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# The Management of Wetlands in Ghana as a Compliance to the Ramsar Convention

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## Abstract

The Government of Ghana recognizes the importance of wetlands as a habitat for wildlife, in the maintenance of the water table, mitigation of flood conditions, and water purification. Wetlands resources are also known to be of socio-economic importance and have been harvested for construction poles, fuel-wood, timber for furniture, and craftwork. Furthermore, wetlands are of importance as fishing, hunting, and grazing areas, and play an important role in crop production and domestic water supply.

For reasons of these memories and Ghana's wetland system is still facing threats such as mining, soil loss, wetland pollution and over exploitation of resources, the government of Ghana has rectified various conventions and implemented a series of policies in the country to ensure the management of wetlands of international importance. The national wetlands strategy was also developed as a way to manage and conserve wetlands in Ghana. Aside from the government's efforts to manage and conserve wetlands, the traditional communities in Ghana have adopted traditional ways of protecting these areas that are of enormous benefits to them.

Although the Ghanaian government has implemented a series of measures to protect the wetland ecosystem and made remarkable achievements, it still cannot completely solve the existing difficulties. Therefore, this study proposed some changes that can help solve these problems. First, the government establishes the legislative concept of giving priority to protection, focusing on restoration and sustainable utilization, and formulates a careful Wetland Legal System; Secondly, the government should formulate corresponding wetland conservation policy principles or plans and strengthen scientific and technological research to improve the level and quality of traditional wetland protection in Ghana; Thirdly, Ghana strengthens the protection of wetland through the establishment of wetland nature reserves; Finally, formulating relevant laws to improve the level of local wetland protection, the government could truly protect Ghana's wetland ecosystem.

To ensure that a quality study is completed, the researcher adopted a qualitative approach, where date is accessed from both primary and secondary sources in other to explore all the areas of vital concern to the management of wetlands in Ghana.

**Keywords**: Ramsar site Conservation; National Wetlands Strategy; Wetlands Legislations; Wetland Management

## Introduction

This chapter of the paper gives readers the chance to have an overview of the study that is by giving a brief highlight of the sources and background of the study also includes the objectives and methods used to arrive at this paper. Wetlands though not given much concern by developing countries whiles focusing on tackling poverty and deceases should be given a second look at, since it can offer developing countries like Ghana many opportunities.

## Research Background

Wetlands are fragile ecosystems in the context of self-sustainability, sensitivity, and ability to cope with natural and human-caused negative impacts. Those negative factors can easily cause habitat alterations, fragmentations, changes in species abundance and composition [1,2]. Nowadays, these complex and sensitive natural ecosystems are rare and endangered. Wetlands are one of the two types of the most endangered ecosystems in the world (Smart, 1997). This calls for effective and efficient measures to be taken in managing and conserving this highly threaten ecosystem.

The Convention on Wetlands of International Importance, especially as Waterfowl Habitat, also known as the Ramsar Convention (1971), is the only global convention1 that is related to these particular sorts of habitats and recognizes the value of wetlands and their resources. The Ramsar Convention represents "an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources." Member nations which Ghana is a party are therefore obliged to comply with the terms and mandate of the convention, and this calls for a study on how Ghana, a party to this convention complies with its principles and objectives at the national and local levels.

To ensure the judicious use wetlands and other natural resources, the Ministry of Lands and Forestry launched the National Land Policy in June 1999. The policy recognizes wetlands as environmental conservation areas and precludes the following practices: Physical draining of wetland water, draining of streams and watercourses feeding the wetland, Human settlements and their related infrastructural developments in wetlands, Disposal of solid waste and effluents in wetlands, Mining in wetlands.

The policy also seeks to promote the use of wetlands for farming, grazing, fishing, timber production and salt-winning provided that such uses also serve to conserve the ecosystem, biodiversity, and sustainable productivity of the wetlands.

Aside from this policy to integrate wetlands issues into national land-use planning and decision making in other sectors of the Ghanaian economy, the Ministry of Lands and Forestry has, in consultation with key stakeholders, prepared this document, Managing Ghana's Wetlands: A National Wetlands Conservation Strategy to promote the participation of the local communities and other stakeholders in the sound management and sustainable utilization of Ghana's wetlands and their resources. Upon these policies, wetlands in Ghana are still greatly threatened in several ways.

This paper explores the management of wetlands in Ghana as an enforcement of the Ramsar convention which Ghana is a signatory. Ghana's wetlands are an environmentally rich resource that provides thousands of migratory and resident birds graze, roost, and nest there; marine turtles; many species of fish; plant genetic resources for research; and a key source of revenue for particularly poor populations [3].

Wetland ecosystems are found throughout the country and account for around 10% of the country's total land surface. Ghana's 550-kilometer coastline is dotted with more than 50 lagoons and estuaries [3].

## Research Objectives

The purpose of this study is to find out the effectiveness of Ghana's national wetlands policy and future legislation. The following research objectives will be used to accomplish this:

To assess the measures adopted by Ghana in the conservation and management of wetlands in its territories.
To identify threats to wetlands in Ghana.
To identify laws, policies, and strategies used by Ghana in managing wetlands.
To suggest recommendation for effective management and conservation of wetlands in Ghana.

### A brief overview of the Ramsar Convention

International environmental treaties are legal instruments that bind numerous countries together to achieve a common environmental goal. The Ramsar Convention (1971) is one of the earliest of these international accords, and it was the first to focus on the preservation of a specific ecosystem type. It ushered in a slew of conservation-focused international accords, including the World Heritage Convention (1972) and the Convention on Migratory Species (1973).

The creation of Ramsar was the culmination of a long process to reach universal agreement and build an overarching legislative framework to safeguard waterfowl habitat around the world.

Non-government conservation organizations were the driving force behind it. Political differences among the country signatories, particularly the key Cold War players in Europe, delayed the signing of the Convention significantly.

The International Union for Conservation of Nature (IUCN) was asked to house the Convention's office, partly to assure neutrality and partly owing to financial restrictions. Two traits were embedded in the Convention's conceptual development as a result of this historical foundation.

First and foremost, a conservation strategy centred on protected areas was critical. Second, the Convention's vision included unwavering respect for 'national sovereignty.' Three conceptual pillars underpin the Ramsar framework: (1) Ramsar site identification and administration; (2) responsible use of wetlands; and (3) international cooperation.

Despite its conservation-focused beginnings in 1971, the Convention has gone through several major revisions. Site selection and management of wetlands (the 1970s) The Ramsar framework's initial focus was on designating 'internationally important wetlands' in signing Parties' territories and providing them with 'protected-area' status under national legislation (Article 2.4 of the Convention text).

The treaty required the preservation of the specific ecological state (referred to as an "ecological character" in Ramsar parlance) identified at the time of designation. To do this, wetlands inventorying, monitoring, and impact assessments became critical activities, and detailed guidelines were developed in these areas.

Wise use and a commitment to national policy reform (the 1980s) By the early 1980s, the Convention's focus on waterfowl protection had faded, and a new emphasis on "wise use of wetlands" (Article 3.2) had gained traction. The World Conservation Strategy (1980) and the rising worldwide discourse on environment and development shaped this conceptual development significantly. As more impoverished countries attended the meeting, the notion of "smart usage" gained traction.

The phrase 'wise use' is defined as the sustainable usage of wetlands for the benefit of humanity in a way that is compatible with the preservation of the ecosystem's natural qualities.

The Parties to the Convention, on the other hand, might and did adopt more flexible definitions. By the late 1980s, the Convention's focus had shifted from 'designated wetlands' to all wetlands within a Party's territory. However, the nations were represented in the Convention by politically weaker environmental or conservation agencies (national implementing bodies), which did not necessarily have a mandate over comprehensive land management and land-use planning.

As a result, Ramsar urged the Parties to develop national wetland policies and conduct policy reviews in order to remove legal and institutional barriers to wetland protection (e.g., Ramsar Resolution VII.6 and VII.7 of 1999).

National wetland policies began to gain steam in the late 1990s, albeit some of these policy pronouncements have been slow to be implemented in practice (Hettiarachchi et al., [5]. The value of wetlands, ecosystem services, and human well-being (the 1990s and 2000s) The term "ecosystem services" became popular in Ramsar discussions in the late 1990s.

The Convention was a prominent collaborator in the Millennium Ecosystem Assessment project (2001–2005), and through Resolutions X.3 (the Chowgon Declaration) and X.18 (made in 2008), the project's recommendations were formally implemented.

The need to evaluate and protect wetlands' ecological services and their consequences for human well-being became a major foundation of the Convention's 2009–2015 Strategic Plan. Wetlands have a variety of social, cultural, and economic values, according to the Convention. It produced guidelines on economic [20] and cultural (Papayannis and Pritchard, 2008) values and valuation methodologies, with an emphasis on economic valuation throughout.

Partnerships, participation, and awareness (the 2000s) Stakeholder/community involvement in wetlands management is another concept that has garnered a lot of support in the Ramsar debate. Local and indigenous groups were involved, as well as environmental awareness-building and public-private collaborations.

This was in keeping with the conservation community's general trend toward participatory techniques (particularly within the IUCN), which was hastened by the Convention's shift toward "ecosystem services-based management."

Resolutions VII.8 and X.8 governed the 2009–2015 Ramsar Strategic Plan, which emphasized the importance of community engagement and partnerships. However, it should be emphasized that the majority of the Ramsar standards' recommended involvement instruments are limited to minimal degrees of local community participation rather than complete empowerment.

New developments in Ramsar and urban wetlands Resolution X.27 (2008), a spin-off of the Curitiba Declaration on Cities and Biodiversity, was the Convention's first official acknowledgment of the importance of urban wetlands (2007). Resolution XI.11, issued in 2012, provided a complete declaration on urban wetlands. The resolution established four broad principles of urban wetland governance, as well as five practical management principles: (1) wetland protection, (2) wetland restoration and creation, (3) appreciating the importance of wetlands, (4) stakeholder participation, and (5) integrated planning.

## Materials and Methods

Mainly qualitative data was employed to complete this study. Primary and secondary data sources such as books, journal articles, convention texts, etc., are accessible on Westlaw, Hein online, google scholar, Springer, Science direct, and relevant governmental documents.

The conduct of this study is also an exploratory research design that is meant to explore and answer hidden questions and trends in a research problem as to how, why, and what.

The study adopts an exploratory research strategy that is aimed at knowing more about the phenomenon of the wetlands management in Ghana as a compliance to the Ramsar convention. With this methodology being used in the study, all necessary answers to the research will be explored to give an in-depth understanding to readers and future policymakers.

## Results

### Ghana's Wetlands and its Management

This chapter gives in-depth understanding pertaining to this study that gives a clear picture of the state of wetlands from the national perspective, and discusses the wetlands conservation strategy of Ghana. Also, taking into consideration how wetlands are managed in Ghana and the various policies and legislations on wetlands management in Ghana.

The state of Ghana's wetlands Since 1988, Ghana has been a party to the Ramsar Convention, an international treaty aimed at the conservation of internationally significant wetlands. The execution of the principle of "smart use" of the wetland's resources, defined as "their sustained usage for the benefit of humanity in a fashion compatible with, the protection of the natural features of the ecosystem," is a major requirement under the convention. The convention's contracting parties must also incorporate wetlands protection issues into their national land-use planning plans. (Forest and Wildlife Policy in Ghana 2012).

Thousands of migratory and resident birds, marine turtles, many species of fish, plant genetic materials for research, and a substantial source of revenue for notably poor communities rely on Ghana's wetlands [3].

Wetland ecosystems are found throughout the country and account for around 10% of the country's total land surface. Ghana's 550-kilometer coastline is dotted with more than 50 lagoons and estuaries [3].

### Types of wetlands in Ghana

Two basic scientifically based and comprehensive wetlands classification systems have been developed for wetlands inventory and management, according to [6].

The first was created for the US government by Cowardin and his co-worker, while the second was adopted by the Conference of Wetlands. Wetlands are classified into five categories under the Cowardin system, "marine, estuarine, riverine, lacustrine, and palustrine"[7]. The hydrologic, geomorphic, chemical, vegetation, and biological characteristics that exist in the area where the wetland is located are used to classify it (Neubauer, 2008).

The Cowardin system of classification organized wetlands into the hierarchy of structures and recognized deep-water habitats but did not include many wetlands that have resulted from human activities [8].

To eliminate confusion, the Conference of Wetlands adopted the Ramsar Classification System for Wetland Type in 1990, which was changed in 1996. Approved by recommendation 4.7 and amended by resolution VI.5, the Conventions on Wetlands adopted the Ramsar Classification System for Wetland Type in 1990[29].

Three broad identified habitats were recognized as; Marine or Coastal wetlands, Inland wetlands, and Man-made wetlands and subdivisions totalling 40 wetland types [8].

Wetland ecosystems in Ghana account for around 10% of the country's total land area. In Ghana, three main types of wetlands have been defined based on the Ramsar Convention's criteria.

## These are the following:

Marine/Coastal: these are mostly saltwater ecosystems that are linked to flood plains of large rivers' estuaries and water sources (Neubauer, 2008). The majority of the wetlands in Ghana's coastal zone is saltwater habitats. They are mostly found in flood plains of big rivers and watercourses' estuaries.

The open shores that are not influenced by river water, as well as lagoon systems, are examples of marine wetlands. It includes maritime waters with a depth of no more than six meters at low tide. Areas like the sandy beaches and shallow waves along the Brenu Akyim coastline in the Central Region are examples of this. Forest and Wildlife Policy in Ghana [34].

Inland: Are primarily freshwater ecosystems in which water from the ground, surface springs, or rain causes soil to become saturated with water either permanently or seasonally [17]. Freshwater ecosystems predominate in inland waters. They occur anywhere when groundwater, surface springs, streams, or run-off generate saturated soils, frequent floods, or the formation of temporary and/or permanent shallow water bodies. The following items are included: Densu, Afram, Oti, and Ankobra are permanent rivers/streams; Bosumtwi has a permanent freshwater lake; Amansuri has a freshwater swamp forest; and the Black, Red, and White Volta have freshwater marshes. Freshwater wetlands, particularly freshwater marshes, are the most common and important in the world. This is the most comprehensive in Ghana, as it includes all-natural drainage systems. Forest and Wildlife Policy in Ghana [34].

Man-made: Wetlands have been built for aquaculture, agriculture, salt exploration, and water storage, among other purposes. Man-made or artificial wetlands are divided into four categories under the Ramsar Convention.

These are wetlands that have been built for aquaculture, agriculture, salt extraction, water storage, and urban/industrial use. The following is an example of this in Ghana: Salt Pans at Elmina Salt Pans, Songor, Densu Delta Reservoirs at Volta Lake, Kpong head pond, Brimsu reservoir Urban/Industrial at Tema Sewerage Treatment Plant.

## Ramsar Sites in Ghana

Ghana is blessed with the following Ramsar Site covering its land area and contributing greatly to both its social and economic life: One of these sites is the Muni-Pomadze Ramsar Site, which is located in the Awutu/Efutu/Senya and Gomoa Districts of Ghana's Central Region (05.23N, 00.40W) and covers 9,461.12 hectares, whiles Densu Delta Ramsar Site, 11 kilometers west of Accra (05.30N, 00.15W), covers 5,892.99 hectares, the famous Sakumo Ramsar Site, which covers 1,364.35 hectares and is located west of Tema (05.30N, 008W).

The other sites are Songor Ramsar Site, which covers 51,133.33 hectares and is located in the Greater Accra Region's Dangbe-East region (06.50N, 00.30E), the Keta Lagoon Complex Ramsar Site encompasses all or parts of the Volta Region's South Tongu, Akatsi, Ketu, and Keta districts (05.55N, 00.50E); the entire area is 101,022.69 hectares and Ramsar Site for the inland Owabi Wildlife Sanctuary, with a total area of 1,310 hectares, is located around 14 kilometers north-west of Kumasi in the Ashanti Region, Ghana's Ramsar Regulation (1999).


**Figure 1:** Wetlands Management in Ghana

Wetlands were once thought to be a wasteland, but they have recently come to be recognized as essential landscape elements that provide a variety of benefits to people, fish, and animals. The intrinsic and distinctive natural qualities of wetlands are responsible for the valuable benefits they provide to societies around the world [14].

According to[6], for wetlands inventory and management, two main scientifically based and comprehensive wetlands classification systems have been developed. Cowardin and his co-worker created the first for the US government, and the Conference of Wetlands adopted the second. The Cowardin system generally categorizes wetlands into five main types: Marine, Estuarine, Riverine, Lacustrine, and Palustrine [7].

This classification is based on the hydrologic, geomorphic, chemical, vegetation, and biological factors prevailing at the area where the wetland is located.

The Cowardin system of classification organized wetlands into the hierarchy of structures and recognized deep-water habitats but did not include many wetlands that have resulted from human activities [8].

To eliminate confusion, the Conference of Wetlands adopted the Ramsar Classification System for Wetland Type in 1990, which was changed in 1996. It was endorsed by suggestion 4.7 and amended by resolution VI.5 [29].

Marine or Coastal wetlands, Inland wetlands, and Man-made wetlands were defined as three major habitat types with a total of 40 wetland kinds [8].

## Traditional Management Practices in Ghana

Integration of Traditional Ecological Knowledge (TEK) or customary practices, and beliefs in conservation projects has emerged as a significant determinant of conservation success (Brooks et al. 2012). Studies all over the world have shown the significance of customary practices in resource management and conservation [10].

Rural communities' livelihoods in sub-Saharan Africa are heavily dependent on the land and its resources [11].

In order to ensure the sustainability of these resources, there is the need to ensure their conservation. The role of traditional beliefs system in the conservation of natural resources is very significant for their management.

The use of traditional beliefs in the conservation of a large number of elements of local biodiversity, regardless of their use value, dates back to creation [12].

In Ghana most wetlands and their resources have been managed and regulated in the past through varied traditional practices, depending on the beliefs of the traditional area that claims ownership. These traditional practices involve customary laws or taboos, which determine rights to land and resource use.

They include the enforcement of sanctions for violation by the responsible authority. Many wetlands have cultural heritage value, Sakumo lagoon, for instance is regarded as the abode of "gods" [13]. Traditionally these wetlands are protected and managed using varied ways depending on the communities that they are located.

## Policies and laws on wetlands management in Ghana

Ghana, as a signatory to the Ramsar convention, has developed a set of national and local policies to aid in the management of wetlands under its authority, as specified by the Ramsar convention for all members nations.

## Wetland's policy of Ghana 1999

Ghana's Wetlands Policy, adopted in 1999, recognizes wetlands as a valuable natural resource and seeks to ensure their wise use for the benefit of the country and its people, both now and in the future, with the goals of promoting sound management and sustainable utilization, preserving the ecological and life-support functions of wetlands, and ensuring that Ghanaians are aware of the importance of wetlands and are committed to their conservation [13].

Fisheries Law, Environmental Policy, Wildlife and Forestry, Land Policy, and the Water Resources Commission Act are some of the other policies that have been passed into legislation that has an impact on wetland utilization (522).

The country has also enacted and implemented legislation to safeguard the environment in general, which includes wetlands and water resources, with the following examples;

## The constitution of Ghana

All citizens (workers and employers) must conserve and safeguard the natural environment of the Republic of Ghana waterways, according to Article 41(k) of Chapter 6 of the Ghanaian constitution. This means that wetlands, as part of the natural environment, should be conserved as well.

## Environment legislation

The Environmental Protection Act (Act 490 of 1994) establishes the Environmental Protection Agency's power, responsibilities, organization, and funding. Part I of the Act entrusts the Environmental Protection Agency (EPA) with the design of environmental policy, the issuance of environmental licenses, and the issuance of pollution abatement notifications that contain standards and guidelines.

The Environmental Protection Agency (EPA) is regarded as the parent agency in the responsibility of all environmental matters. Even though the EPA did not separate the various sectors, it protects all environmental issues, including wetlands.

## Fisheries Act

To consolidate and modernize the law on fisheries, the Fisheries Act (Act 625 of 2002) repeals the Fisheries Commission Act (Act 457 of 1993). The Act regulates, manages, and develops fisheries while also encouraging the sustainable usage of fisheries resources.

For instance, Section 91 permits the creation of marine reserves and prohibits fishing, dredging, and removal of sand or gravel, as well as disruption of the natural environment, without the minister's consent, whiles Section 92 makes it illegal to pollute water in such a way that it harms aquatic resources, and it spells out the consequences.

This law applies to both wetlands and high seas fish. In line with this Act fisheries in wetlands are well regulated and managed in other to ensure sustainable utilization of wetlands resources.

In summary, from this chapter one can attest that Ghana as a country as tried and put measures in place to manage the various wetlands within its jurisdiction, though there is still the need for more improvement since wetlands management does not only require policies on papers or documents but the actualization of these policies.

## The Enforcement of Ramsar Convention in Ghana

Ghana, as a country with a high spirit in the conservation of wetlands, adopted various mechanisms in enforcing the Ramsar Convention in Ghana. The enforcement is done using national regulations on wetlands, through national institutions, and also through traditional enforcement mechanisms; some of these mechanisms are below:

## Wetland management (Ramsar Sites) regulations 1999

This regulation sets up various measures for the enforcement of the Ramsar Convention in Ghana; this involves the following:

Whereas, on February 22, 1988, the instrument of accession to the Convention on Wetlands of International Importance, Particularly as Waterfowl Habitat, was approved at Ramsar, Iran, on February 2, 1971, was deposited at the UNESCO Headquarters in Paris. And whereas, on the 22nd of June 1988, the Convention became effective for Ghana. As a result, these regulations were made on the 19th day of August 1999, by the authorities granted to the Minister responsible for Forestry by section 11 of the Wild Animals Preservation Act 1961 (Act 43). Ramsar site Regulations (1999).

## Minister to designate areas for specific activities

In section four of the regulation, the Minister is given the following powers to ensure the enforcement of the Ramsar Convention in Ghana. For instance, (1) The Minister may, if necessary, approve the areas in the Ramsar Site where operations such as sand quarrying or soil removal may be carried out by publishing a notice in the Gazette or through the mass media.

(2) The Executive Director or his authorized agent may designate where litter may be dumped in a Ramsar Site through community education or physical marking.

Section five (1); A District Assembly in a Ramsar Site may impose custodial and customary conservation practices that are compatible with the Ramsar Convention and permitted under these Regulations by bye-law, in collaboration with the Minister.

(1) A District Assembly in a Ramsar Site, in agreement with the Minister, may impose custodial and customary conservation measures that are compatible with the Ramsar Convention and approved by bye-law under these Regulations.

(2) The Executive Director or his authorized representative shall determine: (a) the types of wise use activities that may be permitted in a core area of a Ramsar Site for its sustainable use; and (b) the conditions under which the approved wise use activities in a Ramsar Site may be carried out to sustain the utilization of the resources in consultation with the committee of the District Assembly responsible for the environment and natural resources. (3) The committee may designate how the public will be informed about the wise use actions, such as by gong-gong or any other method it considers acceptable. (4) The Executive Director or his authorized representative must approve the activities listed in sub-regulation in writing (2) (5) Subject to sub-regulation (2), written clearance per sub-regulation (4) must be sought before any activity in a Ramsar Site can begin. (6) No physical development is permitted within a Ramsar Site's core region.

Sixth section: Prohibited activities, within a Ramsar Site, no one shall: (a) pollute any water; (b) use poison, chemicals, explosives, or any other prohibited fishing method; (c) employ seine nets or other nets with mesh sizes of less than 25mm; (d) fish during the closed season; or (e) participate in any other behaviour that harms the environment or is likely to harm the environment.

Restricted activities (section 7): (1) No person shall (a) remove any woody vegetation or cultivate any portion of a core area unless the Executive Director or his authorized representative has given written consent in consultation with the relevant committee; and (b) remove any woody vegetation or cultivate any portion of a core area unless the Executive Director or his authorized representative has given written consent in consultation with the relevant committee.

(b) deposit any litter in areas designated under these Regulations; (c) win sand, quarry, or remove soil unless areas approved by the Minister in writing; (d) hunt, capture, harm, or intentionally disturb a Ramsar Site (e) enable grazing sheep to graze within a core area without being overseen by a herdsman during breeding seasons; f) allow grazing livestock unsupervised by a herdsman in and around bird nesting locations identified by the Executive Director or his authorized representative during nesting periods. (2) No individual shall ignite a bush fire within 1km of a Ramsar Site's perimeter or allow grazing livestock to damage vegetation or wade through a core region in such a way as to adversely affect the environment, or perform any other act that disturbs the ecosystem.

(3) In a Ramsar Site, no person should engage in any activity that has or is likely to harm any animal or species or the environment. Section eight: Offences (1) Anyone who violates any provision of these regulations or a direction issued under these regulations commits an offense and faces the following penalties if found guilty on summary conviction: (a) a fine of not more than $100,000.00 and not less than $50,000.00 for a first offense, or a term of imprisonment of not more than fourteen months, or both; (b) a fine of not more than $500,000.00 and not less than 200,000.00 for a second offense, or a sentence of not more than fourteen months in prison, or both; (2) In the instance of a continuing offense, a person is subject to a fine of not more than $50,000.00 on summary conviction for each day the offense continues.

(3) Notwithstanding sub-regulations (1) and (2), anybody who violates any provision of these regulations or directives made under these Regulations while exploiting a natural resource or engaging in any commercial activity is guilty of committing a crime and is punishable by summary conviction. (a) for a first offense, a fine of not more than $2,000 or a period of imprisonment of not more than 6 months, or both; (b) for a second offense, a fine of not more than $5,000,000.00 or c) for a continuing crime, an additional penalty of not more than $100,000.00 for each day the offense continues. (4) An offender guilty of causing environmental damage must pay the cost of environmental rehabilitation as determined by the court. (5) The court may consult the Environmental Protection Agency to estimate the cost of environmental rehabilitation under sub-regulation (4).

Section nine: Power of seizure (1) Any equipment, tools, apparatus, or articles used in violation of these Regulations must be seized by a police officer who receives an arrested person from a private person. (2) If a person is found guilty of breaching these Regulations, a court may order the confiscation of any equipment, tools, apparatus, or objects used in the violation, with the materials being released to the Executive Director.

### Institutions for the enforcement of the Ramsar Convention in Ghana

Government and non-governmental institutions that enforce the law include the District and Metropolitan Assemblies, the Ministry of Food and Agriculture, the Survey and Meteorological Services Department, the Ministry of Lands and Forestry, the Forestry Department, universities, the Council for Scientific and Industrial Research (CSIR), and the National Geographic Society (NGS).

The proposed development of the Centre for African Wetlands Management, which will coordinate wetlands research throughout the West African sub-region and be based in Ghana, is one such project. Ghana is doing all of these things and more to protect her wonderful wetlands and preserve their ecological, cultural, recreational, and aesthetic values. Ghana's beautiful wetlands are a must-see for anybody visiting the country (2018).

The wetlands strategies and policies developed by Ghana have to extend helped in the management and conservation of wetlands, though the wetlands in the country are still under great threats, one can factually say that these legislation needs to be amended to meet current needs and also needs to be effectively implemented and enforced by the relevant institutions in charge.

## Discussion

This section of the paper is dedicated to the discuss key results of wetlands management in Ghana, during the study it the benefits and threats of wetlands in Ghana was given greater attention. These results are discussed below, also taken in consideration measures adopted in other countries.

### Benefits of wetlands in Ghana

Introduction Wetlands were often thought to be a wasteland, but they have recently been recognized as important landscape elements that give major benefits to people, fish, and animals. The intrinsic and distinctive natural qualities of wetlands result in the beneficial services that are valued by societies all over the world [14].

For many years, Ghana has benefited greatly from its products and functions. The following are some of the benefits as outlined in Ghana's national wetlands policy:

Maintaining water table; Wetlands enable the movement of large volumes of water into the underground aquifers, resulting in the recharge of the water table.

This process maintains a high-water table, supports healthy plant growth, and may also be drawn for human consumption and industrial activities.

Purification of Water; Surface run-off is cleaned by wetlands, which remove sediments, nutrients, poisonous chemicals, and other contaminants. This enhances water quality and prevents downstream watercourses from becoming silted.

**Figure 2**

They filter away silt, decompose vegetative waste, and transform chemicals into useable forms to clean water [18].

The Wetlands as a Habitat; The discovery of rare plant species, such as orchids, and essential endangered fauna, such as shorebirds like the piping plover, emerged from studies of bogs conducted in the 1970s and 1980s [35]. Birds, animals, reptiles, amphibians, fish, and invertebrates all make their homes in Ghana's wetlands.

Salt marshes are well-known duck habitats, and nesting birds such as ospreys and herons eat both freshwater and saltwater wetland species [19].

Controlling of Flood and Erosion; Wetlands keep surface run-off from moving too quickly and overflowing the river banks downstream, causing erosive flooding. Wetlands help to reduce flood peaks by temporarily retaining water and decreasing the water's pace.

Plant-based items; Mangroves and other wood products were traditionally utilized for firewood, timber, medicine, and other purposes. Supply of Water Wetlands supply clean and dependable water for human use, agriculture, and industry because of their ability to cleanse and retain vast volumes of water. Many rivers run all year because wetlands, such as our rain forest, gently release stored water into them, extending the duration when water is available during dry periods. As a result, wetlands are critical to the long-term health of rivers and streams.

Agricultural Resources; Wetlands serve as crucial agricultural land for the growth of rice, which is the staple meal for more than half of mankind due to its rich source of decomposed organic matter and continual water recharge (Adanus,1993). Palm oil from African wetlands is also useful for cooking and soap manufacturing (De Steven & Lowrance, 2011). Wetlands play an important role in the hydrological and chemical cycles, as well as supporting large food webs and biodiversity [20].

Wetland since Ghana's rectification of the Ramsar convention have provided numerous benefits to household in the form of food, fish, income and building materials, and at the national level global acknowledgement in promoting environmental protection and enforcing the sustainable development goals. Besides these benefits are great threats to the existence of these fragile ecosystems by households and industries.

## The Threats to Wetlands in Ghana.

Over the years, human activities and disturbance have resulted in the loss of wetlands, affecting their value and function. Direct impacts on wetland occur as a result of activities or disturbances occurring within the wetland. Indirect impacts occur as a result of activities or disturbances occurring outside of the wetland. The removal of vegetation, construction of buildings, roads, and bridges, and changes in water levels and drainage patterns are all examples of direct impacts [21].

The wetlands in Ghana form an important ecological resource such as providing food, roosting grounds, and nesting sites for many for migratory and territorial birds, marine species, and many other plant genetic materials for research and a major source of income for especially poor communities from agriculture activities, salt mining and other economic activities [3].

Though many efforts through policy formulation and legislation have been put in place to stop or minimize the threats, Ghana's wetlands still face various threats. Some of these threats are as follows;

Mining Surface mining; which was originally considered minor harm to wetlands but is now a severe threat to inland wetlands vegetation and hydrology due to plant clearance, erosion, sedimentation, and the loss of water bodies, has become a national concern (EPA-Ghana, 2008). Birim River, River Pra, Volta, and Ankobra are among the water bodies that supply water to the afflicted wetlands.

**Figure 3**

Decomposition of the soil; Mangroves and other forested coast areas serve as windbreaks and help to reduce the impact of coastal storm surges, as noted by Ntiamoah-Baidu and Gordon (1991), but due to the lack of such natural protective wetlands systems, a large portion of Ghana's eastern shoreline, particularly at Keta and Ada, is vulnerable to storm surge and serious erosion.

Pollution; Although wetlands can absorb pollutants from surface water, their capacity is limited. Sediments, fertilizers, humus sewage, animal waste, road salt particles, heavy metals, and hydrocarbons are the main contaminants that cause wetlands to degrade [17].

Among the Dansu delta, Mumi lagoon, Anlo-Keta lagoon, and Sakumo lagoon, the Songor Ramsar site is the second largest in the country. However, a walk around the Songor Ramsar site reveals the construction of homes. The vegetation in and around the Songor site has been devastated, and a portion of the lagoon has been filled with solid waste, resulting in flood and storm attacks on the villages surrounding the site in recent years [3].

Over-Exploitation; People migrate into wetland areas during Ghana's dry seasons, resulting in over-exploitation of wetland resources such as cattle grazing, fuelwood, timber, water abstraction, and fisheries.

**Figure 4**

People living near the Sakumo wetland fish and farm on the marshes during the dry seasons, and cut down mangrove and other trees found along the borders and in the swamp for fuelwood, according to an evaluation of the state of the Sakumo wetland (EPA-Ghana, 2008).

Wood carving activities, illegal and unsustainable logging techniques, slash and bush farming, and poaching or bush-meat hunting are all contributing to the loss of biodiversity in Ghana's inland wetlands [22].

Despite laws being passed and treaties being amended, Ghana's wetlands and resources continue to face several dangers, which harm not just the wetlands and their resources but also the people who live near them and rely on them for their livelihood. This now necessitated the formulation of regulations that target only wetlands sustainability.

## Key Findings

From the study it was realized that some wetland conservation policy principles are not practice in Ghana which are;

No further loss of wetlands - any further losses may exceptionally only be admitted for imperative reasons of public interest and must, in any case, be compensated by the restoration of former wetlands or the creation of new wetlands of at least the same surface and at least performing the same functions and providing the same ecological values.

No further wetland degradation - current wetlands must at least continue to perform their present functions and to provide their present ecological values. Where functions and values cannot be maintained at the present level, compensation has to be provided as far as possible on the same wetland type, either in the wetland concerned or through the improvement, restoration, or creation of adjacent or nearby wetlands.

Wetland improvement and restoration - existing wetlands should be improved and former wetlands restored as far as is feasible with a view to providing the best level of wetland function and value. Restoration should have priority over creation.

Establishing wetland nature reserves is the most powerful measure to conserve natural wetland and its biodiversity. These principles, if effectively adopted and enforced in Ghana, would improve wetlands management and conservation.

## Recommendation

After researching both primary and secondary data, the researcher proposed the following recommendations which is believed to help in the effective management of wetlands in Ghana as an enforcement of the Ramsar convention on wetlands. Some of these recommendations comes from lessons from how wetlands are managed by other nations which are also parties to the convention. This is because the study found out that wetlands in Ghana are still threaten by human activities.

Sustainable exploitation of wetlands in Ghana, this will prevent issues of inter- generational imbalances of these resources, this can be achieved by adding sustainability plan to future wetland legislations. Considering the absence of a wetland's sustainability plan, in other to ensure that the wetlands in Ghana are protected for the future generations to also benefit from them, future legislations should include wetland sustainability measures in enactment of legislations. Factors such as replacement of damaged wetlands sites, introducing fish farming in wetlands, community sensitization on the importance of wetlands, identification of new wetlands, should be of a great concern in other to sustain wetlands in the country for future generations.

Scientific research and development in the areas of indigenous traditional management practices in wetlands conservation and protection in Ghana. This research which will enable the country to unearth all hidden traditional practices that will contribute greatly to wetlands conservations and management this should be added in future wetland management legislations of Ghana. Scientific research and development in the areas of ingenious traditional management practices will give the country an idea as to develop mechanisms that will be accepted by the citizens of the various localities. For ages indigenous knowledge has been used in the protection of natural resources in Ghana and if considered in the management of wetlands, there will be great improvement in the conditions of wetlands.

Increasing the scope of the strategic objectives of Ghana's Wetlands conservation strategy to include sharing and adoption of knowledge and information from members countries of the convention on wetlands. This if successful will provide a pool of knowledge and information on the management of Wetlands for Ghana and other countries. Wetland's information share will help Ghana a lot if that option is considered in future legislation. This will give Ghana the opportunity to learn from other countries and adopt better measures in managing its wetlands.

Ghana can learn from Europe's wetland conservation policy principles which state that; No further loss of wetlands - any further losses may exceptionally only be admitted for imperative reasons of public interest and must, in any case, be compensated by the restoration of former wetlands or the creation of new wetlands of at least the same surface and at least performing the same functions and providing the same ecological values.

Ghana can also learn from China by establishing wetland nature reserves which is the most powerful measure in China to conserve natural wetland and its biodiversity. This enlightenment will help conserve its fragile wetlands for generations. Parks and reserves are also ways other countries conserve their wetlands. Ghana in its future legislations can try to enact an Act on conserving some wetlands by making the reserves just like other natural reserves in the country and through this, citizen will be afraid to destroy these reserves.

Future wetland legislations in Ghana should effectively introduce decentralization of wetlands management from the national to the local areas of the country and equip the institutions at these levels with material and technical resources to enforce the legislation.

This decentralization should look input administrative decentralization, that is the division of wetland matters among the various administration or work units in the country from the national to the local level of governance to enough that all units have a fair knowledge about matters relating to wetlands in the country.

Secondly, financial decentralization, the government should ensure that funds are given to all the levels of governance to ensure then undertake proper management of their wetlands. These funds will enable them undertake research, education and development of effective plans to conserve wetlands from the national to local levels.

Thirdly, legislative decentralization, the power to enact Bye-laws by the various districts should be encourage in Ghana, this will best help protect the wetlands in the various district. Such Bye-laws too should be regulated so as to be in line will the national legislations on wetlands.

In addition, the government should consider introducing marketing-based legislation to protect wetlands in Ghana. When it is impossible or impractical to avoid or minimize an adverse impact on a wetland caused by a discharge, such as dredging or filling a wetland, compensatory mitigation is the most effective policy option. Mitigation might take three different forms.

Banks for Mitigation. The applicant for a discharge permit purchases credits from a mitigation bank in this market-based method. The "bank" is usually a different wetland that has been restored, renovated, or developed by a state or local government agency or a charitable organization land capable of being transformed to a wetland through revegetation or hydrologic alterations, or a conservation organization.

In lieu of payment, there is a fee. A permit applicant may make a payment to a government agency or non-profit conservation group that will restore, enhance, or build wetlands elsewhere instead of acquiring wetland credits from a bank. The permitting agency determines the amount of the in-lieu fee based on the mitigation activities required to mitigate the project's impact.

Mitigation on-site. The requirement that the permit applicant execute wetland restoration efforts to offset the discharge impact on the wetland is an alternative to these market- based procedures. The operations could take place on-site by restoring wetland functions in the same region, on adjacent land, or at a different location with comparable wetland values. If the actions are carried out within the same watershed, the mitigation is more likely to lessen the consequences in the impacted wetland. The permit applicant is responsible for ensuring that mitigation activities are accomplished under this strategy.

## Conclusion

The study undertaken management of wetlands in Ghana as an enforcement of the Ramsar convention reveals that Wetlands management is of great importance from international to the local levels, this is not just for the benefits wetlands provide for humanity directly but also for the indirect benefits provided by wetlands.

Though wetlands provide these benefits, it is also seen that wetlands face a series of threat that threatens their survival. Some of these threats are pollution, degradation, overexploitation, and many more.

These threats, therefore, cause the government of Ghana to rectify international agreements to conserve wetlands and also formulate and implement many environmentally-friendly policies in the country to ensure the management and conservation of wetlands of international importance as recommended by the Ramsar Convention.

At the traditional level, community members also adopted a series of customs and traditions to preserve and manage Wetlands within their localities. From these measures adopted in Ghana, one can conclude that wetlands are managed well in Ghana though there are still some improvements to be undertaken to ensure complete, effective, and efficient management of these areas of national and international importance and also improving upon future legislations on wetlands.

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