



Preserving Ghana's Water Resources: Insights from Communities Along Keta Lagoon Complex Ramsar Site

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ABSTRACT

Maintaining water resources in Ghana is crucial to the survival of its populace. It is commonly said, it is the "survival of the fittest", but it is water that makes it possible for the fittest to survive. This study examined Ghanaians' activities towards water resources by exploring the views of residents of Anyanui, Anloga and Tegbi along Keta Lagoon Complex Ramsar Site. The study adopted the qualitative approach, narrative design and thematic analysis. In-depth face-to-face interviews with 15 residents, purposively and conveniently sampled from the three communities and observations in the Anloga District revealed that, there is a moderate environmental challenge to Keta Lagoon Complex Ramsar site. Over exploitation of mangroves, the habit of open defecation, dumping of refuse in the enclave and poaching were revealed in the study. The study concludes that, advancing the protection and strategizing to achieve effective management of wetlands in Ghana is needed to ensure that ecosystem benefits inure to mankind. Based on this, the study recommends that, Traditional chiefs should be given the mandate and be tasked to ensure rules and regulations regarding Ramsar sites are well respected. Moreover, Wildlife Division/Forestry Commission needs to be more vibrant in ensuring that, wetlands are wisely used and protected. The study also recommends that, toilet facilities need to be provided along the banks of the Keta Lagoon Complex Ramsar Site.

INTRODUCTION

Water is undeniably the most searched after resource in the daily life of all living beings. Apart from its ability to satisfy the thirsty needs of human and animal life, it has the ability to provide ecosystem services as well as monetary value for public good. It is not surprising how many rivalries are developed over rightful possession of water bodies. Ramsar sites are one of wetlands that have international recognition due to their ability to house well-functioning ecosystem components. The Ramsar Convention (the Convention on Wetlands), signed in 1971 which came into enforcement in 1975, was one of the first internationally recognized environmental convention that seeks to the protection of wetlands for the benefit of mankind.

The Ramsar Convention Secretariat defines wetlands as “areas where water is the primary factor controlling the environment and the associated plant and animal life. They occur where the water table is at or near the surface of the land, or where the land is covered by water” (Ramsar Convention Secretariat, 2016, p. 9). Wetlands are stores of biological diversity where birds, mammals, amphibians, reptiles, fish and others constitute the productive environment. This explains why there have been several attempts to conserve wetlands the world over. There had been innovative strategic plans which span from 1997 to 2015 on wetlands conservation.

Currently, the convention is working on the Fourth Ramsar Strategic Plan (2016-2024) to aid the effort of stakeholders in the area of wetland management to ensure protection, wise use and benefit derived by all (Ramsar Convention Secretariat, 2016). Thus, the Ramsar Strategic Plan 2016–2024 has three goals in focus: to address the driving forces of wetland loss and degradation; to effectively conserve and manage the Ramsar Sites; and wisely use all wetlands (Ramsar Convention Secretariat, 2016).

However, these ecosystems are under environmental pressure as a result of excessive resource exploitation (Junk et al., 2013; Ramsar Convention Secretariat, 2014). Wetland resources not limited to mangroves, fishes and thatch materials are collected indiscriminately with no exploitation restriction (Osei et al., 2011). According to Fianko and Dodd (2019), resources on a large scale are destroyed due to natural and anthropogenic activities. These activities include agricultural habitat alteration, the spread of epiphytic weeds, turtle egg predation and collection, illegal hunting of species that should be preserved, infrastructure development, and pollution (Fianko & Dodd, 2019). Uncontrolled refuse dumping on the surrounding ecosystem, from the emission of detrimental greenhouse gases to the contamination of ground water, is prevalent and has a negative influence on wetlands in most developing nations (Yankson, 1998; Lambin et al, 2003; Gibbs, 2000).

Ecological character, defined as the interaction of ecosystem components, processes, and benefits (Davidson et al., 2019), is decreasing in Ramsar Sites (Davidson et al., 2020). According to Davis and Brock (2008), these may be tracked by assessing critical ecological indicators, such as risks that induce deterioration. It was recently revealed that the vegetation cover of the Keta Lagoon Complex Ramsar Site is declining rapidly, posing vulnerability to the

overall ecosystem in the enclave (GBCOnline, July 27, 2021). This is because the mangroves that defined the wetland, particularly the banks of the lagoon, are regularly exploited for fuel wood. This scenario warrants guarded behaviour to ensure sustainability of ecosystem resources in Ghana.

As the population expands, so does the need to satisfy one's demands, driving individuals to engage in activities that endanger the environment. However, these same people are held accountable for the environmental damage they produce. Natural resources are deteriorating in scenic beauty, being contaminated, and being used indiscriminately as a result of several influences, particularly human activities. Meanwhile, by regulation, no one shall engage in practices that disturb the interaction processes of the ecosystem (Forestry Commission of Ghana, 1999).

Water scarcity, biodiversity loss, and ecosystem collapse are among the biggest worldwide threats to people (World Economic Forum, 2019). Wetlands have reduced by 35% globally between 1970 and 2015, with available data (Darrah et al., 2019). According to Kingsford et al. (2021) the Convention on Biological Diversity Aichi targets and Sustainable Development Goals (6 and 15) initiatives, for example, have shown the level of loss of wetlands in addition to their ecological services.

The preceding debate shows that monitoring human activities is critical to ensuring that water resources are protected in accordance with international treaties. There is a substantial body of research that investigates environmental attitudes (e.g., Okumah, Yeboah, and Amponsah, 2020; Okumah, Yeboah, Nkiaka, & Azerigyik, 2019b), but fewer studies (Fianko & Dodd, 2019; Osei et al., 2011) have examined human activities peculiar to wetlands. The objective of this study is therefore to examine Ghanaians' activities towards water resources with particular emphasis on Keta Lagoon Complex Ramsar Site.

The findings of this study will lead to national and international action in the conservation of wetlands. It will also inform wetlands management institutions such as the Wildlife Division/Forestry Commission about the need to implement precautionary measures to guarantee the sustainable use of Ghana's water resources. Finally, this research will help to raise awareness among Ghanaians about the ecological importance of Ramsar sites in our communities.

LITERATURE REVIEW

Improper agricultural activities

Rural areas in Ghana are characterized by agricultural activities with the presence of water bodies. However, unregulated animal grazing, the use of DDT and other dangerous fertilizers renders these water bodies polluted (Owusu et al., 2016). A study conducted in the Densu River basin for instance, contends that, poor microbial activity observed could possibly be attributed to human and live-stock pollution (Karikari & Ansa-Asare, 2006). This is possible regarding how residents along water bodies without appropriate waste disposal system dumps their waste uncontrollably. This implies that, improper

agricultural activities could result to the inability of the state to meet the consumption demands of its populace.

Illegal mining (galamsey)

When the natural state of water resources (e.g lagoon) significantly decreases in quality, it is regarded as polluted water since the substances making the natural composition rise above the normal expected concentration level due to anthropogenic activities (Uzun, Keles & Bal cited in Kilic, 2020). Pollution of water resources like lagoons, rivers and groundwater is usually initiated by human activities leading to loss in the intrinsic value of ecosystem. Some pollutants that can be found in water include, organic wastes that are toxic, fertilizers, waste from households, acids and metals (Goksu & Ziya cited in Kilic, 2020).

In the Ghanaian environment, most water bodies that provides basic source of good drinking water for households and related uses, have been significantly impacted by the activities of illegal mining. Thus, the small-scale mining is the second pollution arena after agricultural pollution (Kessey & Arko, 2013). Chemicals such as gold dust, oils from drilling machines and mercury from mercury-gold mixing process, have all been thrown into these rivers (Owusu et al., 2016) which has health consequences for Ghanaians.

It is imperative to note that polluted water does not remain in itself but is passed to the soil, which also passes to plants and vegetables and affecting overall food production levels (Owusu et al., 2016). The implication is that, polluted water has ripple effect as it has the ability to infest both humans and animals and affect agricultural production.

Waste and chemical pollution

According to Owusu et al. (2016) in Ghana organic and chemical waste both from households and industries respectively ends up in water bodies and which is on an alarming rate. The Korle Lagoon is cited to be one of the most polluted water bodies in Ghana which it has major channels in Accra connected to it to disposal waste into the sea (Asumadu-Sarkodie et al., 2015). A look at the industrial areas shows that such quantities of industrial wastes are discharged into open drains destroying the beauty of lagoons. Owusu et al. (2002) intimate that, even though there are ongoing efforts, managing and preserving water bodies, it is a daunting task. According to Owusu et al. (2002), a well-recognized effect of such activities is that a slight rainfall leads to floods in Accra.

METHODOLOGY

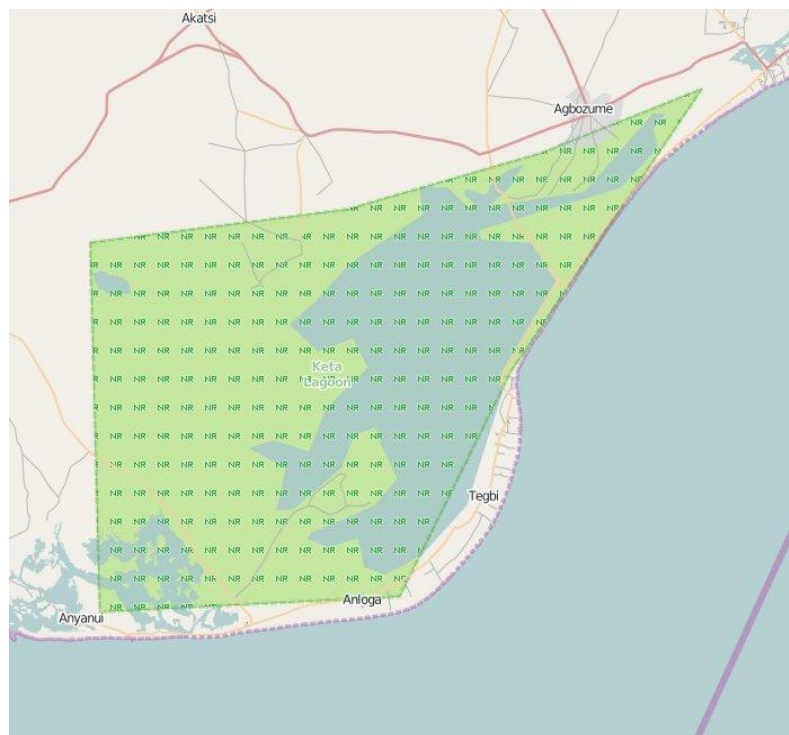
This study is based on a data gathered during field work within Anloga District; Anyanui, Anloga and Tegbi in particular, that is, part of the many communities that houses Keta Lagoon Complex Ramsar site. Anloga District is predominantly farming and fishing community. It was purposely sampled with the view that it houses major portion of the protected area including the lagoon, flood plain and mangrove forest. Fifteen (15) residents were purposely sampled for the study. The criterion for identification was people

who have stayed in the areas for long and who have core community knowledge about the area.

The study adopted the qualitative approach and narrative design. During the field work, I explained the purpose of the study to the respondents, after seeking their consent; in-depth interviews were conducted with them by creating conditions necessary for them to express their views wholeheartedly. Aside this, observations were made. The data from the study was analysed using thematic analysis.

Keta Lagoon Complex Ramsar Site covers all or portions of Anloga District, South Tongu, Akatsi, Ketu and Keta municipalities of Volta Region (05.55N, 00.50E) enclosing at total area of 101,022.69 hectares (Forestry Commission of Ghana, 1999). Due to its ability to cover extensively large area of land composing the lagoon, flood plains and mangrove swamps, it is referred to as a complex ramsar site. It is noted for protecting migratory birds, the mangrove forest and breeding grounds of sea turtle. Keta Lagoon Complex Ramsar Site is one of few Ramsar sites in Ghana. Others include; Muni-Pomadze, Densu Delta, Sakumo, Songor and Owabi Wildlife Sanctuary Ramsar sites. The study areas are shown in Figure 1.

Figure 1. Study areas on the Keta Lagoon Complex Ramsar site
Source: Open Street Map



RESEARCH RESULTS AND DISCUSSIONS

Demographic characteristics of respondents interviewed

The age range of men and women interviewed ranged from 30 to 45 years. The highest level of educational attainment of respondents was Senior High School education. All of them work in the non-formal sector. Below are the analysis and discussion based on themes generated from the data:

Indiscriminate felling of mangroves and culture of replanting

All the residents I interviewed said that people in the area do engage in indiscriminate felling of mangroves for both commercial and personal purposes. Interview with respondents indicated that, there are some residents who engage in cutting and replanting of mangroves as work for livelihood. A participant said: *“my work is to pick up mangroves and plant them that is how I started it”*.

He further stated that but because *“for mangroves if you pick them you would have to plant them and later cut them for those who need it, I have built a canoe for such purpose”*. Further interview revealed that the so-called owners of such mangroves do engage the services of laborers (with maximum number of 10 people) for a week to cut down the mangroves for commercial purposes. Results from the study indicate that, there is indiscriminate felling of mangroves accompanied by a culture of replanting. However, the rate of cutting down of mangroves by residents does not resonate with the rate of replanting them. Thus, the rate of cutting down of mangroves exceeds the rate of replanting. The situation describes an intricate interplay of economic needs, traditional practices, and environmental concerns. While the culture of replanting is promising, commercial exploitation and indiscriminate cutting of mangroves raise concerns about the long-term health and viability of the Keta Lagoon Complex Ramsar Site. Balancing the economic interests of local neighbourhood with the need to safeguard and restore the vulnerable coastal habitat could be a challenging task.

The findings are in line with studies done Ghana in 2019 by Fiankor and Dodd, who found that, there is over exploitation of mangroves. According to Osei et al. (2011) wetland resources, such as mangroves are used and exploited without regulation in Ghana. Wetlands are dynamic areas open to influence from natural and human factors (Fiankor & Dodd, 2019). Therefore, to preserve biodiversity and productivity, a memorandum of understanding among owners, occupiers and interested bodies is very crucial (Ramsar Convention, 1998).

Refuse Dumping and Open Defecation

Interview with participants reveal that some residents engage in dumping refuse in the wetland area. A participant recounted: *“people do engage in dumping refuse here but it is not something that is alarming”*. Another participant also pointing at some refuse in the wetland said: *“these are some that you can see here. Sometimes it is not that people deliberately do it. The wind carries refuse produced during market days into the waters”*. The unintentional component in wind-driven refuse buildup emphasises the importance of strategic waste management

practices, such as provision of refuse bins in market at the vicinity of wetlands by districts authorities.

On the issue of open defecating near the wetland, it has been raised by the respondents to indicate that, households near the wetland at Anyanui and Tegbi engage in open defecation. However, they indicated that it is not something that is of worrisome concern. This calls for a proactive action towards the provision of toilet facilities to the residents in this area in order to avoid the escalation of the problem. The reported condition emphasises the significance of waste management and sanitation practices in the Keta Lagoon Complex Ramsar Site. While there is currently little concern about refuse dumping and open defecation, it is critical to recognise the possible long-term implications on the environment, water quality, and general ecosystem health. Various studies from wetland's environment in Ghana indicate that her environment is facing an ecological crisis (Fiankor & Dodd, 2019). Due to the fact that, wetland ecosystems are under intense human pressure that results in their degradation (Letsoalo & Potgieter, 2020).

Poaching

Interview data revealed that killing of turtles are common. The interviews further revealed that some residents do engage in killing crocodiles for food but a situation that is extremely rare. A participant at Anyanui said: *"I have seen one that was shot and killed for food but that was 10 years ago since then there hasn't been any"*. The situation of common turtle poaching and rare crocodile poaching emphasises the urgent necessity for conservation activities in the Keta Lagoon Complex Ramsar Site. By addressing the cultural, economic, and ecological components of poaching, it is feasible to establish a future in which the area's unique biodiversity is protected for future generations.

The use of machines and hiding of ecological habitants

The respondents in the study indicated that the use of machines have regulated the mobility of ecological animals within the enclave. It emerged from the study that, crocodiles and other ecological habitants were abundant and can be seen along the Ramsar site but due to the operations of machines, the noise have driven them to the deep enclaves of Salo and Agortoe that houses the Ramsar site. A participant I interviewed also recounted: *"it is my grandfather who told me stories concerning crocodiles and other animals within the wetland area during their fishing expedition but for me I have not seen any before"*.

The mobility of animals to deeper enclaves may impair the Ramsar Site's inherent ecological connection. Animals rely on specific habitats for feeding, reproducing, and other activities. The displacement produced by machine noise might result in habitat fragmentation, thereby harming the health of the ecosystem. Though the use of technology cannot be avoided, balancing human activities with ecological protection is critical for preserving the site's biodiversity and ensuring that future generations appreciate and coexist with the diverse natural environment.

The findings indicate how the Tragedy of the Commons theory is applicable to water resource management with respect to the Keta Lagoon Complex Ramsar Site. Though on a minimal level, the anthropogenic activities exemplify the Tragedy of the Commons' tenets of self-interest, lack of control, and exploitation of resources. Indiscriminate cutting of mangroves aligns with self-interest and profit seeking behaviour and inappropriate waste disposal shows degradation of the wetland ecosystem which is one of the arguments in the common's theory for unchecked resources.

CONCLUSION AND RECOMMENDATIONS

There is a moderate environmental challenge to Keta Lagoon Complex Ramsar site. Over exploitation of mangroves, the habit of open defecation, dumping of refuse in the enclave of the study areas and minimal poaching were identified. Therefore, advancing the protection and strategizing to achieve effective management of wetlands in Ghana is needed to ensure that ecosystem benefits inure to mankind.

Traditional chiefs should be given the mandate and be tasked to ensure rules and regulations regarding Ramsar sites are well respected. Wildlife division/forestry commission need to be more vibrant in ensuring that, wetlands are wisely used and protected from biodiversity loss and degradation. There is also the need to educate residents living along Ramsar sites on all matters relating to the use and protection of Ramsar sites in Ghana. Toilet facilities need to be provided along the banks of the Keta Lagoon Complex Ramsar Site.

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