwa lands gained significant commercial value due to the strong demand for industrial raw materials (Addo-Fening 1997).

The cocoa industry had a significant impact on Akyem Abukwa. It accelerated the rate of deforestation in the state. By 1893, forests still covered the majority of Abuakwa territory—about 80%—in untouched or mature conditions (Buck 1879). However, by 1933, around one-third, or 33%, of the entire land area of Abuakwa had been deforested for the production of cocoa (Adm. 11/1779). During the 1890s and the early twentieth century, migrant farmers from the colony continued to acquire Abuakwa stool lands. Akuapem migrant farmers purchased large parcels of forested land from the Akanteng, Asamankese, and Apapam Stools. By 1933, they had converted 26 km of land along the Asamankese-Suhum road into cocoa fields. The land commercialisation during the period from 1900 to 1914 was characterised in an extreme manner, resulting in the majority of Abuakwa land being sold and acquired by migrant farmers. Furthermore, farmers from the Fante, Ga, Shai, Ewe, Akuapem, Krobo, Anum, and Awutu occupied land in the Asamankese region (Adm. 11/1779).

Indigenous Approaches to Forest Conservation in the Akyem Abuakwa Region

The preservation or conservation of environmental resources was a feature of Akyem Abuakwa customary law and religion throughout pre-colonial times.

Sacred Groves

An important means of environmental conservation was the sacred grove. In Ghana, sacred groves are designated areas or islands that have been preserved in their natural state. Local socio-religious and cultural systems played a significant role in the partial or complete protection of forests with diverse features (Interviewee 1, personal communication, 23 August 2021). The traditional religious authorities are responsible for their maintenance, occasionally without the need for official intervention (Ntiamoa-Baidu 2008). The significance of this phenomenon encompassed several dimensions, including ecological, socio-cultural, medical, religious, and ecotourism aspects (Bempong and Nsiah 2010). The Anweam sacred grove, located within the Esukawkaw Forest Reserve in Akyem Abuakwa, was one of the focal points of preservation initiatives. Anweam serves as the Asunafo royal family's ancestral home and final resting place. Despite the entire ethnic group's relocation during the establishment of the forest reserve in the 1930s, the chiefs and elders have managed to maintain deep connections to their sacred territory.

Individuals who own land adjacent to the reserve intentionally conceal the precise whereabouts of particular sites and continue to remunerate the local owners (Amoako-Atta 1998). This practice has been explained by Gerard Chouin who interprets it as one of the many ways royal families legitimised their position by linking their matrilineage with one of the earliest settlements in the kingdom (Chouin 2008). According to an informant, the propagation of the grove helped prevent the plundering of royal graves as the spirituality surrounding the grove discouraged grave-robbers from defiling the royal tombs, which were typically laden with gold and valuables (Interviewee 1, personal communication, 26 August 2021). Due to the myths and traditional beliefs surrounding the groves, the Akyem Abuakwa people harmoniously coexisted with the grove.

Totemism

Furthermore, totemism which is major part of the Akyem Abuakwa traditional belief system also promoted forest species to some extent. According to George Benson (2021), totems are items, such as animals, that are held in high regard by individuals or certain groups of people due to their sacred nature. In addition to animals, totems encompass plants or natural entities that are perceived to have ancestral connections to a clan or family, serving as tutelary spirits (Ntiamoa-Baidu 2008). Moreover, customary belief sees some natural entities as having ancestral connections to a particular ethnic group, clan, or family. In the context of totems, it was considered a holy and highly respected practice for individuals to refrain from causing harm to their totems. Due to this rationale, individuals refrained from consuming, exterminating, or restraining such creatures, avian species, or aquatic organisms (Interviewee 5, personal communication, 20 August 2021). Though it is unlikely that the main idea behind totemism was environmental protection, the belief that certain animals were spiritually related to sections of the population afforded them some protection. However, the level of eco-protection afforded by totemism was marginal as other members of the community who did not have ancestral ties to the totems were free to hunt them.

Within the Akyem Abuakwa traditional area, each clan possesses distinct totems that are representative of various animals inhabiting the surrounding forested regions. The beliefs pertaining to totems thus contribute to the preservation of certain areas where these animals are situated. According to Benson (2021), the Bretuo clan is associated with the leopard, the

Ekuona clan with the buffalo, and the Oyokuo clan with the falcon. The conservation efforts implemented in indigenous forest reserves, to some degree, safeguarded several species of flora and fauna, which also held significant value in traditional medicinal practices in Ghana.

Sasa

Among the Akan of Ghana, several plant species are believed to embody *sasa*, a potent spiritual force that commands reverence, fear, and ritual regulation. These beliefs significantly shape patterns of resource use and function as indigenous conservation mechanisms.

Foremost among such plants is Okuobaka aubrevillei (Odii), widely regarded as the "king" of plants in traditional Akan cosmology and a totem among the Akwapim. Odii is believed to possess extraordinary spiritual power: informants maintain that few animals can pass beneath it without spiritual consequence, and that spiritually weak animals may die instantly if they attempt to do so (Interviewee 6, personal communication, 23 August 2021). Hunters report the presence of animal bones beneath the tree, reinforcing its feared status. Only spiritually potent animals, such as the giant rat (Okusie) and the porcupine, are believed capable of passing under it unharmed. Such narratives underscore the hierarchical spiritual ordering attributed to both flora and fauna within Akan thought.

Similarly revered is Spiropetalum heterophyllum (Homakyem), distinguished by its blood-like sap and reputed ability to "speak" at night. Traditional priests and healers attribute significant medicinal value to this plant, but its harvesting is strictly regulated (Interviewee 7, personal communication, 20 August 2021). Only spiritually fortified individuals may cut it, and even then, only at dawn or dusk to avoid casting a shadow upon it—an act believed to constitute self-inflicted spiritual harm. Ritual appeasement, typically involving eggs and libation (often alcohol), precedes any cutting (McLeod 1981). These elaborate prescriptions reinforce both spiritual discipline and ecological restraint.

Chlorophora excelsa (Odum) is also regarded as possessing immense *sasa* and is sometimes considered divine among the Akan (Abbiw 1990). It is believed that Odum can assume human form at night and inform chiefs of wrongdoing within the community, thereby functioning symbolically as a moral guardian. This belief partly explains why Odum trees are often located at the outskirts of settlements. Ritual offerings

precede its felling; as noted by Sarfo-Mensah et al. (2010), an Ashanti craftsman traditionally offers an egg and petitions the tree for protection before cutting it.

Another spiritually potent species is Entandrophragma (Tweneboa), commonly found in Ghana's forest zones. Its wood is used to carve the sacred *fontonfrom* drum, central to Akan ritual performance (Rattray 1959; Warren 1986). The intense emotional and possessive states induced during drumming are attributed to the spirit residing within the tree itself. Consequently, only spiritually powerful carvers are deemed capable of working with Tweneboa, reinforcing controlled access to the species.

Finally, Ceiba pentandra (Onyina) is associated with unusual stillness and is widely regarded as an abode of spirit beings, including *mmoatia* (fairies) (Sarfo-Mensah et al. 2010). Among communities such as Berekum, Eguafo, and Abrem, libation and offerings—often eggs—precede its felling. The aura of sacred presence surrounding Onyina has likely contributed to its preservation.

Collectively, beliefs in *sasa* surrounding these species impose ritual restrictions, spiritual sanctions, and moral obligations that regulate human interaction with the natural environment. In doing so, they functioned not merely as cosmological expressions but as culturally embedded systems of biodiversity conservation.

Animism

Animism, which involves attributing a living soul to plants and other natural objects, has been utilised in diverse ways to safeguard the preservation and proliferation of several plant species and animal populations throughout the African continent. The utilisation of this notion has been observed in Akan indigenous culture, namely among the Akyem Abuakwa community, as a means to safeguard and sustain the natural environment (Ntiamoa-Baidu 2008). This notion examines the conservation of natural resources with the aim of ensuring the long-term sustenance of the human species. The animistic inclination has been seen and analysed by several researchers. According to James Frazer, contemporary and forthcoming generations have a significant debt to their predecessors due to their adeptness in environmental preservation, which was facilitated by the principles of animism and totemism (Frazer

1910). Based on the findings of the present study, it is contended that animism and totemism had the perhaps unintended effect of preserving certain environmental resources in support of traditional medicinal practices. The acquisition of potions and medications by traditional or indigenous healers sometimes involved sourcing them from various animals and plants. To substantiate the aforementioned claim, a senior individual argued that, throughout the colonial epoch, the field of medicine encompassed a holistic approach, wherein the acquisition of remedies was not just limited to plants.

> "Numerous compounds have been utilised by our predecessors, as well as in contemporary times, for the goal of therapeutic intervention. Mortor [a mixture of a plant and animal products] and onini srade [python fat/oil], for example, were derived from animal remnants. These animals were not intended to be hunted for the sake of human food. Our forefathers engaged in the act of safeguarding them with the intention of using them for future medicinal applications" (Interviewee 2, personal communication, 25 November 2021).

Taboos

Additionally, taboos have been and continue to be regarded as significant socio-cultural norms that are rigorously adhered to within the Akyem Abuakwa traditional area. Taboos are social constructs that define the boundaries within a group, determining the acceptability or unacceptability of various activities (Ntiamoa-Baidu 2008). Traditionally, these ideas are widely acknowledged and embraced throughout the academic community. According to Ntiamoa-Baidu (2008), the act of violating a taboo is commonly regarded as a tangible and metaphysical transgression, resulting in potential adverse consequences for the community, such as the occurrence of natural disasters, scarcity of resources, and loss of life, which are perceived as divine retribution. Therefore, in order to pacify the deities and purify the territory, it becomes necessary to perform rituals or make sacrifices.

Based on empirical studies, it has been noted that some animal species have a significant level of reverence among the residents of Akyem Abuakwa village. It is crucial to underscore that the hunting and killing of several species of monkeys and leopards, was considered taboo. In our endeavour

to comprehend and acknowledge this inclination, a senior member of the Abomosu community underscored that:

> "It is widely accepted that these creatures play a crucial part in the development of our community. The prevailing belief is that these objects serve as totems for certain clans. Historically, stakeholders designated their dwelling places as restricted areas in order to safeguard themselves from being pursued or harmed by individuals for the purpose of consumption" (Interviewee 3, personal communication, 26 August 2021)

The primary purpose of these taboos was promoting the sanctity and purity associated with divine entities while simultaneously mitigating the adverse effects of human activities on natural resources such as land, rivers, and forests. In several villages where the Birem river god is held in high regard, Tuesday is regarded as a sacred day, often known as "*dabone*," during which the aforementioned actions are strictly forbidden. The local communities impose sanctions for any violation. Offenders are required to appease the deities by engaging in sacrificial practices. The determination of sacrifices is often carried out by the priests in collaboration with the deity through consultation. Nevertheless, it has been verified by individuals residing in the area that the efficacy of these taboos is being eroded as a result of an increasing lack of faith in the customary rituals, mostly influenced by the presence of Christianity and Islam (Sarfo-Mensah et al. 2007).

Proverbs and Songs

Proverbs and songs also serve as significant traditional methods employed in Akyem Abuakwa for the preservation of environmental resources. Throughout the African continent, the utilisation of proverbs and songs has been prevalent as a means to convey and transmit significant insights on societal realities. Throughout history, proverbs have served as a prominent means through which African traditional cultures have conveyed many ideas, particularly those pertaining to the concept of God (Yankah 1989). Moral teachings are commonly conveyed through what are referred to as "wise sayings." The interpretation of proverbs is necessary in order to achieve more comprehensive and nuanced knowledge. In a similar vein, akin to proverbs, traditional songs within the Akyem community serve as vehicles for imparting moral teachings aimed at fostering the preservation of their forest and environment.

Folktales

In addition to proverbs and songs, myths and folktales serve as an additional strategy employed as a means of forest protection in the region of Akyem Abuakwa. Myths have a significant role in intergenerational communication throughout several African traditional communities (Apter 1987). Myths are a form of traditional narrative that hold religious significance and provide insights into people's beliefs on divinity and historical events (Frobenius and Fox 1999). The older members of the Akyem Abuakwa community recount these myths and legends with the intention of instilling a sense of purpose among individuals to safeguard the forest for its practical benefits.

Conservation in the Field of Medicine

The Akyem practice herbal therapy that has long been recognised as a significant provider of health remedies for African populations throughout history. Significantly, it is widely acknowledged by researchers that before European colonisation, indigenous medical practices, including the utilisation of herbal medicine, constituted the primary medical system in Africa (Feierman et al. 1992). The data provided by the aforementioned interviewee indicates that the primary factor motivating the community to enforce a prohibition on tree felling in the vicinity of riverbanks was the preservation of the surrounding green ecosystem. Additionally, one might deduce that the preservation of the region and its resources has functioned as a significant centre for traditional herbal treatment for several generations. According to the Food and Agriculture Organization of the United Nations (FAO), and United Nations Environment Programme (UNEP) (2020), existing information indicates that around 28,000 plant species, which are distributed across forest ecosystems worldwide, exhibit diverse therapeutic properties (see Table 1).

Local name	**Botanical name**	**Therapeutic properties**
Nseduansehoma	Berlinia confusa Hoyle	Menstrual cramps
Aprokuma	Antrocaryon micraster A. Chev.	Pressure, Chicken pox, Stomach ache
Kumanini	Lannea welwitschii (Hiern) Engl.	*Aseram*, Child fever, Piles
Ofram	Terminalia superba	Convulsion

Table 1. Medicinal tree species used in the treatment of diseases by the forest-fringe communities

Mode of Preparation

The study revealed a variety of methods used in the communities under study to prepare plant-based treatments for ailments. The most commonly used method of preparation was decoction. The process entails grinding, crushing, infusion, and direct consumption of the raw material. Nevertheless, factors such as the specific plant components used, the administration method, and the nature and location of the ailment it aims to treat influence the selection of the preparation method. According to Wodah and Asase (2012), traditional societies across Africa extensively use these preparation methods. Muluye and Ayicheh observed that combining different modes of preparation for medicinal plants can enhance the extraction of a higher percentage of the active components (Muluye and Ayicheh 2020). The interviewees explained that grinding was preferred for preparing herbal treatments while the plant parts were still fresh mainly because the plant materials required for healing are not easily accessible or obtainable in a dried state. Next, they subject the ground material to decoction, boiling it in water in a pot to extract phytochemicals from the plant material. This also aids in the long-term preservation of the plant material. Numerous studies have demonstrated the widespread preference for these preparation methods across various global regions, particularly in Africa.

The type of condition, the specific body area the ailment affects, and the species of medicinal plant used influenced the choice of remedy delivery routes. Oral delivery was the most commonly used method, followed by body massage, ingestion, bathing/steam bathing, nasal/ear/eye drop, and inhalation. Traditional medicine techniques commonly utilised both exterior and internal modes of administration for traditional cures (Wodah and Asase 2012). Nevertheless, certain skin and trauma-related problems necessitated oral administration of treatments. Asigbaase et al. (2023) also argue that many medicines were provided using solvents, such as water and meals, because they were believed to facilitate the transportation of remedies to specific organs in the body.

The authors found that the participants obtained information about medicinal plants from various sources. The majority of the herbal healers interviewed acquired their knowledge primarily through parental training with just a small minority obtaining their knowledge through apprenticeship. Other individuals acquired their information from common knowledge and recommendations from others.

Deforestation impacts the spread of plants, interactions between species, and the availability of resources by felling trees and breaking up the areas where they naturally grow. The escalating deforestation rates in Akyem Abuakwa have posed significant challenges for traditional healers in their search for therapeutic plants. According to the herbalists, spending hours searching for the right plant may not yield results (Interviewee 4, personal communication, 23 August 2021). The growing scarcity of medicinal plants has led to a significant increase in the costs of herbal medical care. Practitioners have observed a significant rise in traditional medical care prices ranging from 50% to 100% (Interviewee 2, personal communication, 25 November 2021). Some herbal medicinal practitioners claimed they have resorted to using more accessible but less potent herbs to cure ailments, resulting in a decrease in the treatment's efficacy (Interviewee 4, personal communication, 23 August 2021). In rural areas of Akyem Abuakwa where contemporary medical treatments are prohibitively expensive or inaccessible, the effects of deforestation on medicinal plants pose significant challenges in treating diseases.

Forest Conservation Practices in Akyem Abuakwa during the Colonial Era

Colonialism did not end Akyem Abuakwa's traditional forest conservation practices but rather they were subsumed under colonialist conservation efforts. During the colonial era, the British government implemented land conservation laws in Ghana's Gold Coast, primarily driven by the growing global demand for minerals and natural resources. These laws aimed to regulate and manage the region's forest resources, including gold, cocoa, and timber.

Background to Forest Legislation in Ghana

The colonial authority did not enact forest legislation until mining and wood businesses began their operations on a significant scale (Agbosu 1983). The Native Jurisdiction Ordinance of 1883 granted Traditional Councils the authority to establish bye-laws to safeguard water courses and preserve forests. Prior to the publication of the Report of the Commission on Agricultural Potential of the Gold Coast in 1894, the colonial authority did not enact any forest legislation. The report highlighted the potential prospects that the woods of the Gold Coast presented to the British business community. However, it cautioned against the perils of haphazard and

unregulated use of the forests, which were described as an "untouched reservoir of riches." The government's strategy during the first three decades of the nineteenth century would have been influenced by the perspectives outlined in this report. Therefore, the focus shifted to preserving enough land as forests in order to support agricultural demands, guarantee sufficient water resources, and sustain the production of lumber, fuel wood, and other forest products in quantities suitable for both export and local consumption.

Within a span of four years following the publication of Report of the Commission on Agricultural Potential of the Gold Coast, wood and mining companies significantly expanded their operations. The magnitude of their operations was evident in the quantity of lumber exported to Europe from 1900 to 1906. These actions posed significant hazards to the trees, which may potentially threaten sufficient water supplies and negatively impact the climate of the colony. The mining industry during this period saw significant growth, utilising timber sourced from surrounding woods in proximity to the mining hubs. Miners favored a species known as "Kaku" or "fillacopsis kaku" for fuel and props, leading to the indiscriminate cutting down of undersized trees (Rodger 1901). This engagement in these activities has resulted in significant hazards, potentially jeopardising the availability of sufficient water resources and adversely impacting the colony's climatic conditions.

Scientific evidence supports the notion that enough vegetation creates favourable weather conditions that positively affect health Amanor states that the Forest Ordinance implemented measures to prevent excessive exploitation and preserve the climate of the forest zone and watershed (Amanor 1999: 51). The colonial administration was concerned about uncontrolled deforestation and illegal mining activities in the Birem Forest Reserve. The Forestry Department, which was established in 1909 to this effect, had the authority to allocate concessions for these forest reserves, with 40% of the proceeds going to the owners and the Forestry Department keeping the remaining 60% for administrative purposes (Teye 2008). The Forest Ordinance of 1910 and the Forest Reserve Ordinance of 1937 were also enacted in the Gold Coast, specifically in Akyem Abuakwa. The Forest Ordinance aimed to restrict activities like mining and logging that caused degradation of the Birem forest. The goal of the Forest Ordinance was to establish a forest reserve for future use. This would immediately and later have beneficial effects on the lives of the residents of Akyem Abuakwa as these two regulations protected the forests which would result in favourable weather conditions and pristine water bodies. Additionally, the forest reserve would

later catalyse a vibrant eco-tourism industry promoted by an appreciable depth of academic research. The colonial authority also established the positions of Forest Commissioner and Reserve Commissioner to guarantee the efficient implementation of this policy (Forest Ordinance 1927). The beneficial influence of this approach on the environment has diminished over the current era due to the excessive use of natural resources in Akyem Abuakwa. During the reign of Nana Sir Ofori Atta I, specific measures were enacted to safeguard rivers against pollution and establish traditional bye laws to manage and maintain the environment in Akyem Abuakwa.

Adu-Gyamfi et al. (2020) have argued that the land conservation laws implemented by the British during the colonial era in Ghana, then known as the Gold Coast, served not only as a means of environmental management but also as a tool for the British to exploit the forest resources of the region. This assertion is corroborated by Sackeyfio (2012), who wrote that the implementation of various land conservation laws on the Gold Coast by the British during the nineteenth century was primarily driven by a growing global demand for minerals and other natural resources, including gold, cocoa, and timber. However, the authors of this article argue that these laws resulted in the preservation of the forests, which were later developed into eco-tourism sites in Akyem Abuakwa. One of such tourist sites is the Atiwa Forest Reserve.

Indirect Rule and the Foundations of Environmental Degradation in Akyem Abuakwa

Under indirect rule, the relationship between the colonial state and Akyem Abuakwa traditional authority was unstable and contingent, shaped less by concern for environmental protection than by the colonial imperative to control land, revenue, and political authority. From the outset, colonial interventions in governance undermined the institutional foundations through which environmental norms had historically been enforced. Beginning in the 1880s administrative reforms targeting chiefly judicial authority gradually hollowed out indigenous systems of land and resource regulation, creating conditions that later enabled widespread environmental degradation.

A critical turning point was the re-enactment of the Native Jurisdiction Ordinance of 1878 as the Native Jurisdiction Ordinance (NJO) of 1883. The ordinance fundamentally altered the basis of chiefly power by rendering

judicial authority derivative rather than inherent. Chiefs became liable to removal for abuse of power, while their authority to make by-laws and exercise civil and criminal jurisdiction was made contingent on gubernatorial approval. Although framed as measures to promote "peace, good order, and welfare," these reforms subordinated customary governance to colonial legal hierarchies and transformed chiefs into administrative auxiliaries of the state (Metcalfe 1964). Akyem Abuakwa's exclusion from the NJO (1883) further accelerated this erosion. The absence of a recognised political head during the exile of Okyenhene Amoako Atta I (Addo-Fening 1980), colonial mistrust of his loyalty (Adm. 11/1/1095), and the perception that NJO recognition was a privilege reserved for compliant rulers combined to place the state outside the formal framework of native administration (Chief Justice 1889). As a result, native courts in Akyem Abuakwa were increasingly delegitimised. From 1884, English courts treated unregistered native courts as mere arbitrators' tribunals, repeatedly warning chiefs that they exercised judicial power "at their peril" (Addo-Fening 1990: 108). District Commissioners refused to recognise or enforce their judgments, effectively stripping traditional authorities of coercive capacity (Adm. 11/1/1477).

This weakening of authority was compounded by contradictory colonial jurisprudence. While *Opon v. Ackinnie* (1887) affirmed that the Supreme Court Ordinance of 1876 had not abolished chiefly jurisdiction, this recognition was quickly overtaken by administrative centralisation. In October 1887, Akyem Abuakwa was constituted as the Eastern Akim District, and a permanent District Commissioner's court was established with authority to rehear cases already decided by the Okyenhene (Adm. 11/1/1094). Backed by armed constables, the colonial court offered subjects an alternative and often more intimidating forum for dispute resolution (Addo-Fening 1990: 99). As in the coastal towns, where judicial commissioners increasingly commanded popular obedience, this arrangement proved deeply subversive of traditional authority (W. B. Griffith 1887, *Public Records and Archives Administration Department,* Adm. 11/1/1477).

The consequences for environmental governance were profound. Chiefly judicial power had long underpinned the enforcement of religious norms, land-use restrictions, and communal obligations regulating forests, rivers, and farmlands. Sacred groves, hunting taboos, and controls on land alienation depended not on formal legislation but on the social authority of chiefs and their courts. As colonial interventions fractured this authority, these informal but effective systems of environmental regulation weakened.

By the end of the nineteenth century, central authority in Akyem Abuakwa was close to collapse. Sub-chiefs and subjects openly defied the Okyenhene, disrupted court proceedings, and assaulted his messengers, while the colonial state's indulgent posture toward litigants encouraged habits of independence and indiscipline (Addo-Fening 1990).

These political changes coincided with expanding commercial opportunities under an economy of "legitimate trade," further loosening traditional control over land and resources. The erosion of authority was reflected in the actions of timber loggers and "Kroo boys," who increasingly ignored customary restraints on forest use (Agbosu 1983). By the time the Akyem Abuakwa State Native Authority by-laws were introduced under Nana Ofori Atta I after 1912, chiefly power had already been significantly compromised. Although these by-laws, enacted under the Native Jurisdiction Ordinance, were presented as instruments to protect property for future generations, generate revenue, and impose administrative order, they operated within a colonial framework that denied chiefs effective coercive power.

The case of the Atiwa Range Forest Reserve illustrates the long-term consequences of this trajectory. Designated in 1926 under Native Authority by-laws, Atiwa initially remained under traditional control. Yet illegal logging proliferated as timber concessionaires, operating through independent contractors, flouted both customary and statutory regulations. The Concessions Ordinance governed the acquisition of timber rights but provided no effective oversight of operations, and concession agreements were routinely withheld from the Commissioner of Stamps and the Concessions Courts (Agbosu 2000). Chiefs, though formally responsible for forest protection, lacked the institutional means to enforce compliance.

In 1935, the colonial government intervened by vesting the Atiwa Range Forest Reserve in the administration, holding it in trust for the Akyem Abuakwa Traditional Authority. This transfer marked the culmination of a process set in motion decades earlier. Traditional authorities were blamed for mismanagement, yet the judicial and political powers that had once enabled them to regulate land and forests had been systematically dismantled. Environmental degradation in Atiwa thus cannot be understood simply as administrative failure; it was the outcome of a prolonged erosion of indigenous authority under indirect rule, which destabilised local systems of environmental governance long before colonial conservation measures were imposed.

Thus, the Atiwa Forest occupies a distinctive place at the intersection of chieftaincy, ecology, and colonial governance. Long embedded within the authority of the Akyem Abuakwa chieftaincy, the forest was initially designated a reserve by colonial authorities because of its strategic importance as a watershed, encompassing the headwaters of the Birem, Densu, and Ayensu rivers and their tributaries, which supply water to surrounding communities and the city of Accra. Several streams of particular local significance, including Awusu, Kokoben, Obiri ne Obeng, and Abudwusu, also originate within the forest. Beyond its hydrological role, Atiwa has since been recognised as a site of exceptional biodiversity, providing habitat for more than 227 bird species and over 100 species facing global extinction (BirdLife International 2021). The subsequent vulnerability of this ecologically and culturally significant landscape highlights how changes in political authority under indirect rule reshaped the conditions under which environmental protection was practiced and enforced.

The Impact of Christianity on Indigenous Conservation Methods in Akyem Abuakwa

The introduction of Christianity into Akyem Abuakwa in the mid-nineteenth century profoundly disrupted indigenous environmental governance. Conservation had long been embedded in taboos, ritual prohibitions, and sacred laws regulating forests, water bodies, wildlife, livestock, and agricultural cycles. With the establishment of the Basel Mission station at Gyadam near Osino in 1853 and the subsequent spread to Kukurantumi and Kyebi by 1861, missionary activity backed by colonial authority systematically challenged these institutions (Addo-Fening 1990: 83). By promoting a Christian ethic that denounced traditional practices as "pagan" and inimical to progress, the mission weakened the legitimacy and enforceability of customary conservation mechanisms (Buck 1879).

Missionary hostility toward taboos culminated in Rev. Karl Buck's 1879 appeal to the colonial administration to legislate against certain customary prohibitions (Addo-Fening 1997: 67). This marked a turning point: regulations once collectively binding were redefined as matters of individual choice. The contested taboos, including bans on transporting firewood and palm nuts into towns, using brass pans in streams, keeping goats in residential areas, and farming on sacred days, had functioned to limit deforestation, protect water sources, manage livestock impact, and provide ecological fallow periods (Addo-Fening 1997: 75). Yet in 1882 the Civil Commandant

of the Volta District instructed Chief Buabeng of Anyinam that such rules could not be enforced, effectively stripping chiefs of regulatory authority while permitting voluntary observance (Adm. 1/9/2).

For traditional leaders such as King Amoako Atta I, taboos were integral to political sovereignty and environmental stewardship. The Basel Mission, however, framed them as violations of the "Christian conscience," positioning Christianity as a rival authority (Addo-Fening 1997: 80). Resistance to their erosion was widespread. In Asiakwa, converts were attacked for fishing in a prohibited stream; in 1877 Okomfo Kasewaa of Begoro attributed a deadly typhus outbreak to Christian violations of taboos against importing pigs and felling Odum trees; and Asafoatse Abam mobilised the asafo to prevent further destruction of sacred trees (Mohr 1878). Such episodes reveal a persistent belief that ecological imbalance and social calamity followed the breach of sacred conservation laws.

From the 1870s, the mission deepened these divisions by establishing segregated Christian settlements, Salem or *Oburonikrom*, intended to shield converts from "pagan" influence. Though initially viewed by the Okyenhene as a "state within a state," these enclaves gained support among converts seeking exemption from customary restrictions (Addo-Fening 1997: 178). Christians at Osiem in 1890 explicitly linked relocation to freedom from prohibitions on goat-keeping and farming on sacred days (Mohr 1890). Salem thus offered not only spiritual refuge but release from communal environmental controls, institutionalising selective adherence to conservation norms and fracturing the Akan conception of community as a unified moral-ecological order.

The long-term effects were evident well into the twentieth century. In 1940s, Christians in Osino openly contravened taboos, transporting firewood and palm nuts into mission stations and preparing fufu during the Ohum festival, acts forbidden in the main town (Addo-Fening 1997: 201). Efforts by King Amoako Atta in the 1880s to reassert traditional authority, including enforcing sacred rest days, met sustained Christian resistance and, at times, violent confrontation in towns such as Asiakwa, Asuom, Asunafo, and Kyebi (Addo-Fening 1997: 187). Over time, missionary education and ideology fostered growing alienation from indigenous culture, further eroding the social foundations of conservation.

By the close of the nineteenth century, the combined influence of the Basel Mission, colonial intervention, Western education, and measures such as the 1887 Public Announcement had substantially weakened Akyem Abuakwa's traditional conservation regime (Addo-Fening 1997: 189).

Through desacralising taboos, curtailing chiefly authority, and creating enclaves exempt from communal oversight, Christianity disrupted an integrated system of environmental management that had historically sustained ecological balance.

Post-Colonial Destruction of Eco-Resources in Akyem Abuakwa

The Akyem Abuakwa traditional area in Ghana has seen substantial challenges to its cultural and natural assets in the aftermath of colonial rule. This deterioration can be linked to several sources, such as illegal artisanal small-scale mining, commercial operations including farming and forest logging, bush fires, the disintegration of traditional institutions, and inadequate state aid (Attuaquayefio and Fobil 2009). Indigenous mining in Ghana, starting from the pre-colonial era and continuing until the 1980s, was predominantly uncontrolled and with minimal oversight from state entities. However, the Small-Scale Gold Mining Law (PNDCL 218) was enacted in 1989, granting Ghanaians the opportunity to get a licence for gold mining on a tract of land no larger than 25 acres. This licence permits mining activities without the use of explosives for the duration of three to five years (Hilson 2001).

As identified by Hilson and Potter (2003), the severe lack of employment opportunities and widespread poverty across the country in the 1980s have led to a remarkable expansion in both participation and output in Ghana's artisanal and small-scale gold-mining industries. Though economic conditions have vastly improved since then, poverty is still a major driver of informality. Approximately 31% of the country's population is below the poverty threshold, as reported by the World Bank (World Bank 2022). Also, economic development and legitimate employment opportunities remain low in rural areas which are still largely agrarian. Individuals without the resources to go into commercial agriculture and those unable or unwilling to take the risk of rural-urban migration have few avenues to make a living and mostly turn to artisanal and small-scale mining (ASM), a labour-intensive, low-tech method of mining and mineral processing. Regulatory failings and lack of institutional support have compounded the environmental dangers posed by small-scale mining and resulted in rampant environmental degradation (Hilson and Potter 2003).

Akyem Abuakwa has emerged as a refuge for itinerant individuals and seasonal agricultural workers, attracting a significant influx of migrants

from Wa and Bolgatanga, Accra, Kumasi, Prestea, and Tarkwa. The practice of artisanal small-scale mining in Akyem Abuakwa has highlighted two significant concerns: the impact on public health and the destruction of the environment. Communities have been experiencing enduring health consequences for centuries due to the presence of hazardous substances, such as mercury. The dumping of these chemicals into local waterways, such as the Birem River, has resulted in the contamination of streams and rivers, hence causing a rise in waterborne illnesses.

During the pre-colonial period, the Abuakwa people held the River Birem in high esteem since it provided them with essential resources and nourishment. The presence of gold in the Birem River further intensified their veneration, seeing it as a deity. Historically, traditional leaders, priests, and priestesses have diligently followed established customs about water use (Goba 2015). However, the decline of traditional authority and religion in Akyem Abuakwa during the colonial period laid the foundations for much of the degradation under discussion.

Still, just as in the colonial era, there have been efforts to re-assert traditional modes of conservation. The current King of Akyem, Abuakwa, is known both nationally and internationally for his conservation endeavours. He has integrated indigenous conservation practices with contemporary methods to ensure the safeguarding of the trees and wildlife in the traditional region. One of his numerous endeavours is the establishment of the Okyeman Brigade. The guards enforce adherence to conventional rules and regulations that safeguard the environment. They interact with government ministries, departments, and agencies (MDAs), as well as non-governmental organisations (NGOs), to safeguard the environment. The environmental subcommittees of local governments (district assemblies) depend on them for information regarding the activities of illegal loggers. The Forestry Services Division of the Ghana Forestry Commission partners with Brigade soldiers to patrol many forest reserves. Numerous environmental NGOs operating in the traditional region engage the brigades to implement community initiatives, specifically in water conservation and forest and wildfire prevention and management. Despite these efforts, the Forestry Service in the traditional area is still limited in reach and have expressed the lack of participatory off-reserve forest activities to sacred sites in more remote communities, which are vulnerable to the clandestine activities of illegal chainsaw operators. Such collaborative efforts could also provide the needed support of and training for local people in fire prevention and control to reduce the risk of fire outbreak.

Another area of environmental degradation concerns the landscape and has caused reduced biodiversity. Akyem Abuakwa is now facing significant environmental challenges caused by the small-scale gold mining sector. The Atiwa forest, which serves as a protective habitat for the River Birem's source, has seen extensive deterioration as a result of the use of illicit surface-mining techniques in the area. Illegal miners in Akroful, Adadientam, Asiakwa, and Sedwumase have devastated cocoa and other fields in order to conduct their mining activities, resulting in a loss of biodiversity and a decline in the presence of medicinal plants. The actions of illegal small-scale miners result in the destruction of medicinal plants that are locally used for the treatment of various maladies such as anaemia, asthma, gonorrhoea, measles, and typhoid. Opanin Denyira Ofori, a herbalist residing in Apapam, cautions that unless illegal small-scale mining activities are well controlled, it would pose significant challenges for herbalists to provide remedies for many illnesses in the coming times (Interviewee 4, personal communication, 23 August 2021). This highlights the possibility of mining operations to decrease natural resources, which can address health concerns in Apapam and nearby places.

The government’s endeavours to enhance the efficacy of small-scale gold-mining enterprises in Akyem Abuakwa have not primarily focused on environmental concerns. The government has implemented three primary strategies, namely formalisation, military intervention, and alternative livelihood schemes. Banchirigah (2006) asserts that the government's insufficient comprehension of the intricacies of illicit mining groups has impeded their endeavours. Nevertheless, these endeavours have failed to provide substantial gains leading to many protests and confrontations between security forces and local residents (Okoampa-Ahoofe 2014). These protests have centred on the activities of legal and illegal small-scale miners who claim government and the chiefs have failed to protect their water bodies and farmlands from the degradation of mining companies. There have also been claims of government-backed illegal mining operations. The government has described these confrontations as the result of locals’ attempt to stop the operations legally registered mining companies and the actions of angry illegal miners who have been affected by police crackdowns (GhanaWeb 2014). The involvement of certain traditional leaders, such as chiefs, heads of families, and other members of traditional authorities in causing harm to the environment is apparent in different traditional societies. These leaders have amassed significant sums of money from illegal concessions resulting in the depletion of forests, the

devastation of agricultural fields, and wetlands. The collection of money has enabled illicit miners to undermine the nation's established legal system. Local illegal operators and certain small-scale miners opt to sell their unprocessed gold or gold powder to intermediaries rather than making the arduous journey to towns to sell their gold. The intermediaries gather a sufficient amount of gold and transform it into purified chips, which are then either sold to the Precious Minerals Marketing Company or smuggled out of the country via both legal and illegal means (Hilson 2002). However, artisanal small-scale mining remains a high hazardous venture with an estimated average annual fatality rate of 44, which far exceeds the annual fatality rate of 5 of the large-scale mining sector of Ghana.

The illegal small-scale mining operations carried out in the Akyem Abuakwa region have significantly harmed the reputation of the established traditional authority. The authors' recent field investigation in Kyebi found that traditional authorities lack resolve in enforcing laws inside their territory. This is mostly due to the substantial financial benefits they receive from illegal artisanal small-scale mining operations.

Figure 2. Illegal miners at work at Akyem Apapam
Source: Ofosu-Mensah (2017)

The sustainability and safety of small-scale mining rely on the implementation of efficient organisational and regulatory structures within the business. Facilitating land release and implementing operator regularisation can encourage the adoption of organised and environmentally

sound practices. Research done in Noyem found that a significant number of people, including women, children, and elderly adults, participate in illegal galamsey activities (see Figure 2). However, they are open to actively seeking alternative work.

Yet another challenge to forest conservation is forest logging in Ghana in general and Akyem Abuakwa in particular. Illegal logging in Ghana involves various activities that involve corrupt methods to obtain access to forests, unauthorised extraction from protected areas, the felling of protected species, and the extraction of timber exceeding agreed-upon limitations (Tacconi et al. 2003). In Akyem Abuakwa, Ghana, chainsaw operators and registered logging enterprises are the primary culprits engaged in illicit wood extraction.

Upon Ghana's Independence in 1957, 96% of all timber concessions were held by expatriate companies. However, the number of Ghanaians involved in the timber industry increased over time, with interest-free loans being a mechanism for increasing the number of Ghanaian contractors. In 1972, the Timber Operations (Government Participation) Decree was passed, leading to an unprecedented level of state involvement in the timber sector. The Timber Industry and Ghana Timber Marketing Board (Amendment) Decree, 1977 conferred the sole monopoly of export of Ghana timber on the Timber Marketing Board (Oduro et al. 2011).

The period between 1972 and 1982 was marked by over-regulation, productivity disincentives, infrastructure collapse, institutional demoralisation, public sector mismanagement, and lack of rural infrastructure. This led to a decline in production and exports, with the value of timber exports falling from US$183 million to US$15 million. By 1982, the industry's share of overall export earnings dropped from about 18% to under 2% (Agyeman and Oduro 2007). In the Economic Recovery Programme (ERP) era (1983-88), soft loans were made available to some timber companies to enable them purchase new equipment and materials (Agyeman and Oduro 2007). The wood industry remained mainly export-oriented, with the local market virtually neglected. Since the construction boom during the ERP era, demand for lumber has been on the increase both domestically and for exports. The chainsaw permit system has been grossly abused by communities, District Assemblies, and some Forestry officials, making it spiral out of control (Oduro et al. 2011). Chain-sawing was consequently outlawed in 1997, and the Timber Resources Management Act, 1997 (Act 547) and the related LI 1649 were enacted to ban chain-sawing.

The Timber Resources Management Act (Act 547) of 1997 and the Timber Resources Management Regulations (LI 1649) of 1998 introduced a legal reform of the concession system, replacing timber concessions with Timber Utilisation Contracts (TUC) in forest reserve and off-reserve areas. TUCs provide greater enforcement of regulations, including compliance with forest management specifications and periodic audits. Act 547 formalised the rights of other stakeholders and required applications for timber rights to address social needs of communities (Birikorang 2001).

In 2002, Act 617 and LI 1649 were amended to exclude granting timber rights on land with private forest plantations or timber grown or owned by individuals or groups of individuals. Competitive bidding for timber rights was introduced, and the reforestation obligation was dropped. Forest reserves, created under the Forest Ordinance 1927, protected under the Forest Protection Decree 1974, and regulated under the TRM Act of 1997, 1998, and 2006, form the core legal framework supporting the 1994 Forest and Wildlife Policy.

The European Union initiated a Forest Law Enforcement, Governance, and Trade (FLEGT) in the early 2000s to combat illegal logging and trade. In Ghana, illegal chainsaw timber accounts for at least 80% of the domestic market. The chainsaw operation ban by LI 1649 in 1998 failed and to this day, it is clear that the law's enforcement has been ineffective and advocacy for alternative strategies has begun (Oduro et al. 2011).

Illegal chainsaw timber does not earn any formal timber revenue, and strict regulations on the production and transportation of chainsaw timber, along with a ban on private log exports, effectively keep local timber prices significantly lower than global market prices (Odoom 2005). Illegal logging has had significant adverse environmental, economic, and social consequences, such as the deterioration of forests, decrease in government revenue, erosion of democratic processes, exacerbation of poverty, and decreased local and international pricing of forest products (Arnoldo 2002).

Illicit logging and mining provide significant risks to biodiversity protection in the region. Okyeman has a protracted history of economic reliance on forestry, with numerous timber concessionaires operating in the region. The economic trees in the region comprise species such as odum (Milicia excelsa), wawa (Triplochiton scleroxylon), African walnut, and African redwood. Logging is not confined to woods beyond designated territory; for instance, in Atewa, the most recent official logging was in 1991; however, illegal logging persists, and the repercussions of logging are apparent. The

population of chainsaw operators has been rising since the mid-1980s and is currently prevalent. Chainsaw operators transport the extracted timber from the forest to easily accessible roadside locations for loading onto trucks. A recent study suggests that there could be up to 500 chainsaw operators in the Atewa reserve, including approximately 2,500 young men employed as operators and timber transporters. Moreover, illegal logging has encroached upon areas deemed sacred and previously venerated by local communities. Illegal logging, chainsawing, and commercial fuelwood harvesting have become prevalent in "Okyemanpo," the burial ground of the Kings of Okyeman, which was formerly a prime example of traditional forest conservation efforts in Ghana (Ghana Wildlife Society, GWS 2005).

Conclusion

This article has examined the historical trajectory of forest conservation in the Akyem Abuakwa Kingdom, tracing its evolution from pre-colonial practices rooted in indigenous knowledge systems to the complex environmental challenges faced in the contemporary period. By situating environmental history within the broader framework of social, political, and economic transformations in Ghana's Eastern Region, the study demonstrates how traditional environmental ethics and local governance institutions once played a central role in regulating forest use, maintaining ecological balance, and sustaining culturally significant species and sacred groves. Pre-colonial conservation practices were closely intertwined with spiritual beliefs, customary laws, and the authority of chiefs and elders, which collectively created an effective system of natural resource stewardship.

The findings reveal that these systems have been gradually eroded under the combined pressures of colonial and postcolonial interventions, commercial agriculture expansion—particularly cocoa farming—illegal mining operations, and widespread deforestation. Colonial policies disrupted traditional governance and land-use arrangements, weakening the authority of indigenous institutions, while modern economic incentives and population pressures further strained forest ecosystems. As a result, the sustainability of natural resources has been compromised, sacred and ecologically important areas have been degraded, and the cultural practices that reinforced environmental protection have declined.

This study underscores the critical importance of recognising and

revitalising indigenous conservation frameworks as part of contemporary environmental policy and management strategies. Integrating traditional ecological knowledge with modern approaches not only has the potential to enhance biodiversity protection and sustainable resource use but also to reinforce local governance, cultural identity, and community participation in conservation. By highlighting the historical interactions between culture, governance, and ecology, this research addresses a notable gap in African environmental historiography, demonstrating that sustainable forest management cannot be fully understood or achieved without appreciating the historical and sociocultural context in which these ecosystems exist.

Ultimately, this work advocates for a multi-dimensional approach to environmental stewardship in Ghana, one that bridges historical understanding, indigenous practices, and contemporary policy interventions. It calls for scholars, policymakers, and local communities to engage collaboratively in protecting the forests of Akyem Abuakwa, ensuring that both ecological integrity and cultural heritage are preserved for future generations. By situating forest conservation within the intertwined histories of power, economy, and culture, the study contributes to a more nuanced understanding of environmental challenges in Ghana and offers lessons for broader conservation efforts across West Africa and the continent.

Disclosure Statement

No potential conflict of interest is reported by the authors.

Statement of Ethics

This study adhered to established ethical standards for qualitative and historical research involving human participants and archival materials. The research was conducted with due respect for the cultural, social, and institutional contexts of the Akyem Abuakwa Kingdom, recognising that indigenous forest conservation practices are deeply embedded in customary law, spiritual beliefs, and traditional authority structures. Throughout the research process, cultural sensitivity was paramount, particularly in documenting indigenous knowledge relating to sacred groves, ritual practices, and spiritual beliefs associated with forest conservation. Culturally restricted information was neither solicited nor disclosed without appropriate authorisation. The study ensured that indigenous knowledge systems were

represented accurately, respectfully, and within their proper historical and cultural contexts. Prior to data collection, informed consent was obtained from all interviewees. Participants were informed of the purpose of the study, the voluntary nature of their participation, their right to decline to answer questions or withdraw at any stage, and the intended academic use of the data. Community entry protocols were strictly observed, and permission was sought from relevant traditional authorities before interviews were conducted in the selected communities. To protect participants' identities, all interviewees were fully anonymised. In the presentation of findings, they are identified only as Interviewee 1 to Interviewee 7. No personally identifying information is disclosed, and any contextual details that could indirectly reveal identities have been carefully managed. The study also complied with ethical standards in archival research. Primary documents obtained from the Public Records and Archives Administration Department were handled in accordance with institutional regulations. Archival materials were critically assessed for authenticity, context, and potential bias. Oral testimonies were cross-checked with documentary and secondary sources to ensure triangulation and minimise misrepresentation. By integrating informed consent, strict anonymisation, cultural protocol adherence, and methodological triangulation, the research upheld principles of respect, confidentiality, academic integrity, and cultural sensitivity.

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